

Growth in commodity investment: risks and challenges for commodity market participants

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Biographical note

Jonathan Hill and Ian Jack are members of the Markets Infrastructure Department within our Markets Division. Emmet Doyle is currently on secondment but was also a member of the Markets Infrastructure Department at the time of writing. Jonathan and Ian are Chair and Secretary respectively of FSA's Commodities Group which was formed after the work which led to this paper.

The views expressed in this paper are those of the authors and not necessarily those of the FSA.

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1. Executive summary

After the dot-com bubble burst in 2000, commodities prices and the level of investment in commodities rose significantly. Commodities could provide the yield investors were looking for but, more important, investors began taking greater advantage of the negative price correlation to bonds and equities to diversify their portfolios.

While the FSA monitors the commodity markets through a combination of exchange and firm supervision, commodities have historically been a small and specialised market predominantly used by producers and consumers to hedge their price risk.

As the markets have grown, new investors have been attracted to commodities, with increased interest from pension funds, high net worth individuals and even some retail investors. Most commentators expect investment from pension funds to continue growing and most of that money to flow into index funds. Unlike previous cyclical bouts of investment we expect much of this money to stay.

As a result, a wealth of new products has been developed both on and off exchange to meet investors' needs. These range from new futures contracts in coal and ethanol to exchange traded funds and similar products which may make it easier for retail investors to gain exposure.

We have identified a number of challenges and risks arising from the changes in the market. For exchanges the increase in volumes primarily brings systems and controls challenges – that is, can their trading platforms and monitoring capabilities cope with the huge increase in trading? It is vital that systems are designed and thoroughly tested to ensure they remain robust.

For firms there are several challenges. Recruiting and retaining staff with the appropriate level of expertise and experience is a challenge for all. As more firms have entered the market or expanded their operations the limited pool of experienced staff in the market has become stretched. Firms themselves acknowledge the problem and it is imperative that they manage this risk. Staffing issues apply equally to commodities exchanges which must ensure compliance functions are adequately resourced.

Secondly, firms are facing increased volatility in some markets which raises the cost of trading and the risk of financial failure. It is essential that firms have appropriate and robust risk management systems and procedures in place. This includes thorough testing and modelling for algorithmic trading systems.

Thirdly, in some cases firms are investing in commodities through the acquisition of physical assets such as power stations. This significantly alters their portfolio of risk. Again, risk management systems must be appropriate and senior management must fully appreciate the risks they are assuming.

A further issue affecting firms and exchanges arises from the increasing number of users not previously participating in commodities markets. Aggressive and high-volume trading and ever more ambitious investment funds pose fresh challenges for more traditional users of the markets and for the infrastructure providers who must now operate in a significantly changed environment.

Given the growth of investment and the range of new participants we will be increasing our monitoring of commodities markets. While these markets are no more susceptible to improper practices than any other, firms should ensure they have adequate controls in place.

Consumers risk being exposed to unsuitable investments that they do not fully understand. A growing number of products allow retail exposure to commodities, while indirect exposure through pension funds is also increasing.

Challenges also exist for the FSA. As of the 1 November 2007 the Markets in Financial Instruments Directive (MiFID) introduces for the first time an EU legislative regime for certain firms who trade and deal in commodity derivative instruments. Important aspects of that regime are the subject of a review by the European Commission, due to be completed in late 2008. While MiFID and review of this regime are not the focus of this paper, it is important to bear in mind how they may affect the future of commodity derivatives markets.

In conclusion, there has been a significant expansion in commodities investment in recent years, bringing with it a range of new participants. These developments raise various risks and challenges for those involved. It is essential that all parties fully appreciate and address these risks.

2. Introduction

Two of the FSA's statutory regulatory objectives are to maintain confidence in the financial system and to secure the appropriate degree of protection for consumers. Against these objectives commodities have traditionally been a specialised market, dominated by professional participants, so they have received less regulatory attention than the larger and more high-profile equity and bond markets. However, a significant bull run has been underway in commodities in recent years. Bull markets are nothing new but this time the number of participants and the amount of assets invested has grown significantly. Many are investing in commodities for the first time.

What risks and challenges arise from these recent developments in commodities markets?

To answer this we spoke to several exchanges, hedge funds, pension funds and other firms active in the market. We identified the most recent developments in the market and saw how developing markets are changing the way firms conduct business (and vice versa). There are some areas of uncertainty between commentators, especially when attempting to determine the exact amount invested in commodities so our research is bound by these constraints. Where these uncertainties exist we have set out the range of estimates we were given.

It is vital that firms, individuals and the FSA understand the full range of risks facing them. The purpose of this paper is to illustrate the changing nature of investors, the expanding range of products and to estimate the current level of investment in commodities markets. Most important, we identify and investigate issues facing the market and highlight potential risks and challenges.

Section 3 of this paper describes the FSA's current approach to regulating the commodities markets themselves and the firms that participate in these markets. Section 4 provides some background to commodities and what has made them an attractive investment. Sections 5-7 present our findings on the changing nature of commodities markets, specifically how and why commodity investment is growing and the new products available to investors. We discuss the types of investor and the methods by which they gain exposure to commodities. In Section 8 we highlight the challenges and risks we perceive in the market in light of our findings.

3. Commodities market regulation

The FSA does not have dedicated rules for commodities and commodity derivatives markets. Rather, its regulation of commodities markets is derived from several different regimes and its overall approach combines these. We list and comment on the different regimes in the following paragraphs.

Recognised bodies

Our most direct interface with the commodities markets is through regulation of Recognised Bodies (RBs) under FSMA. These are the exchanges and clearing houses (Recognised Investment Exchanges (RIEs) and Recognised Clearing Houses (RCHs) respectively). The three main UK-based exchanges that offer commodity derivatives markets are ICE Futures, London Metal Exchange and LIFFE. All of these exchanges are RIEs and they all clear through the London Clearing House, which is an RCH.

FSMA prohibits any person from carrying on a regulated activity in the UK unless they are either authorised or exempt.¹ Regulated activities are defined in FSMA and secondary legislation (the Financial Services and Markets Act 2000 (Regulated Activities) Order 2001 (SI 2001/544) (the RAO)).²

Recognised Bodies (RBs) are exempt from the requirement to seek authorisation provided they remain within the boundary of their exemption.³ In summary, the RIE exemption covers the regulated activities that form part of the exchange's business as an investment exchange or provider of clearing services.⁴ The RCH exemption covers the regulated activities that form part of the clearing services run by the clearing house.⁵ To qualify as an RB, exchanges and clearing houses must satisfy the relevant provisions of the Recognition Requirements set out in Statutory Instrument 2001 No. 995.⁶ FSA Guidance on the Recognition Requirements is set out in the FSA's REC Sourcebook⁷, as are FSA notification rules.

1 S.19 FSMA

2 S22 and Schedule 2 of FSAM and the RAO

3 S.285(2) & (3) FSMA

4 S.285(2) FSMA

5 S.285(3) FSMA

6 The Financial Services and Markets Act 2000 (Recognition Requirements for Investment Exchange and Clearing House) Regulations 2001

7 <http://fsahandbook.info/FSA/html/handbook/REC>

RIEs have a continuing obligation to satisfy the Recognition Requirements. These include requirements relating to the fair and orderly running of their markets, and the quality of those markets; the setting and enforcement of market rules; access to the market; complaints handling; and disciplinary action. See Chapter 2 of REC for full details.

The combined effect of the requirements and their exemption from the full regulatory regime is that RIEs are considered front-line regulators of their own markets. The FSA's relationship with the RIEs is more collaborative and principles-based than with the rest of the regulated community, largely working together to ensure the RIEs continue to satisfy the Recognition Requirements while upholding the FSA's statutory objectives.

Similarly, the RCHs that provide post-trade clearing and settlement services are also subject to the Recognition Requirements and relevant provisions in REC.

The FSA also supervises several overseas exchanges offering commodity derivative contracts as Recognised Overseas Investment Exchanges (ROIEs). The FSA has to be satisfied that investors are afforded protection equivalent to that which they would be afforded if the body concerned were required to comply with the recognition requirements. Once recognised, the regime is notification based with the FSA relying on ongoing regulation by the ROIE's home state regulator. The FSA would, however, be able to withdraw ROIE status if the ROIE failed to offer equivalent ongoing investor protection, for example if the ROIE's markets were disorderly. There is an analogous regime for Recognised Overseas Clearing Houses.

Under the umbrella of exchange regulation, the FSA's risk-based approach has enabled it to apply different levels of regulatory touch to the various recognised bodies, according to the level of risk it judges each exchange to pose to its statutory objectives. Commodity derivative markets have generally been considered lower risk than equity markets, because of the knowledge base of traditional users, and the FSA has regulated these markets accordingly. We discuss at length in this paper how the commodities side is gaining different users and how this could potentially cause the FSA to reconsider their approach.

Firm supervision

This risk-based approach has also led to the development of various bespoke arrangements for the supervision of firms active in commodity markets; particularly

energy and oil market participants. These arrangements are in effect concessions to the full firm supervision regime and focus on the prudential treatment of firms. The FSA's conduct of business requirements still apply, although not for business conducted with market counterparties, which covers a significant proportion of total regulated activity in the commodities markets.

