

REFERENCE REPORT #32

ENERGY MARKETS GROW UP

PART II:

**WHO TRADES ENERGY NOW AND HOW
MUCH DOES IT MATTER?**

On July 18, 2007, The National Petroleum Council (NPC) in approving its report, *Facing the Hard Truths about Energy*, also approved the making available of certain materials used in the study process, including detailed, specific subject matter papers prepared or used by the Task Groups and their Subgroups. These Topic Papers were working documents that were part of the analyses that led to development of the summary results presented in the report's Executive Summary and Chapters.

These Topic Papers represent the views and conclusions of the authors. The National Petroleum Council has not endorsed or approved the statements and conclusions contained in these documents but approved the publication of these materials as part of the study process.

The NPC believes that these papers will be of interest to the readers of the report and will help them better understand the results. These materials are being made available in the interest of transparency.

The attached Topic Paper is one of 38 such working document used in the study analyses. Also included is a roster of the Subgroup that developed or submitted this paper. Appendix E of the final NPC report provides a complete list of the 38 Topic Papers and an abstract for each. The printed final report volume contains a CD that includes pdf files of all papers. These papers also can be viewed and downloaded from the report section of the NPC website (www.npc.org).

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Energy Markets Grow Up Part II: Who Trades Energy Now and How Much Does It Matter?

- A year ago, in a report called *Energy Markets Grow Up: How the Changing Balance of Energy Market Participation Influences Price*, we took a close look at who trades energy and why, and explained how the development of the financial energy market has changed the path of not only energy prices, but the shape of the futures curve and volatility. Here, we update that discussion, examine what has changed in the past year, and — in a market with so little hard data on money flows — attempt to quantify the role that some of these market participants play. Specifically, we estimate the per commodity inflows and outflows associated with index investment on a quarterly basis since 2002.
- Corporates, macro hedge funds and CTAs, and institutional investors all trade commodities in very different ways. It is important to consider the behavior of each type of market participant collectively in any period of time, since no one participant gives a complete picture of market activity and no one participant determines price. We discuss recent trends in producer and consumer hedging activity on *page 2*.
- Outside of producer and consumer risk management, there is a temptation to group all ‘speculative’ energy market participants together. Contrary to the way ‘speculative’ market participants have been portrayed, financial institutions, commodity trading advisors (CTAs) and macro hedge funds, and institutional investors are a diverse bunch. There is no reason to think that in any time period macro hedge funds and CTAs are behaving the same way as institutional investors — most of the time they are not. They enter the market from different directions, in different parts of the curve, and through different products (*see page 3*).
- The negative roll return associated with all index commodities except the base metals this year — and negative spot return in energy — mean that total returns year to date on pure GSCI® and DJ-AIGSM investments have been negative. However, we see no indication that institutional investors in commodities are ‘running for the door.’
- When thinking about whether money is entering or exiting commodity index-style investments, it is important to distinguish between inflows and outflows for rebalancing, and inflows and outflows for reallocating money between asset classes in the portfolio (or between commodities within the commodity allocation). Our experience is that institutional investors tend to reassess portfolio *allocations* relatively infrequently, but *rebalance* portfolios at least quarterly. As a result, in quarters when commodities perform poorly relative to other asset classes, we tend to see money flow into commodity indices to lift the commodity allocation back up to its target level (*see pages 5-6*).
- In the following sections we attempt to isolate the flow of money from rebalancing pure index positions to maintain fixed allocations to commodities. We also explore some of the strategies that investors are using to improve returns — and that banks are using to manage the risk associated with selling index style products to real money customers (*see pages 7-8*).

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A year ago, in a report called *Energy Markets Grow Up: How the Changing Balance of Energy Market Participation Influences Price*, we explained how the development of the financial energy market has changed the path of not only energy prices, but the shape of the futures curve and volatility.

Financial commodity markets are still young and dynamic, but have evolved significantly over the past several years. While physical fundamentals are still important, what could be called the ‘paper supply/demand balance’ — or, in other words, supply of and demand for deferred commodity price — is increasingly relevant in these young markets.

In *Energy Markets Grow Up* we took a close look at who trades energy and why. Here, we update that discussion, examine what has changed in the past year, and — in a market with so little hard data on money flows — attempt to quantify the role that some of these market participants play. Specifically, we estimate the per commodity inflows and outflows associated with index investment on a quarterly basis since 2002.

Who Trades Energy Today & Why

Corporates, macro hedge funds and CTAs, and institutional investors all trade commodities in very different ways. It is important to consider the behavior of each type of market participant collectively in any period of time, since no one participant gives a complete picture of market activity and no one participant determines price.

Producers & Consumers

The hedging behavior of energy producers and consumers is important because it determines, on both a macro and regional basis, the number of ‘natural’ longs or shorts in markets. A year ago, we noted that the behavior of the market’s traditional participants — producers and consumers — had changed as prices climbed.

In energy as well as metals, there has been a reluctance by producers to forgo upside opportunity by hedging in a rising price environment. The notable exception has been M&A associated hedging, which has in many cases become a matter of course as asset prices have risen. Consumers, meanwhile, have remained very active throughout the bull trend.

Both producers and consumers, when they have hedged, have shifted demonstrably to options-based strategies. Cash-rich producers have been inclined to pay premium for downside insurance, leaving the upside price potential limitless. Consumers have in general favored a combination of swaps, col-

lars, and three-ways — leaving the door open for at least partial participation in any potential price retracement. All corporates have had both the ability and inclination to hedge in longer tenors as overall market liquidity has improved.

While these broad themes remain very much intact, we have seen some changes in the past year and, most recently, in association with the third quarter oil and gas price corrections.

The downward correction in oil, and several months ago in natural gas, brought some producers into the market. As oil and gas prices have surged, new, higher cost production — that wouldn’t have been economical to pursue a few years back — has come online. When the natural gas price fell nearly 50% between end-July and end-September, and the oil price dropped 35% from mid-July to mid-November, a few higher cost producers were spooked into the market.

Additionally, the recent oil price decline has encouraged some producers to hedge oil price upside that would phase out Section 29 tax credits. Section 29 pays a tax credit to companies that produce and sell non-conventional or synthetic fuels, but phases out at high oil prices. Calls struck at or collars surrounding phase out levels compensate producers who lose the tax credit at high prices.

Most consumers hedge on a fairly rote schedule, legging steadily into hedges on a quarterly basis and typically targeting 75% cover one year forward, 50% cover two years forward, and 25% cover three years forward. In the past several years, as prices have climbed, we have seen increased flexibility in terms of the schedule on which hedges are added, and an increased preference for options based strategies.

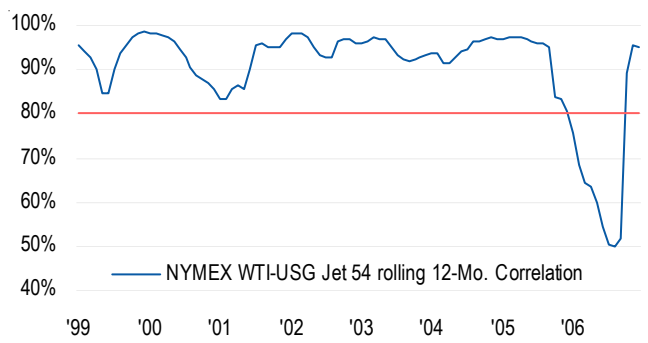
More recently, smaller consumers have joined the ranks of energy hedgers, as energy costs make up a higher percentage of both risk and costs in more businesses that previously were concerned only with managing foreign exchange and interest rate risk.

The steep contango in the oil curve poses an added challenge for consumers who, in addition to paying a high outright price for deferred contracts, also suffer a cost of carry. Some consumers have chosen to postpone hedging programs or shorten the tenor of the hedgers to, say, a three month horizon in response to the high cost of carry. However, some more sophisticated consumers have also recently been looking at longer dated hedges, in an attempt to avoid or reduce the contango effect by shifting buying to the flatter part of the curve. Improved liquidity, again, has enabled this shift.