Participants in the commodity markets which do not qualify as Oil Market Participants (OMPs) or Energy Market Participants (EMPs) (see definitions below) are regulated in a similar way to other investment firms. For those engaged in other Investment Services Directive (ISD) activities or business, for capital requirement purposes the applicable regime is as set out in the new BIPRU Sourcebook. For commodity derivative firms that are outside ISD scope but within the FSA's regulatory perimeter, for capital requirement purposes they continue to be subject to the regime contained in IPRU (INV) Chapter 3; though see below for the impact of impending regulatory changes.

A Chapter 3 firm's financial resources requirement (FRR) is the sum of its base requirement, total liquidity adjustment, charged assets, contingent liabilities, deficiencies in subsidiaries, total Position Risk Requirement (PRR) and total Counterparty Risk Requirement (CRR).

For firms such as these, the FSA adopts the same approach to regulation as for other firms: making an assessment of impact to decide whether they should be 'relationship managed' or more reactively supervised from the FSA's firm contact centre. Relationship managed firms are subject to regular risk assessments using the FSA's risk assessment framework, ARROW.

Alternatively, a firm may be regarded as an EMP, which is defined as a firm:

- (a) whose permission:
 - (i) includes a requirement that the firm must not carry on any designated investment business other than energy market activity;
 - (ii) does not include a requirement that it comply with IPRU (INV) 5 (investment management firms) or 13 (personal investment firms); and
- (b) which is not an authorised professional firm, bank, building society, credit union, friendly society, Investment Company with Variable Capital (ICVC), insurer, ISD investment firm, media firm, oil market participant, service company, insurance intermediary, mortgage administrator, mortgage lender,

incoming EEA firm (without a top-up permission), or incoming Treaty firm (without a top-up permission).

Energy market activity is defined as:

- (a) any regulated activity in relation to an energy investment or to energy which:
 - (i) is the executing of own account transactions on any recognised investment exchange or designated investment exchange; or
 - (ii) if it is not the executing of transactions on such exchanges, is performed in connection with or for persons who are not private customers;
- (b) establishing, operating or winding up a collective investment scheme which is an energy collective investment scheme in which private customers do not participate.

Financial reporting rules apply to all EMPs and, to date, only one has met the so-called 'main business test' for a waiver. Most EMPs have been authorised as broad scope firms but only act as arrangers; such firms provide the same financial reports as other arranger firms. EMPs must meet Capital Requirements and most have minimised their commitments through being set up as arranger companies for other group companies that hold the trading positions and significant fixed assets.

Although applications have been made, only one EMP has been granted a waiver to the capital requirements. The EMPs capital concession was introduced to encourage authorisation for energy firms with significant asset bases (such as power generators) to the market; these firms might otherwise be penalised by high liquidity charges on these assets.

An OMP is a firm:

- (a) whose permission:
 - (i) includes a requirement that the firm must not carry on any designated investment business other than oil market activity ; and
 - (ii) does not include a requirement that it comply with IPRU (INV) 5 (investment management firms) or 13 (personal investment firms); and

10 Annex 3 contains an extended version of these descriptive statistics covering the additional periods in our new sample.

- (b) which is not an authorised professional firm, bank, building society, credit union, friendly society, ICVC, insurer, ISD investment firm, media firm, service company, insurance intermediary, mortgage administrator, mortgage intermediary, mortgage lender, incoming EEA firm (without a top-up permission), or incoming Treaty firm (without a top-up permission).

Oil market activity is defined as:

- (a) any regulated activity in relation to an oil investment or to oil which:
 - (i) is the executing of own account transactions on any recognised investment exchange or designated investment exchange; or
 - (ii) if it is not the executing of transactions on such exchanges, is performed in connection with or for persons who are not individuals; and
- (b) establishing, operating or winding up a collective investment scheme which is an oil collective investment scheme in which individuals do not participate.

OMP's are only required to submit close links and controllers reports and are exempt from other regulatory capital requirements apart from FSA's Principle 4 (to maintain adequate financial resources), which is interpreted as meeting liabilities as they fall due. An OMP would only be required to meet the financial resources requirement if as a member of a recognised investment exchange it could, under exchange rules, trade with other exchange members.

Alternative Trading Systems

Non-RIE entities providing trading systems are generally referred to as Alternative Trading Systems (ATs), which are in essence investment firms with permissions to arrange multilateral deals in investments. Although resembling in some respects exchanges, they have opted for authorisation rather than exempt status and so are subject to the provisions of the FSA Handbook relevant to authorised persons with such permissions. In addition, as of April 2004, ATs are also subject to additional 'AT Standards'.⁸

8 <http://fsahandbook.info/FSA/html/handbook/MAR/5>

Code of Market Conduct

The FSA published its Code of Market Conduct (the Code) in 2001. The Code provides guidance for what is and what is not market abuse and accordingly what types of behaviour might lead to application of one of the penalties provided for in FSMA Part 8. Among the seven offences provided for in FSMA, no specific offences apply to commodities markets, although some of the safe harbours in the Code are commodity market specific. The potential penalties include censures and unlimited fines.

Apart from supervising many of the firms which are active in over-the-counter (OTC) commodity markets (see above), the FSA's only authority over those markets is through the operation of the Code. The guidance in the Code applies only to qualifying investments admitted to trading on a prescribed market, which include all the UK exchanges. However, if abusive behaviour in OTC markets affects an exchange market, then the FSA may be able to enforce the relevant provisions of FSMA against the parties to the OTC trading.

The Code was updated for the UK's implementation of the Market Abuse Directive in July 2005.

Looking forward: European directives

The implementation of the Markets in Financial Instruments Directive (MiFID) and of the re-cast Capital Adequacy Directive (CAD) (re-cast by the Capital Requirements Directive (CRD)) will affect the recognised bodies and firm supervision regime. Accordingly, the implementation of these directives will significantly affect how the FSA regulates commodity markets.

It is not the purpose of this paper to set out the detailed proposed changes resulting from the implementation of these directives. However, there will be significant changes to the Conduct of Business rules (COBs) and systems and controls requirements applying to firms caught by MiFID. The FSA is also considering how to appropriately continue to regulate firms which fall outside the scope of these directives but which remain within the boundary of the FSA's existing regulatory perimeter.

MiFID and the CRD require the European Commission to report in 2008 to the European Parliament and Council on a range of issues associated with commodity and other non-financial derivatives business. The Commission must answer two main questions:

- Which relevant firms, activities and instruments should be covered by the scope of EU financial markets regulation in these areas?
- Does current EU financial markets regulation need to be adapted to take into account the specificities of the commodities and commodity derivatives markets?

The Commission has published a Call for Evidence regarding that review and has invited comment by 30 April 2007.⁹

One change arising out of MiFID which will affect firms and exchanges alike is the introduction of 'passporting' rights for firms for commodity derivatives business within the scope of the Directive. This will enable firms and exchanges to offer their services across the EU without the need for additional authorisation from any regulator other than the one in their home state. This sudden overnight broadening of the markets automatically available to firms and exchanges will challenge their systems and controls as well as the way the home state regulators supervise them.

Maintaining market knowledge

Supplementing the formal methods of supervision is a rolling programme of informal visits to market participants. Members of the FSA's Markets Infrastructure Department regularly visit firms to keep informed of developments in the market. These visits are different in nature to the supervisory visits firms receive and are a vital means of gathering information and opinion on various issues. We did much of the research for this paper through this network of contacts and, as ever, we are grateful to all those that helped.

Having set out the way in which we currently regulate the markets we go back to the original question we posed: what risks and challenges arise from these recent developments in commodities markets? The rest of this paper presents the findings of our research into the changing nature of commodities markets and answers this question.

⁹ http://ec.europa.eu/internal_market/securities/docs/isd/call_for_evidence_on_commodities_en.pdf

4. Background

Commodity markets are certainly not a modern phenomenon. In this section we look at the development of the market from the late 1990s dot-com era to the present period of record highs and increasing activity, and indicate the attractions for investors.

4.1 History

Commodities influence a significant portion of the world economy, and can be viewed as the largest 'non-financial' market in the world. In recent history, there have been significant bull markets in commodities every 20-30 years. These tend to be caused by supply/demand imbalances, and lead to recurring periods of rising and falling prices. Before the current commodity boom, natural resources had been in a bear market for about 25 years (sugar peaked in 1973, gold in 1979, oil in 1981 etc.).

The last commodities boom was partly triggered by geopolitical and economic events (such as the 1973 oil crisis) and was maintained by strong speculative and trend following investment. With every boom comes bust, and declining markets attract little investment to increase production capacity.

Towards the end of this commodity bear market was the dot-com boom. During this time, global markets saw massive allocations of funds into high-tech companies. Commodity prices at this time were approaching all time lows; 1998 saw an oil price as low as \$10bbl, and mining companies were struggling to survive with copper prices at about \$2,000 per tonne. Under challenge, commodity production infrastructure struggled to cope.

When prices are low producers cannot hedge their future production against current infrastructure expenditure. As commodity prices rise, the viability of increasing investment in infrastructure, and therefore production capacity, increases. With oil prices having reached more than \$70bbl in 2007, and currently sitting not much lower at about \$60bbl¹⁰, it is more viable to invest in new exploration or refineries. Several base metals have reached all-time highs in the past 12 months making it worth investing in mines and smelters. Before certain price thresholds are met it is not realistic to invest in this type of infrastructure.