One relatively new challenge for consumer hedgers is the breakdown in correlations between certain product pairs. Consumers who use relatively illiquid products such as diesel or jet

fuel for their business often look to hedge that exposure with more liquid, well correlated proxies such as gasoil/heating oil or crude, particularly for longer dated tenors. Hedge accounting rules require proxies to correlate at least 80% with the actual consumed product, however, which is a threshold that many pairs — such as US Gulf jet fuel and Nymex WTI or Nymex heating oil — broke in 2006. Hedging strictly with the consumed product in many cases introduces liquidity and tenor constraints.

Hedging Proxy Correlations Break Down



Source: JPMorgan Energy Strategy.

Pure Financial Players

Outside of producer and consumer risk management, there is a temptation to group all ‘speculative’ energy market participants together. In reality, these players fall into distinct categories that we would roughly define as:

- financial institutions
- commodity trading advisors (CTAs) & macro hedge funds
- institutional investors

Contrary to the way ‘speculative’ market participants have been portrayed, they are a diverse bunch. There is no reason to think that in any time period active hedge funds are behaving the same way as institutional investors — most of the time they are not. They enter the market from different directions, in different parts of the curve, and through different products.

Hedge funds in recent years have not only committed more money to the commodity space but have also become increasingly sophisticated in terms of how they trade commodities, focusing not only on directional views but relative value trading in longer dated tenors, and volatility plays.

Since 2003, there has been an increasingly punctuated end-year downward price correction in oil that we believe is at least partly attributable to profit taking by ‘active’ speculative traders. That correction came earlier than usual in 2006 and reflects — among other things — hedge fund selling in the front of the curve to protect length in the back of the curve, as opposed to an outright liquidation of deferred positions.

Institutional Investors

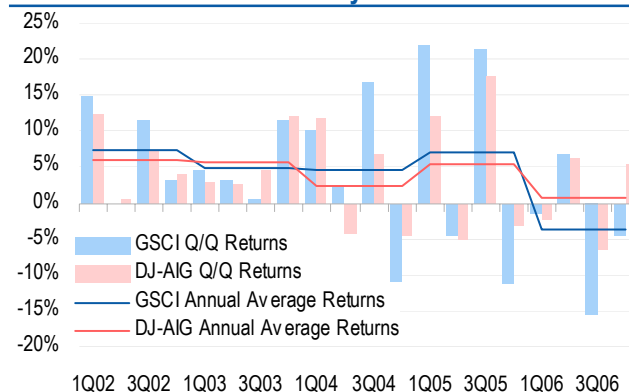
Institutional investors — a group distinct from other, more active financial participants — are the newest entrants to the energy space, and possibly the most poorly understood. During a period of low interest rates and relatively few opportunities in traditional investment arenas, the notion of commodities as an asset class and vehicle for portfolio diversification has caught on, aided by a supportive fundamental bull story that has become prominent even in the mainstream media. This group includes pension funds, mutual funds, and even retail investors who may have a broad, macro view of the sector but little expertise in the intricacies of these markets.

Investor products, such as commodity indices, commodity-linked notes, and exchange-traded funds (ETFs) give the non-expert an opportunity to add commodity exposure to a diversified portfolio. The indices, such as the Goldman Sachs Commodities Index® and the Dow Jones AIG Commodity IndexSM, are long-only baskets of commodities and have been the most popular product for passive participation in the commodities space. The ratio of commodities in the basket is set for branded index products — the DJ-AIGSM Index, for example, includes roughly equal weightings for energy, metals, and agricultural products, whereas the GSCI® weights the energy component more heavily.

Length in these branded index products is held in the second or third month futures contracts, and rolled every month or every second month as those contracts approach maturity. In this way, an index position could, under the proper circumstances, make money in two ways: a ‘spot return’ is earned when the outright prices of the underlying commodities go up, and a ‘roll return’ is earned when the futures curves of the underlying commodities are downward sloping.¹

The negative roll return associated with all index commodities except the base metals this year — and negative spot return in energy — mean that total returns year to date on pure GSCI® and DJ-AIGSM investments have been negative.

GSCI® & DJ-AIGSM Commodity Index Returns



Source: JPMorgan Energy Strategy.

¹For a more detailed discussion of how commodity indices work, please see *Energy Markets Grow Up: How the Changing Balance of Energy Market Participation Influences Price*, published September 2005 by Global Energy Strategy.

Who Trades Energy Derivatives and Why?

Participant	Active or passive? Buyers or sellers? New or old?	Activity versus 3 years ago?	Recent Trends
Energy Producers (E&P companies)	Sellers — The natural sellers in the energy markets. Producers typically hedge 2-3 years out but can now find sufficient liquidity to hedge as much as 7 years out. Old — Active hedgers since the early-1990s. Active — May trade anywhere from daily to annually depending on hedging program	Down — Significantly less day-to-day tactical hedging at high prices. Remaining deals are large, occasional, one-off M&A related strategic hedges. Options strategies generally preferred over swaps, for downside protection with upside exposure.	<ul style="list-style-type: none"> Some heightened interest in forward selling from high cost producers as prices have dipped. Section 29 hedging has also featured prominently in recent period.
Energy Consumers (Utilities, airlines, railroads, industrials)	Buyers — The natural buyers in the energy markets. Consumers typically hedge 1-3 years out, but increasingly may go out as far as 5-7 years in products with sufficient liquidity. Active — May trade anywhere from daily to annually depending on hedging program. Old — Active hedgers since the early-1990s.	Up — If anything, consumers have hedged more actively as prices have risen. The percentage of hedges done with options rather than swaps has increased to guarantee upside protection with downside participation.	<ul style="list-style-type: none"> Increased flexibility in timing of hedge execution. Significant interest on price dips. More involvement from small consumers as energy takes bigger share of business risk and cost structure. Shift towards hedging specific risk exposure as traditional 'proxy hedge' correlations break down.
Financial institutions (Banks)	Buyers or sellers — Depending on customer business and view of the market. Banks may make markets as far as 10+ years forward. Active — Trade daily making markets (flow and structured business) and/or taking risk (proprietary trading). May have long or short term prop views. Old — Although the mix of banks in energy changes, banks have been market-makers and risk takers in energy since the inception of these markets.	Up — Interest has arguably increased with price. A larger number of banks are committing more resources to the energy space.	<ul style="list-style-type: none"> No significant change. Increased focus on investor business at many institutions.
Trend Players (Commodity Trading Advisors)	Buyers or sellers — Depending on market trend. Active — Fast moving, directional, tend to enter and exit positions quickly. Old — CTAs have traded energy for years.	No significant change.	<ul style="list-style-type: none"> No significant change.
Macro Hedge Funds	Buyers or sellers — Depending on view of the market. On average in recent years, hedge funds more long than short given price trend. Funds may participate in any part of the curve and have shown particular interest in owning deferred price and volatility, adding liquidity and price clarity to that part of the curve. Active — Take proprietary risk daily. May have long or short term views, and take directional or relative value positions in the full range of energy products. Old and new — Not new to energy per se but more professional and putting more money towards this space in the last ~3 years.	Up — Generally more dollars in energy, but also more sophisticated and varied involvement in full range of energy products.	<ul style="list-style-type: none"> End-year profit-taking came early this year, and was characterized by selling in the front of the curve to hedge deferred length. Little liquidation of long-dated positions was observed. Exiting of one large risk taker had some notable impact on curve structure and volatility in natural gas but was reasonably well absorbed in the market.
Institutional Investors (‘Real money’ pension funds, mutual funds, retail investors)	Buyers — Institutionals enter the market almost exclusively from the long side via products like Commodities Indices and oil-linked notes. Passive — Take long-term, generally directional views. Tend not to enter or exit positions on short-term price fluctuations. New — Institutional investors have really only started to participate in the energy space in the past ~3 years.	Up significantly — Major inflow of money and interest in commodities as an asset class that really did not exist in a meaningful way 3 years ago.	<ul style="list-style-type: none"> Negative performance relative to other asset classes in Q3 meant significant inflows for rebalancing at the end of the quarter. Ongoing interest seen in commodities as an asset class; fresh allocations expected in the new year.