10 2 January 2007

After the dot-com bubble burst in 2000 investors suffered poor returns from both equity and bond markets. These, with fears that inflation was set to rise, gave investors cause to look elsewhere, and commodities markets saw a fresh influx of funds. In part investors were searching for yield, in part they were seeking an inflation hedge, but mainly they were looking to diversify equity- and bond-heavy portfolios.

Previous underinvestment in infrastructure and strong demand fundamentals, primarily from China and India, resulted in a supply deficit. Importantly the short-term supply of commodities is generally inelastic. Without the necessary capital, producers are unable to build production infrastructure. Even once these projects become viable they need time before they result in increased production. As initial commodity investment increased, prices crept upwards, attracting momentum and trend following investors, thus increasing demand further.

Figure 1: NASDAQ vs. copper vs. Brent crude

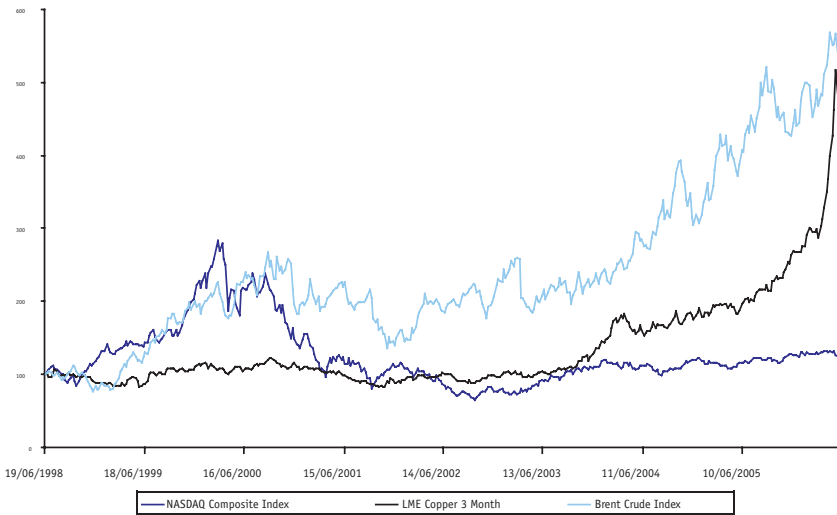
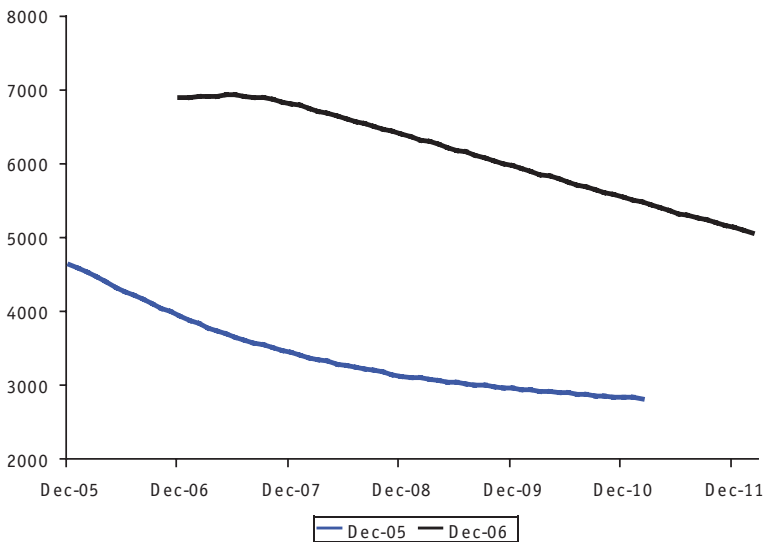


Figure 1 shows the price of Brent crude and copper rising following the rapid decline in the NASDAQ composite. Increased commodity prices have several effects. End consumers are adversely affected as rising costs are passed down the supply chain (recent home gas bills will attest to this). However increased prices raise the forward curve to a level where it becomes viable to hedge future production against current

infrastructure projects. Current prices are running at multiples of base costs to suppliers: it costs roughly the same amount to physically extract a tonne of copper now as it did two years ago, but current prices mean the producer can sell the metal for about \$7,000/t now¹¹ as opposed to about \$3,000/t two years ago. Figure 2 shows the forward curve available to those wishing to sell copper production into the future in December 2005 compared with that in December 2006.

Figure 2: LME copper forward price curve¹²



From Figure 2 we can see that in December 2006 a producer could sell September 2008 copper for \$6,500/t, whereas just 12 months previously this forward hedge would have yielded only \$3,200/t.¹³

11 7 December 2006

12 Bloomberg – 8 December 2006

13 Bloomberg – 8 December 2006

As a result producers are now financially strong enough to invest further in infrastructure, and in the same way that the bull run began with a supply deficit, future production should bring it to an end with a rebalancing of supply and demand. However, it is important to note that of late, and particularly in the oil industry, firms have tended to invest through buying assets of other firms, so they are not investing to increase overall global supply.

4.2 Why invest in commodities?

Studies have shown that commodity price movements have traditionally been negatively correlated to price movements of other financial instruments (such as equities or bonds), so a natural resource investment can provide important portfolio diversification. Equities, bonds and other financial instruments have shown that they tend to follow the same trend in times of economic crisis. In addition, equities are also bound by country-specific economic pressures. In contrast, commodities such as zinc and wheat or orange juice will rarely rise and fall in parallel, regardless of economic fundamentals, and they reflect the global economy.

Figure 3 shows the negative correlation between commodities and bonds and equities over time. By being able to efficiently diversify a portfolio, a fund manager reduces the risk that the total value of their fund will decline given particular economic fundamentals. Figure 3 also shows the positive correlation between inflation and commodities.

Even so, investors should be cautious. Recent price drops have led to media comment quoting commodities professionals who say that the bull run may be over and that it would be a bad time for investors to enter this asset class. They say that with some markets now in contango (i.e. the spot price is lower than the forward price) in the nearby, the roll on indices has become a negative yield. Further, and as we cite above, some commentators point to the number of leading equity indices made up by companies whose share prices are positively correlated with commodity prices, e.g. BP and oil prices, Rio Tinto and the price of copper. This means an investment manager must be very careful when seeking to have a truly diversified portfolio.