However, we see no indication that institutional investors in commodities are ‘running for the door.’ Most institutional investors in commodities view the allocation as a long term one. Major pension funds have allocated anywhere from 2-5% of their portfolios to commodities in recent years — a significant addition to what are still relatively shallow markets, but not a

huge portion of their total investments. The reasons for making a portfolio allocation to commodities — such as portfolio diversification, and to hedge inflation or event risk — are still broadly intact.

And, importantly, we can’t assume individual investors in commodities have not performed well this year because traditional

branded index products have underperformed. Many institutional investors are getting increasingly sophisticated in the commodities space, and using traditional indices as a benchmark to beat using enhanced products and even active trading of swaps and options.

In the following sections we attempt to isolate the flow of money from rebalancing pure index positions to maintain fixed allocations to commodities. We also explore some of the strategies that investors are using to improve returns — and that banks are using to manage the risk associated with selling index style products to real money customers.

Modeling the Ins and Outs of Index Investment

Isolating Flows: Rebalancing Versus Reallocation

When thinking about whether money is entering or exiting commodity index-style investments, it is important to distinguish between inflows and outflows for rebalancing, and inflows and outflows for reallocating money between asset classes in the portfolio (or between commodities within the commodity allocation).

Say, for example, that a fund has decided to allocate a constant 3% of its portfolio to commodities for a full year, regardless of market performance. Although the fund's *allocation* to commodities will not change, as asset values fluctuate, money will need to be injected or withdrawn from the commodity investment on a regular basis in order to maintain that constant 3%. The amount of money added or withdrawn is a function of the performance of the commodity component relative to other asset classes in the portfolio.

Our experience is that institutional investors tend to reassess portfolio *allocations* relatively infrequently, but *rebalance* portfolios at least quarterly. As a result, in quarters when commodities perform poorly relative to other asset classes, we actually tend to see money flow into commodity indices to lift the commodity allocation back up to its target level.

Doing the Math

On this basis, we made some basic assumptions to estimate both inflows/outflows due to rebalancing, and inflows/outflows due to reallocation over the past four years:

1. We assume that institutional investors only change their portfolio allocations on an annual basis, on January 1. For the market as a whole, we calculated the total allocation to commodities indices as a function of the following assumptions about the amount of money in index-tracking products, and the total assets under management in the institutional investor space:

Assumed Market Commodity Allocations

(bn \$)	Assets Under Management	Commodity Allocation (\$)	Commodity Allocation (%)
2002	6389	10	0.2%
2003	6586	20	0.3%
2004	6790	40	0.6%
2005	7000	70	1.0%
2006	7210	100	1.4%

Source: JPMorgan Energy Strategy.

We also make rough assumptions about the market's allocations to non-commodity assets, which in our model include domestic/international equities, domestic/international bonds, cash, and non-commodity alternatives.

In practice, of course, some funds initiate or change allocations to commodities or other asset classes at times other than the beginning of the year, but we assumed that changes in allocations are 'lumpy' in this way in order to isolate reallocation flows from rebalancing flows.

2. We assume that institutional investors rebalance portfolios on a quarterly basis, at the change of the quarter. While some funds in fact rebalance more frequently — even daily, in some cases — anecdotally we do see bigger flows at the change of the quarter, and get a good sense of trend over time from this simplification.