Figure 3: Correlation between commodities and a) equities b) bonds c) inflation

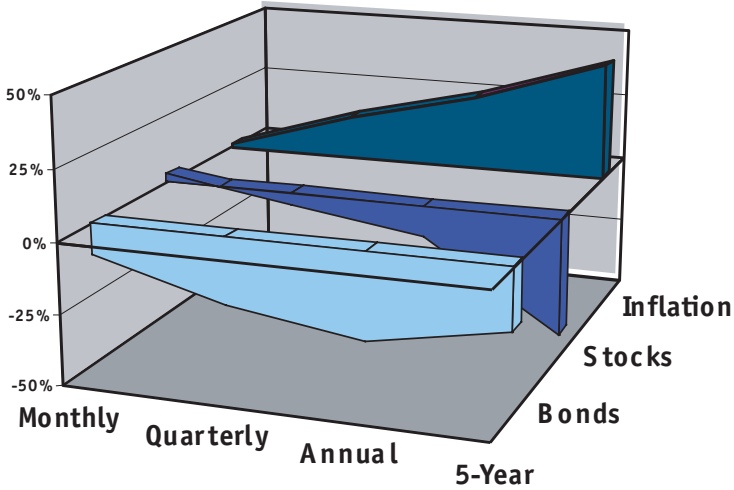


Figure 4: Correlation: Brent crude vs. BP vs. FTSE 100 vs. Shell

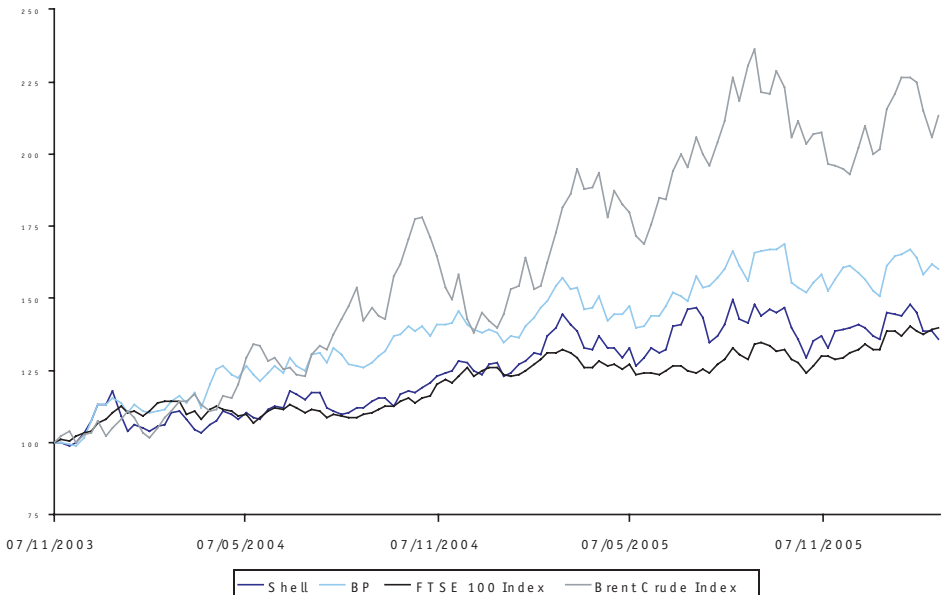
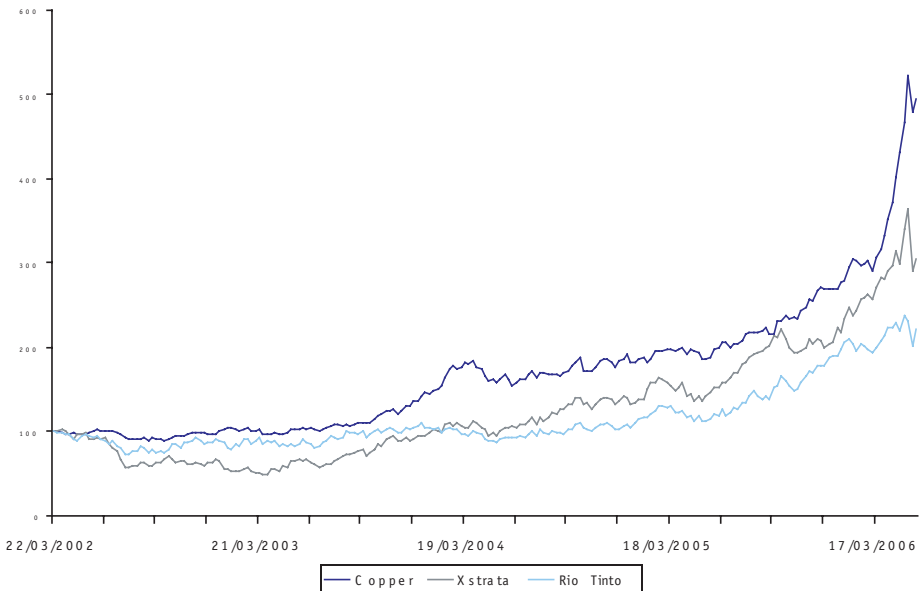


Figure 4 shows that there is a reasonably close correlation of the share prices of Shell and BP to both the FTSE100 and the price of Brent crude.

Similarly Figure 5 shows the correlation between copper prices and the share prices of Xstrata and Rio Tinto (FTSE 100 mining companies).

Figure 5: Correlation: LME copper vs. Xstrata vs. Rio Tinto



4.3 The modernisation of commodity futures markets

For the reasons described, commodities are now seen as an essential part of an investment portfolio. Industry contacts that we spoke to were confident that funds flowing into the sector are here to stay for the longer term. Even if prices ‘correct,’ an exodus is not expected, since the institutional and pension funds are just beginning to invest, and typically do so on a long-term basis for 30+ years.

While market fundamentals have made investments in commodities more attractive, the evolution of the futures markets has made access easier for investors. Over the past few years, one of the biggest facilitators of increased trading has been the

proliferation of electronic trading platforms. These systems have been welcomed equally by both the larger investment firms and the smaller hedge funds (in terms of head count), for whom hiring a team of traders to work on a trading floor would have been prohibitively expensive. Open outcry markets tend to be difficult to follow for those not directly involved with the floor trading, and participants in these markets who are outside of the exchange floor tend to feel disadvantaged. Electronic trading platforms allow all market participants the same access to trading data.

ICE Futures closed its open-outcry trading floor in 2005 to move to a fully electronic exchange and has since seen a great increase in the number of members at the exchange. Undoubtedly the commodity bull run has provided some of this gain, but much of ICE's success is due to the more participants getting real-time access to trading information, full capabilities to trade, and therefore greater confidence in the market. New participants range from individuals using screens in arcades and at home, to larger proprietary trading houses and hedge funds.

The London Metal Exchange and LIFFE have also seen massive increases in electronic trading – LIFFE after becoming a fully electronic exchange, and LME after launching the 'LME Select' trading system alongside floor and telephone trading. Volumes on LME Select have risen from 35,000lots/month in Mar 2002 to 715,000lots/month in March 2006. Anecdotally LME has said that about 80% of outright business is now conducted on Select whereas the electronic platform has only attracted some 20% of the spreads and fills business. Nonetheless, this is seen as a considerable success.

5. Growth in commodity markets

Investment in commodity markets has undoubtedly grown, but commentators found it difficult to quantify. Even the larger market participants that we spoke to were unable to accurately gauge the total size of the market, and estimates varied widely. There was a similarly wide range of estimates regarding the breakdown of investment by market sector.

On-exchange volumes have certainly increased greatly in the past five to ten years. There has been rapid growth in the number of contracts traded on both LIFFE (soft commodities) and ICE Futures (energy). ICE Futures has seen volumes almost double in the last year alone and volumes on LME have increased tenfold since 1990.¹⁴ However in some markets OTC business is equal to several multiples of these volumes.

The December 2006 Bank for International Settlements (BIS) Quarterly Review includes data on the amount of outstanding OTC commodity derivatives contracts among those who report. Figure 6 shows that this market too has increased greatly in recent years.

Figure 6: Notional amounts outstanding of commodity derivatives contracts

Date	June 2004	December 2004	June 2005	December 2005	June 2006
Amount (US\$ billions)	1,270	1,443	2,940	5,434	6,394

SOURCE: BIS Quarterly Review, December 2006

5.1 How will commodity investment grow in the future?

All market participants we spoke to expected investment growth to continue and there are strong arguments to support their case. The last commodity boom was caused by supply restrictions whereas this boom has mainly been caused by dramatic growth in demand (particularly from the rapidly developing economies of

14 www.lme.com – 18 December 2006

China and India); i.e. it is underpinned by what seem to be long-lasting fundamentals. It is widely stated that institutional investors will stay for the long term. Private investors will continue to invest where they gain the benefits from portfolio diversification, whereas the hedge funds are likely to trade the short side as well as the long and will happily benefit from either.

In addition we have already talked of the impact of electronic trading. In many cases remote traders are indifferent to the nature of the instrument they are trading and simply seek a contract with a degree of volatility that they can easily trade in and out of.

Studies indicating that commodities are an effective portfolio diversifier have been around for some time but perhaps it has taken the recent economic climate (dot-com bubble, low equity and bond returns, commodity bull run) for commodities to become regarded as a genuine asset class. Many investors now undoubtedly regard it as such. We think therefore it is a reasonable conclusion that investment in commodities markets will continue to grow, and is moving away from a cyclical opportunistic market to a genuine asset class.

Currently, global pension funds stand at \$18.6 trillion Assets Under Management (AUM)¹⁵ of which estimates suggest about \$80 billion estimated to be invested in commodities. As many now regard commodities as an asset class, most of our correspondents think all institutional investors should build an exposure of at least 5% (equivalent to \$930 billion). So what is preventing institutional investors reaching this level? Only a handful of large UK pension funds invest in commodities and usually at around 3% of AUM. Pension funds are traditionally cautious in adopting new investment strategies which is likely to explain this anomaly. We look more closely at pension funds in Section 6.

It seems from our research that rather than ask how much investment there will be, we should perhaps consider how long it will take to grow. The limiting factors seem to be the time required to educate new investors and the availability of suitably experienced staff. We should also ask ourselves what effect the increasing allocation of pension fund assets may have on the commodity markets. Should the trend continue of investing mainly in passive indices – where the index rolling periods already have a noticeable effect – will the markets be able to sustain these massive influxes?

15 www.ifsl.org.uk – end 2005

6. Who is investing?

Investment in commodities has grown substantially over the past few years, a trend that is expected to continue. In this section we investigate the changing nature of this investment and describe where we see potential for future growth. Throughout our research participants consistently referred to three types of investor:

- institutional investors;
- private investors;
- retail investors.

We consider each of these groups below:

6.1 Institutional investors

In describing institutional investment in commodities, participants talked almost exclusively about pension funds investing through commodity indices. However, the number of large UK pension funds currently pursuing a significant commodities investment strategy is limited. Of those that have publicly disclosed an investment in commodities, two of the most significant are BT (Hermes) and Sainsbury's, although others are maintaining a watchful eye with a view to future investment.

Despite much mention of pension funds entering commodities markets the trend is probably only in its infancy, particularly in the UK. Pension funds in other countries (in particular Holland and Germany) are keener to invest in commodities. The Dutch have led the way, owing to both a flexible regulatory environment and a willingness to build in-house commodity expertise (as opposed to relying upon outside consultants, as is the norm in the UK). ABP (Dutch civil service) has \$226 billion AUM and 2.7% currently invested commodities.¹⁶ The Dutch government gave ABP the freedom to look after its own investments over a decade ago and the pension scheme is consistently seen as being at the cutting edge of pension fund innovation. Most recently it was awarded the 'European Private Equity Firm of the Decade' from Financial News. Similarly the Dutch healthcare pension fund PGGM has \$89 billion AUM and 5% of this is invested in commodities.¹⁷

16 www.abp.nl – as at 31 December 2005 (\$/ 1.1820)

17 www.pggm.nl – as at 31 December 2005 (\$/ 1.1820)

Among the British, Hermes appears to be the leader with \$129 billion AUM and 3% currently in commodities. Hermes is owned by the BT Pension Scheme (BTPS), which has \$67 billion AUM. In 2006 Hermes announced a £1 billion investment into commodities on behalf of BTPS by way of an open-ended listed fund, which will track the Goldman Sachs Commodity Index (GSCI) Light Index.¹⁸

Besides the British and the Dutch, several US pension funds have significant investments, such as CALPERS (The California Public Employees' Retirement System), which has \$207bn AUM and reportedly around 3% of this currently invested in commodities. One commentator suggested that changes in the regulatory regimes of France and Denmark may see pension funds in these jurisdictions follow the Dutch example.

Many pension funds clearly still do not invest in commodities at all or only regard commodities as a peripheral diversifying investment to their portfolio. All the commentators we spoke to identified pension funds as the main source of future inflow into commodities but were no more specific than this.

Pension funds have a long investment horizon and often take time to decide on a particular investment strategy. This may be particularly true of commodities markets that are generally less well understood than the bond and equity markets. One participant talked of spending up to 18 months educating clients before they invested. However, once they choose to invest they typically stay for the long term. Most respondents said the majority of this money will be invested in indexed products. In the next section we look at the relative merits of investing in long-only index products.

Finally, what of other institutional investors? Our dialogues with participants indicated that 75-80% of the funds invested in the GSCI are from pension funds. The rest is from corporations investing their reserves. Insurance companies are not at all heavily invested in commodities, although some commodities may appear to be natural hedges against catastrophes. This was put down to the restrictive regulatory requirements on what they may or may not invest in and the range of alternative ways to spread their risk.

18 www.hermes.co.uk – as at 31 December 2006 (\$/£ 1.9593)

6.2 Private (intermediate) investment

By 'private' we are referring only to high net worth individuals, sophisticated investors or family offices, i.e. not retail. With reports appearing in the mainstream press about the commodities boom, it was almost inevitable that private investment in commodities would grow, and so it has. However (and in common with hedge funds) it is difficult to quantify. One market participant said it is a bad time for private investors to be coming into the markets with prices so high. Others believe that prices are below historic 'real value' highs, and the fact remains that as an addition to a portfolio of other financial instruments, commodity investment still provides good diversification.

Private investors will enter the market through an intermediary. Two such intermediaries told us that products available to private clients are currently very limited, and private customers rarely take on exchange positions. Trading on exchange is beyond the reach of the average customer; for example the smallest tradable contract size of copper was until recently worth about \$170,000 whilst for Brent crude it reached about \$70,000 at the height of 2006's price increases (1 lot = 1000 barrels). On 4 December LME introduced 'mini' contracts in copper, zinc and aluminium, for which one lot of copper is worth about \$35,000.¹⁹

However, a few index funds available to US retail investors may also appeal to private/intermediate investors. But even buying into an index is very expensive –we have seen offerings with a minimum investment of \$70-80,000 over a minimum investment term of three to five years. It is important to note that these types of products (and many others offered to private investors) are offered in the form of structured notes. By their nature, structured notes tend to be tailored to the individual's requirements and typically offer substantial (90-95%) capital protection with the opportunity to benefit on the upside. In this sense, they are not as risky as investing directly into the futures markets, or directly into an index fund. This has to be balanced with the credit risk the investor takes on.

One private wealth manager told us that their clients are increasing their interest in commodities, and typically will have 3-7% invested in the sector. Private wealth managers are generally more interested in capital preservation over risk-based returns, and therefore take a more conservative investment approach, emphasising the use of commodities as a diversification tool, and as a hedge against rising inflation. The typical route to market for this wealth manager's clients is to buy structured notes linked to index funds.

19 6 December 2006 Official Settlement Price \$6,994/t Mar 07

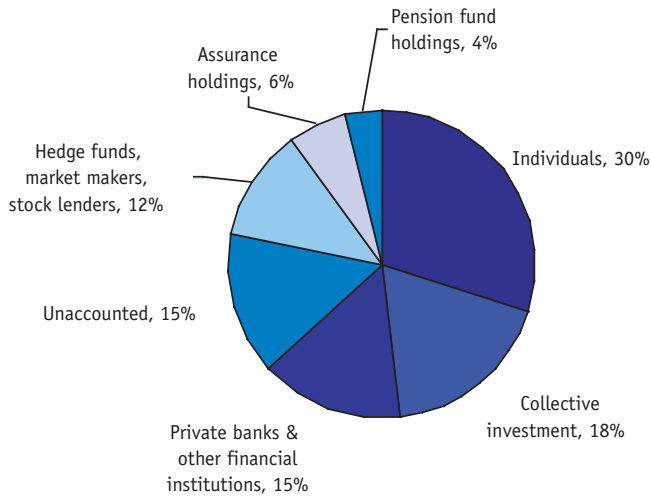
6.3 Retail investment

The unanimous view is that there is hardly any retail investment in commodities markets, especially in the UK. Some told us that there was more interest on the continent, particularly in Germany, and also in Asia. There is doubtless considerable pent-up demand amongst institutions to market commodity-based investment products to retail investors, but regulations and routes to market have so far prevented it. Unlike investing in blue-chip equities, which would be generally expected to increase in value over time, commodities markets are viewed by many as too volatile for retail investment. However many respondents felt that institutions must be looking hard for ways to offer retail customers exposure to commodities markets and that, with time, suitable products would be developed.

Exchange Traded Funds (ETFs) are one candidate to fill the retail gap. In a recent survey by Edhec Business School, 55% of respondents expected increased use of ETFs and 36% expected commodities to be the one of the biggest growth areas. Of the 122 institutional investors and asset managers surveyed 15% currently trade ETFs and a further 20% expressed interest in doing so soon. At present investment in ETFs is relatively limited and retail and intermediate customers make up only 30% of this small amount. However these products are possibly the first with the potential to open commodities to retail investors. Figure 7 shows the breakdown of UK and European ETF investors.

The total size of holdings of gold by ETFs as of 7 July 2006 was 516 tonnes, which was equivalent to \$11.4bn at the then prevailing prices. Assuming individuals are equally well represented in gold ETFs as for ETFs more generally, this would suggest a figure of \$3.4bn retail investment globally (it is estimated that 79% of ETF holdings are US-sourced funds; 17% UK/European- based funds).

Figure 7: Breakdown of UK and European ETF investors



SOURCE: Exchange Traded Funds, July 2006

In addition to the ETFs currently available, a group of products have been released called Exchange Traded Notes (ETNs). ETNs are traded as debt securities that can be bought, sold, and shorted like a stock and can be used to gain exposure to commodities. The first two ETNs track commodity indices (GSCI and Dow Jones/AIG), but further forms of ETNs are likely to be launched tracking other benchmarks. Investors can trade ETNs on the New York Stock Exchange through a broker at market prices that are set throughout the day by supply and demand. They also have an arbitrage mechanism that theoretically should keep market prices close to the intrinsic value of their benchmarks. Essentially, ETNs are a promise to pay back an amount linked to a given benchmark (minus fees) and the buyer takes on the credit risk of the issuer. Observers suggest that ETNs may have different tax implications to ETFs.

A third group of products called Exchange Traded Commodities (ETCs) have recently been launched on the London Stock Exchange, Euronext Amsterdam and Deutsche Borse. They offer the choice of a range of individual commodities and several different index-tracking securities. ETCs are open-ended asset-backed securities and

can be regarded as secured, undated, zero-coupon notes that trade through an open market-maker platform. Time will tell how successful these products are in making inroads into private/intermediate funds.

For the retail investor there are also less direct routes to gain commodity market exposure, such as investment in commodities through the listed securities of commodity companies, e.g. Shell, BP, Rio Tinto etc.

7. How are they investing?

Once an investor has decided to make a commodity investment they face a wide range of options as to how best they should structure their exposure. Previous sections have referred to various products that offer commodity exposure, though these are by no means the only ways of investing. As interest in commodities has risen the range of available products has developed to meet the needs of new and existing investors. In this section we consider some of the latest on-exchange commodity contracts and describe the types of investment vehicles and companies frequently used by investors. We also briefly consider those firms who have invested in commodities through acquiring infrastructure such as power stations.

7.1 Development of on-exchange contracts

Increased investment has resulted in a variety of innovative new futures products such as weather derivatives, emissions contracts, freight contracts, plastics contracts and, soon to be launched steel futures and coal derivatives contracts. At present these products remain a relatively niche market. Below are brief descriptions of some of the newer on-exchange futures contracts.

Plastics: In 2005 the London Metal Exchange launched two plastics contracts, seen by some as a divergence from the norm for a metal-trading exchange (the contracts may have sat more comfortably with an oil-trading exchange as their key ingredients are by-products of the refining process). Volumes in the contracts have been very low. The exchange subsequently increased the shelf-life of the underlying plastics being traded, making it possible to hedge production/consumption out to three years, and have recently announced a change to the date structure and the introduction of regional pricing (both to be launched 25 June 2007) with the intention of stimulating volumes.

Steel: The LME have assigned Platts as a price compiler for a new steel contract on the exchange. The contract is most likely to be cash settled (transportation and storage of steel is not viable due to cost per ton and corrosion). The LME hope the price will be seen as a global benchmark, with other grades of steel being priced at a discount or premium. The steel consumption industries have expressed much interest in the contract, expected to be launched in 2007.