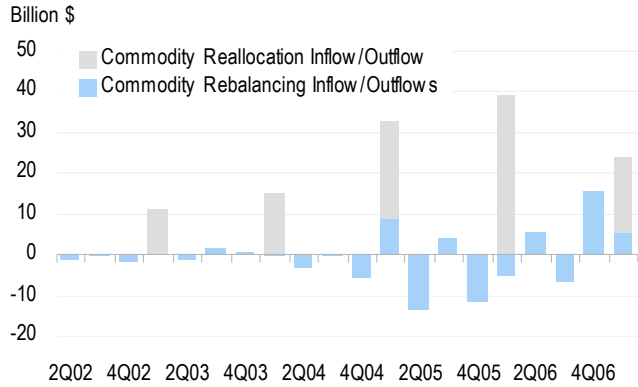
3. We assume that 100% of the commodity allocations specified above are held in either vanilla GSCI® or DJ-AIGSM index positions, and assume that, since 2002, the percentage of these funds in the DJ-AIGSM index has increased relative to GSCI®.

In our model, we track the quarterly returns of each asset class to make a back of the envelope calculation of the amount of money, and ultimately the number of contracts per commodity that are added or subtracted each quarter.

Based on these calculations, as much as \$11.5bn has exited commodity positions and as much as \$15.6bn has entered commodities in certain quarters purely for rebalancing. Looking at energy specifically, as much as \$7.8bn has been added or subtracted in certain quarters for rebalancing.

Looking more closely at the transition from the third to fourth quarter in 2006, we see that — after returns of -15.5% in the GSCI® and -6.5% in the DJ-AIGSM — a universe of funds looking to maintain a constant allocation to commodities would have had to buy some \$15-16bn of commodities to maintain the 1.4% allocation we have assumed for this year. Based on the flows we observed on our desk, that number seems about right. Fourth quarter returns suggest that some \$5bn would need to enter commodities to maintain 2006 allocations — absent any change in portfolio allocations in the New Year.

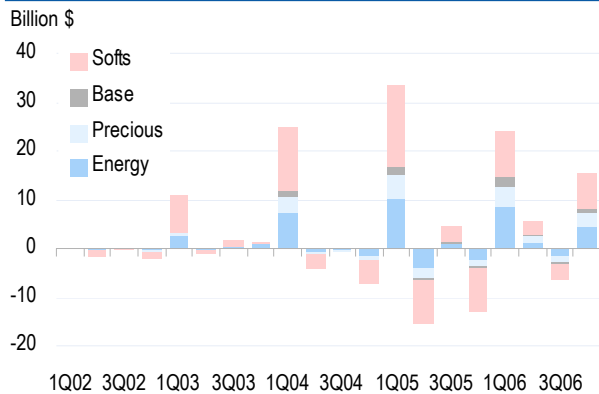
Quarterly Commodity Index Flows



Source: JPMorgan Energy Strategy.

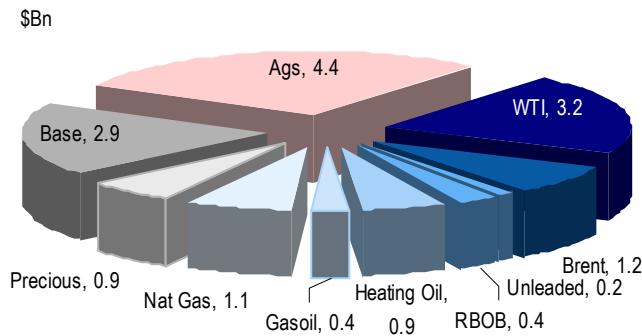
Between the commodities, that buying would have broken down as shown in the charts below:

Quarterly Flows By Commodity Type



Source: JPMorgan Energy Strategy.

Q3'06 Rebalancing Inflows By Commodity Type



Source: JPMorgan Energy Strategy.