Emissions: Emissions futures were launched on exchange (ICE Futures) in April 2005, and currently trade 1,500-4,000 lots per day. Before this they were traded

exclusively OTC in the UK. With the exception of WTI, this is the most successful contract to be launched on ICE Futures since 1988 (the date of launching Brent crude futures). The contract is based upon the buying and selling of surplus emissions allowances. Allowances are determined by the EU in phases for anybody with a 20 megawatt installation (such as a boiler or generator). The contract is physically delivered in so far as bearer documents for 1,000 tonnes of emissions are exchanged upon expiry.

Coal: Two contracts were launched 17 July 2006 on ICE Futures. Both are cash settled, with one based upon delivery into Rotterdam and the other 'free on board' in South Africa. The contracts have received a mixed reaction from the market in terms of their potential for success, with the majority believing that they will probably not make a big impact for some years. These predictions appear to have been borne out so far by very low volumes and little open interest.

Ethanol: Futures contracts can be traded in Chicago and New York. The market has been growing as ethanol has become the oxygenate additive of choice for the US gasoline industry. Volumes remain relatively low since the blending of ethanol with gasoline must be performed at point of sale, so the production and delivery infrastructure needs investment (which is currently being made). A large market exists in Brazil, where about 25% of fuel is derived from ethanol.

Freight: The bulk of the liquidity in freight contracts is OTC, but they are available on NYMEX through ClearPort (OTC clearing service). There are two variants: 'wet' for transportation of oil and 'dry' for all other products. It is very difficult to set reliable benchmark prices for these contracts as there are so many shipping routes. As a result there are currently no highly liquid futures contracts.

Weather: Weather futures are tradable on Chicago Mercantile Exchange. The contracts allow the user to hedge against weather that could negatively affect their business. They will pay out a given amount on the basis of certain weather conditions being met over a finite time period. For example a ski resort could hedge against the risk that less than two inches of snow will fall in February (so reducing their income). Volumes have been growing in these contracts and there is also an OTC weather derivative contract tradable in the UK through ATS providers such as Spectron.

7.2 Investment vehicles

Commodities are a relatively niche market and many of the investors described in section 6 lack the necessary expertise or desire to take on-exchange positions directly. More commonly investors pay a third party to manage their commodity exposure. There are typically three main vehicles for investors to do this:

- index funds;
- hedge funds;
- commodity trading advisers.

One large multinational bank has estimated that as much as US \$200 billion is invested in commodity markets. They estimated that most of this investment is made via index funds (approximately 40% and growing), hedge funds (about 30%) and commodity trading advisers (about 20%), and each of these sectors is expected to grow in investment size over the coming years. Here we look at the characteristics of each of these methods of investing.

7.2.1 Index funds

One of the easiest ways to add commodities to a portfolio while simultaneously diversifying the risk among these commodities is to buy into a commodity index fund. Commodity index funds enable investors to 'buy the market' in a single investment; those running the funds take on the expense of trading and researching the individual commodities in the index. Buying the market also ensures a balanced and diversified basket of commodities – losses from one sector should be counterbalanced by gains from another.

Index funds are long only, and all their transactions relate to futures – there is no physical ownership of the underlying inventory involved. Index funds buy a forward position, then sell this as it approaches expiry, and use the proceeds from this sale to buy forward by one or two months again (a process known as 'rolling').

Being long only, index funds are susceptible to poor performance in falling or contango markets, or both. One of the main issues surrounding this type of investment is that the large index funds do not sell short (i.e. sell on the anticipation of a falling market and buy back at a cheaper price at a point in the future). As a result they are unable to benefit in the same way as say a hedge fund

might in a falling market. It is also worth noting that they are un-leveraged i.e. fully collateralized with T-bills, leveraging being a technique a hedge fund would typically use to increase yield.

7.2.1.1 Growth of indices

Investment in index funds has grown dramatically in the last five years, and they are the largest market players in terms of AUM. The Goldman Sachs Commodity Index (GSCI) was launched in the 1980s and by the early 1990s had grown to \$1bn AUM. In 2001 its value was in the range of \$4-5 billion, and has grown to \$55-60 billion currently.²⁰

Of all the commodity index funds the GSCI is by far the largest. Other significant funds include the Dow Jones AIG Commodity Index which has an estimated \$10-15bn AUM, the Deutsche Bank Liquid Commodity Index and the Rogers International Commodity Index which have less (c. \$5bn). The number of index funds has been increasing steadily over the past few years. Most of these start with the GSCI weightings, and then go over/under weight in certain areas.

7.2.1.2 Composition of index funds

Index funds are put together as baskets of commodities, and the components will always be highly liquid futures traded on exchange. Different index funds will have different weightings of component investments, and there are significant differences in the number of commodities tracked by each index. For example the Rogers International Commodity Index tracks 35 commodities, and at the other extreme the Deutsche Bank Liquid Commodity Index tracks just six. Figure 8 shows the weightings by component for five of the largest index funds.

20 On 6 February 2007 it was announced that Standard & Poors had acquired the GSCI Commodity Index which will be renamed the S&P GSCI Commodity Index.

Figure 8: Weightings by component of several large index funds

	DBLCI	AIG	GSLE	GSCI	Rogers
Energy complex	55%	33%	36%	69%	44%
Industrial metals	13%	18%	23%	11%	14%
Precious metals	10%	8%	5%	2%	7%
Agriculture	23%	30%	26%	12%	30%
Livestock	NIL	10%	9%	5%	5%

Components	6	19	24	24	35
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Indices are essentially conservative and transparent investment vehicles. In the case of the GSCI, Goldman Sachs publishes the component weightings and performance on its website. These constituents and their weightings vary from time to time according to how much trade there is in each of their respective underlying markets and the value of the underlying commodities. The main GSCI currently contains 24 commodities: six energy products, five industrial metals, eight agricultural products, three livestock products and two precious metals.

As the first index to be successful and because of subsequent take-up, the GSCI is seen as the foremost index in the industry. Indeed many new index products are set up using GSCI weightings as a starting point. Investment in GSCI or one of the numerous competitor products based on it offers the investor a general exposure to commodities markets. It is a simple and essentially low-risk way of diversifying a predominantly equity-based portfolio without the investor having to make investment decisions about individual commodity markets. It is energy heavy, indicating aspirations to provide growth through Beta.

Other major indices in the market behave slightly differently. In contrast to the GSCI, the Dow Jones AIG Commodity Index is designed entirely with diversification in mind. No single commodity can comprise more than 15% or less than 2% of the index, and no one sector can represent more than one third of the total index. Cocoa, for example, was dropped from the index in 2005 because its weighting fell

below the 2% floor (a floor which is based upon a combination of average global production and average trading volume over the most recent five-year period). These rules make the index relatively less volatile; an attractive feature for certain types of institutional investors such as pension funds. The futures components for this index are all traded on the Chicago Board of Trade.

The Deutsche Bank Liquid Commodity Index (DBLCI) was launched in 2003 and consists of just six commodities. The six commodities chosen are amongst the most liquid in their sectors, which importantly enables DBLCI to increase capacity for new investments, and also reduces transaction costs. Other indices tend to have more components, thus apparently creating more diversity, but DBLCI argues that commodities in the same sector will follow the same trends, and so little diversity is actually lost.

Rogers International Commodity Index was launched in 1998 and is by far the widest ranging (in terms of components and international investment) of the six indices. It currently consists of 35 commodities, including some of the less well-known commodities such as lumber, oats, barley, azuki beans, wool, rubber and silk. The selection and weighting of the index is based on consumption and is overseen by Jim Rogers, co-founder of the Quantum Fund with George Soros. The composition and weighting of the index has not changed since its creation in 1998.

7.2.1.3 Index roll period

Passive index funds will normally roll contracts at a time dictated and hard-wired into their investment agreements with customers. Typically this will take place over a five-day period where 20% of contracts are rolled each day. Rolling periods for indices have become predictable to the rest of the market, which means the market can move against them.

The notional amount of commodities underlying the investments of index funds is very large. Taking the GSCI on its current asset allocation, 3.96%²¹ of an estimated \$60bn is invested in copper. At current market prices (about \$7,020/tonne²²) this equates to about 340,000 tonnes, or more than twice the amount of copper currently in LME warehouses.

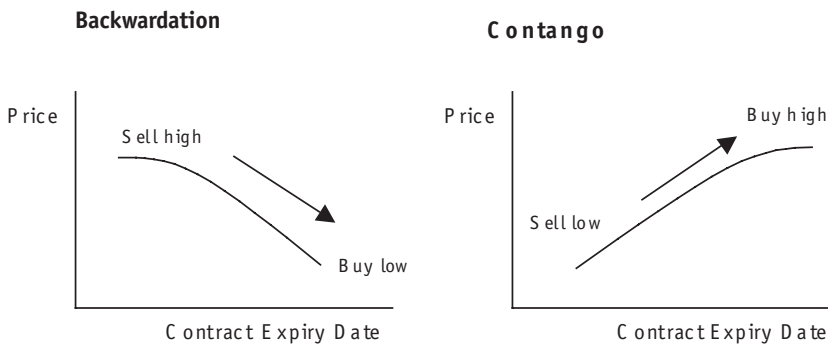
21 www2.goldmansachs.com – 18 December 2006

22 8 December 2006

Such large positions create massive amounts of open interest (i.e. contracts that are 'live' – having not yet come to expiry or closed out), and while the large monthly rolls seen with these indices create large amounts of trading, in real terms some of the participants that we spoke to felt that liquidity in the nearby (i.e. front contract months) has become tighter in some markets. During the roll periods there are many trying to roll around the same months, so they need an equal number of counterparties heading in the opposite direction; as counterparties dry up, future prices will rise, and 'spot' prices will fall. Participants admit that the effect of \$55+ billion of investment cannot be ignored and will have some effect on price. But gauging the extent of this effect is very difficult; such a significant roll of futures contracts will cause a move in the market, but only in the short term – the roll will only affect markets in the week of the roll, and markets tend to correct afterwards. Participants also agreed that price movements are being exaggerated by trend-following fund investment, and that news relating to market fundamentals is affecting the price of certain commodities much more than it would have done before such speculative investment became widespread.

The rolling of futures positions can also result in a profit or loss for these funds depending on the structure of the forward curve at the time. Figure 9 demonstrates how this relationship works. If the market is in backwardation (forward price lower than spot) index funds earn a positive 'roll yield', or 'roll return', if the market is in contango (forward price higher than spot), then they will lose money through a negative roll yield.

Figure 9: Forward curve structure and the effect on roll yield



In times of strong backwardation index funds derive much of their gains from roll yield. As some commodities have shifted into contango investors have begun to question if this is the right time to be entering the commodity markets. Our contacts made different comments on the risks of the roll period. Several of those we spoke to warned that with prices already high, investors investing in indices at this stage of the bull run risk losses. Others pointed to prices of most commodities still not having reached inflation-adjusted historical highs, so they expect further growth.

In any case some investors are now opting to place a portion of their commodity allocation into actively managed funds, which should act as a hedge against negative yield conditions. The rigidity of the index funds contract rolls is seen by some as awkward – an index will know the curve is in contango in the nearby and that they are about to accrue negative yield, but will continue with the contract roll in the knowledge it will be unprofitable.

Those running index funds are aware of investor concern over negative yield rolls, and recently DBLCI changed the way it rolls futures contracts to mitigate the negative effect of contango markets. By becoming more active in the trading of futures during roll periods, DBLCI aims to make negative yield less likely. Other participants mentioned that they were analysing how and when they roll. The consequence of adopting a more active strategy is the additional expense of employing traders and researchers to determine how and when to roll contracts. The expense of using an active strategy was estimated to be four basis points of ultimate yield by one participant. There is however a risk that as index funds increase in number and size some markets will be unable to sustain a passive roll by several funds around similar dates. Whether other passive index funds will use a more active strategy is yet to be seen.

7.2.1.4 The future for index funds

It is felt that institutional investment in commodities is in its infancy, and as investors become more confident in the sector, new funds will continue to flow in. Our contacts believe that as institutional investors become more aware of the sector they will start placing funds with more specialist (i.e. active or non-index) investment managers. Some respondents commented the long-only nature of the GSCI and similar indices. As the vehicle of choice for institutional funds entering the commodities markets, disappointing returns could give a false impression of the potential gains to be made from the markets, potentially dissuading further institutional investment in future. As discussed below, many investors are being more specific in what they require and structured notes based on indices may suit them better.

7.2.2 Hedge funds

Less information is available in the public domain about hedge funds than about the more established institutional investors we have been discussing thus far. Accordingly, our findings here are less extensive than those for other investment vehicles. We should take care in this area since it is very difficult to put hedge funds into a single category. The term 'hedge funds' covers many different types of business, with few similarities between them. Indeed, the only distinguishing factors of a typical hedge fund trading commodities are its ability to sell short (to bet on falls in the market and profit from them), and its legal structure (where the fund is domiciled in an off-shore tax haven, and typically listed in Dublin, with the investment management led by a team in London).

Some hedge funds do openly publish performance and other details, such as the percentage of commodity classes they invest in, on their websites. In fact one of the funds that we spoke to had hired a third party to regularly value the fund, as they felt their current fund administrator was not reporting quickly enough. As with other market players, funds have customers who will demand performance figures. However, the degree to which these figures are released to the wider market varies widely.

Determining the total size of hedge fund investment in the sector is therefore very difficult, partly due to the difficulty in classifying hedge funds and partly due to the more opaque nature of some hedge funds. Market participants that we spoke to (including the large investment banks who act as prime brokers for such funds) could not confidently estimate the size of market participation by hedge funds. Estimates varied widely from \$40 billion to \$100 billion.

Typically, hedge funds are interested in investing in any markets with good liquidity and high volatility. They rarely become members of exchanges, and are willing and able to perform some of the higher-risk trading strategies. Hedge funds buy or sell at any price position along the forward curve based on fundamental views – they can play either longer or shorter term, and will invest anywhere they see value. Hedge fund activity plays a vital role in increasing liquidity throughout the forward curve.

Whilst some of those that we spoke to complained about the opacity of various hedge funds, and that they are subject to a lighter regulatory regime, without doubt their presence has provided valuable, risk-reducing liquidity for the rest of the market. Trading activity (regardless of its source) can bring liquidity where previously it had failed to develop, typically further down the curve and in less liquid contracts. The presence of funds all along the curve has enabled producers

and consumers to hedge production/consumption much further into the future, thus adding security for participants and therefore for the market as a whole. Typically, without liquidity it is difficult to determine whether a fair price is being quoted (if indeed one is quoted at all).

Of the funds in commodities markets, an estimated 80% are looking for higher-than-market-following returns (alpha). Only 20% of hedge fund money is likely to be looking for the market-following returns typically offered by indices (beta). The alpha money is short term and will quickly move into and out of the market. Correspondingly, beta money tends to stay there, in this context typically for one to two years.

The exchanges offered differing views as to the activity of funds on UK Recognised Investment Exchanges (RIEs). It has recently been estimated that 85%+ of activity on the LME is derived from index and hedge funds. On ICE Futures however, the figure is thought to be much lower. It seems likely that the participation from funds in LME contracts is driven by the high volatility those contracts offer. It is also important to note that the LME is (comparatively) a smaller market with historically smaller players in comparison to, for example, ICE Futures, whose membership includes major oil companies.

Hedge funds tend to be more flexible in their investment approach enabling them to quickly change direction. They can be at the cutting edge of investment practice, and can implement some of the more modern trading styles. For example, an increasing amount of fund volume is traded through 'black box' systems; algorithmic models into which data is fed. The models either produce a list of trades which are manually sense-checked, or in some cases, automatically emit trade signals to be processed through a trading platform and traded.

A more recent development into the market is the arrival of specialist commodity hedge funds that are trading in just a single commodity, and in some instances are willing to play the physical underlying market by taking delivery of physical commodities for future resale on exchange/OTC.

It is also worth noting that some 'commodity' hedge funds only take exposure to commodities through securities in commodity companies, i.e. mining, utility companies etc. The risk with these firms is no more than that of other funds which selectively invest through individual equity sectors.

7.2.3 Commodity trading advisers

Commodity trading advisers (CTAs) specialise in technical buying and selling of nearby positions based on short term trends (which can create volatility in short run prices). They are similar to hedge funds in this regard, but tend to concentrate on the nearby, looking for arbitrage opportunities and other short-term potential. CTAs are estimated to have \$40bn under management.

With the massive amounts of trading activity performed by index funds every month, the structure of the forward curve has changed, with some markets moving into contango in the nearby (such as Brent crude and several of the base metals). What is for sure is that the period of making 'easy money' by rolling nearby is over. Both hedge funds and CTAs have been moving away from this front end of the curve, and are concentrating on accumulating positive roll yield in parts of the curve where liquidity is improving, and the curve remains in stronger backwardation.

7.3 Acquisition of physical assets

In some cases firms are investing in the underlying infrastructure. For example, firms will invest in power stations or mines as well as the financial instruments based on power and metals. By doing so, firms are dramatically changing their portfolio of risk. Financial institutions have developed sophisticated risk management systems to deal with the risks of financial instruments and the underlying commodities, investing in infrastructure represents something quite different. So it is vital that firms properly understand the full range of risks and have appropriate risk management processes to deal with them.

8. Challenges and risks

Given the marked change in the landscape of commodities investment, several challenges and risks exist. Here we detail these challenges and the risks we perceive for firms, Recognised Investment Exchanges, and consumers exposed to the commodities markets.

8.1 Firms

8.1.1 Lack of expertise

Many firms told us of the challenge in recruiting enough staff with the appropriate degree of expertise and experience. As firms have expanded their commodities investment activities, or have entered these markets for the first time, they have struggled to recruit staff with the necessary experience. Some firms are transferring staff from the fixed income areas of their business, or staff with experience of derivatives but not specifically commodity derivatives. Firms are training staff in this area but there is inevitably a time lag before these staff gain enough experience. If the sector continues to increase, this will become an even more pressing matter. Stories of qualified commodity derivatives traders receiving substantial recruitment inducements indicate the extent to which demand exceeds supply in the market. Many we spoke to said that while they have the people they need, they doubt others can recruit the necessary commodities specialists. We expect that all firms would consider they have adequate resource, but we heard the same concerns so often that we have to conclude that some firms must be overstretched. The FSA's Financial Risk Outlook 2007 identifies this as a risk and it is something that concerns our firm supervisors. If inexperienced traders don't fully understand the nature of the commodities markets they operate in, this could harm the interests of both individual firm and the markets as a whole.

8.1.2 Ineffective risk management

Several markets have become much more volatile, and many analysts believe that the market is not responding to fundamentals as perhaps it used to. Electronic access has speeded up the markets and algorithmic trading enables the trading of large volumes very quickly. So the daily price range can be much wider than before.

In light of this increased volatility firms' risk management must be effective and their risk modelling appropriate. One of the Ospraie funds (a US-based hedge fund) had to close after incurring substantial losses on short base metals positions. Amaranth Advisors was also forced to close after suffering heavy losses of around \$6billion in a single week from a wrong way bet on natural gas spreads. Many correspondents believe this was an important test of market stability, demonstrating the ability of the markets to spread risk. These examples do however highlight the potential pitfalls that await firms that fail to maintain effective risk management systems and risk models.

To return to the issue of 'black box' trading, it is essential that firms have adequately tested their algorithmic trading systems. Many scenarios must be modelled to ensure automated trading systems behave appropriately in any given set of circumstances. By way of example, overnight trading when volumes are thin can, and has, resulted in unintentional disorderly trading and price spikes in some markets. Exchanges and firms have an obligation to ensure markets remain orderly at all times.

8.1.3 Potential for market abuse

There is no suggestion that these markets are any more susceptible to market abuse than any other, but the FSA will increasingly focus its attention on monitoring them. This reflects the growing size of the markets, though still relatively small, and the increasing range and changing nature of those investing in commodities. It is vital that appropriate measures are in place at firms and exchanges to detect and prevent improper practices, and that the FSA ensures markets remain efficient, orderly and fair.

8.1.4 Acquisition of physical assets

In addition to the changing risks facing firms due to increased volatility some firms have become involved with commodities through the acquisition of physical assets such as power stations. This presents a significantly different element to their portfolio of risk, which is otherwise determined by the management of exposure to financial instruments based on underlying commodities. It is vital that firms have appropriate arrangements in place to manage this very different type of exposure and the resulting range of risks.

8.1.5 Increased cost of trading

In times of sustained volatility the clearing houses increase initial margins. Margin rates on the London Metal Exchange increased by 500% (from \$5,000 to \$25,000/contract) over the space of a few months. Larger firms can afford to buy or sell, but smaller players have had to reduce the number of contracts they hold, which has reduced overall market open interest, and may lead to greater volatility in the market (which in itself may discourage more conservative investors).

8.1.6 Liquidity Issues

Several participants felt that the influx of money into the commodity markets had caused increased tightness in some markets, especially in the front months where index rolling takes place. As is always the case with physically delivered markets a risk may exist that some speculative investors are unable to trade out of certain positions, resulting in the delivery of physical assets on occasions. However, our findings do not suggest this is of particular concern to the market at present.

8.2 Recognised investment exchanges (RIEs)

8.2.1 System capacity

With volumes increasing rapidly over the past five years, UK Recognised Investment Exchanges upon which commodity futures are traded have had to ensure that their systems and controls are sufficiently robust to enable them to monitor their respective markets. Primarily, especially given the shift towards electronic trading, this means that IT systems must be thoroughly tested and robust and able to cope with large volumes.

The first concern may be the trading platform, but exchanges must also consider the requirements for reporting data and ensure the systems in place are sufficient to deal with this side of operations.

8.2.2 Compliance resource

Compliance departments must be appropriately staffed and capable of maintaining standards of monitoring. The challenge of recruiting staff with appropriate expertise and experience is also one that many firms are facing.

8.2.3 New user types

New users often have trading experience but may be less well aware than traditional users of commodity markets behaviours and characteristics. Conversely, they may bring new techniques that the commodity markets are not used to. For example, an automated trading system or inexperienced commodities trader may seek to exit positions triggered by stop-losses at times of low liquidity, or too near to settlement and cause an unusual price spike (which may be less remarkable in equity markets). The challenge for exchanges is to separate inexperienced behaviour from potentially abusive behaviour and then to decide on the most appropriate action, be that education or disciplinary measures.

8.3 Retail consumers

8.3.1 Suitability of investment

We have reported on the eagerness of some market professionals to devise investment products to target retail consumers, and they have begun to do so with varieties of ETFs, ETNs and ETCs. We have reported the scarcity of experienced market professionals who fully understand the subtleties of the commodities markets. Given these two factors there may be a danger that consumers will be at risk of taking up investments without sufficiently understanding the associated risks.

8.3.2 Indirect exposure is growing

Institutional investors have to be authorised to invest in commodities markets (or have a mandate to invest in them in the case of pension funds), yet consumers are already increasingly exposed through the assets institutions hold on their behalf. At present, a pension fund is unlikely to fail through over exposure to commodities where these represent an estimated average 3% of the portfolio. However, if some firms increase their exposure to 20% as has been suggested, the risk of significant losses may increase even if a failure doesn't occur. Significant pension fund losses would create undesirable consumer detriment.

9. Summary of findings

Lower returns from bonds and volatile equity markets have made commodity derivatives more attractive because of their negative correlation to other financial instruments. Limited supply resulting from long-term underinvestment, coupled with burgeoning demand from China in particular, has fuelled a fundamentals-based bull run and added to the appeal of investing in commodities. This spectacular bull run has certainly attracted investors but it is the negative correlation to bonds and equities (and positive correlation with inflation) that will continue to attract investment and ensure existing investment is maintained.

It is widely considered that investment will continue to grow, and an increasing number of fund managers see a 3-7% holding as an effective way to diversify an equity- and bond-heavy portfolio. Pension funds in particular have begun to invest in commodities and this trend is expected to continue. The long-term investment horizon of such institutional investors also indicates a prolonged period of commodity investment.

This recent growth of investment has been characterised by an expanding range of investor participant, one group of which is the pension funds. Commodity markets have traditionally been dominated by commercial entities but there is now significant involvement by hedge funds and pension funds, and increasingly from private individuals.

The majority of inflow has been, and continues to be, into index funds. An index allows effective diversification with one investment, and the range of indices and sub-indices provides a choice of index components. Long-only passive tracking funds have the disadvantage that they accrue losses when the forward curve structure is in contango. Given that this is now the case in several commodities, potential investors may have to consider whether the time is right to enter the market. Several indices have adopted a more active strategy to tackle the issue; however, the negative correlation to equities and bonds remains the primary motivation for investing so for many it is a case of when, not if.

In terms of retail participation, investment is currently very limited. Several large investment houses are starting to sell new products that allow easier, cheaper access to commodities, and so this side of the market is also set to grow. The new products offered have so far tended to be ETFs, ETNs and ETCs.

It is clear that this market has grown dramatically and is undergoing a period of significant change. And the growth is expected to continue. Given these developments we identified certain challenges and risks for those participating in the commodities markets.

Challenges and risks for firms:

Recruiting and retaining staff with appropriate expertise

There is a limited pool of individuals with the appropriate level of commodity specific knowledge and experience from which firms can recruit. As many new firms have entered the market, and existing participants have expanded their operations, demand for these individuals has outstripped supply. This presents a challenge for firms in recruiting and retaining sufficient staff with the appropriate expertise.

Maintaining robust and appropriate risk management and risk modelling systems

Volatility has increased in some markets. Firms must fully identify all the risks they face and control them appropriately. Algorithmic trading systems should be thoroughly tested to satisfy firms of their appropriate behaviour in any given set of circumstances. Where firms are purchasing commodity infrastructure they need to be aware of the significant change in risk profile they are adopting.

Preventing market abuse

Given the increasing activity in commodities markets the FSA will focus more attention on monitoring them. There is no suggestion that these markets are more susceptible to market abuse than any other, but firms must ensure they act properly at all times.

New users

Otherwise-experienced firms and individuals new to commodities markets may not share the same level of insight into the behaviour of the markets as traditional participants. Conversely new user types are bringing previously unseen trading methods. All firms, and indeed exchanges, need to be aware of the effect this has on the markets.

Challenges and risks for exchanges:

Compliance resource

Exchanges face the same challenge as firms in recruiting appropriately skilled and experienced staff. Exchanges must ensure compliance functions remain appropriately resourced, especially given the large increases in volume seen across all commodity markets.

System capacity

Large increases in volume bring challenges for the infrastructure that supports trading. This is especially true as more exchange business switches to electronic platforms. The issue applies to data transfer systems and monitoring systems as well as the trading platforms.

Challenges and risks for consumers:

Suitability of investment

Retail participation is currently limited and commodities have traditionally been regarded as too volatile for retail investors. However, there is some interest in making more products available. A lack of experienced market professionals who fully understand the subtleties of the commodities markets may also be an issue. Consumers may be at risk of taking up investments whose risks they do not sufficiently understand.

Indirect exposure is growing

Indirect exposure of consumers through the assets that institutions hold on their behalf is already considerable and growing. If the total exposure of pension funds increases (as much as a 20% exposure has been mooted by some) the risk of a commodities-related financial failure affecting retail consumers may increase.

Conclusion

Past and continued future growth in the level of commodities investment, a raft of new products, and a changing user base have combined to create a significantly different commodities market environment in recent years, giving rise to a number of challenges and risks for those who participate in these markets. The risks identified in this paper should not come as a surprise to those active in the market, but none-the-less serve to focus attention on those areas we consider to be most important. Firms should consider how they have addressed these risks and ensure they continue to mitigate them in an appropriate manner.

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