Fine Tuning the View

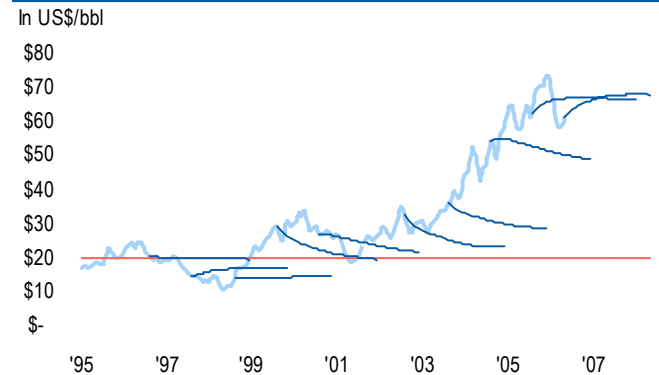
Our model paints an overly simplistic picture of today's investor community. As steep energy market contango has trimmed returns in the energy-heavy GSCI®, the investor community has increasingly fine tuned the way it approaches this asset class. Far from leaving the space altogether as index returns falter, we are instead seeing institutional investors take a more sophisticated approach to commodities investment.

The first and easiest shift investors made to beat flagging GSCI® returns was to reallocate between commodities, either by shifting to an index with a lighter energy weight — which is represented in our model as a gradual shift away from GSCI® and towards DJ-AIGSM — or by artificially changing the product mix by adding overlays, such as swaps, to a traditional index position.

Notably, institutional investor participation in commodities is no longer exclusively from the long side (though, by and large, is still certainly more long than short). Additionally, the most sophisticated institutional investors are also looking beyond the commodity mix, to deferred parts of the futures curves, to find value. The increased liquidity in many commodities markets now accommodates passive investment in the deferred part of the forward curves, where it previously did not.

It used to be that the back of the oil curve, for example, was more or less pinned at \$20 and only the very front of the curve — effectively the spot price — moved up and down in response to supply/demand fundamentals, geopolitics, or other market drivers. When the spot price was above \$20, the curve sloped down towards that long term average, and when the spot price was above \$20 the curve sloped up. Today, we see a much flatter term structure and more or less parallel moves in the curve when the outright price level changes.

West Texas Intermediate Price History



Source: JPMorgan Energy Strategy.

While an investment in the deferred part of the crude curve still does not participate 100% in spot price moves, it does participate much more fully than it would have several years

ago. From 1995-2003, the crude price one year forward moved 40¢ for every \$1 move in the spot (R^2 0.62) and the price two years out moved 28¢ for every \$1 move in the spot (R^2 0.42). Since 2004, the one year forward price has moved 72¢ for every \$1 move in the front (R^2 0.85) and the two year forward has moved 61¢ for every \$1 spot move (R^2 0.75).

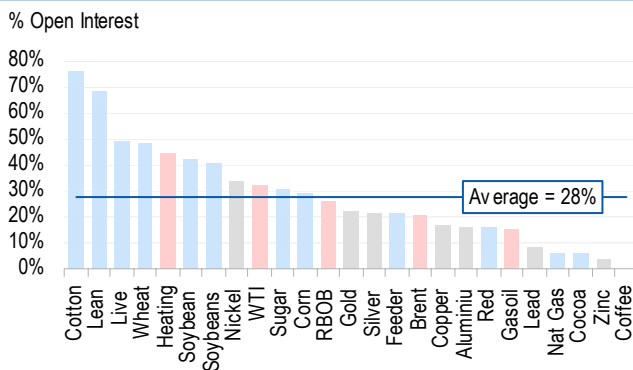
How Much Money Is ‘A Lot’?

So we know that commodity markets are deeper than they used to be. Assuming our rough calculations are in fact a decent reflection of the amount of money contributed by institutional investors, the next question is whether or not those sums are ‘a lot’ of money for markets this size.

The easiest way to gauge whether the notional amount of money held by real money investors in each commodity is sizable is to compare these investments to the open interest in each commodity futures strip.

Not surprisingly, among the commodities, several of the agricultural products are most ‘crowded’ in terms of index investment as a percentage of open interest. These markets are less liquid than the other commodities. Among the energy products, West Texas Intermediate is most crowded with notional index investment equivalent to some 32% of open interest on average last year, *had all index investment been reflected directly on the futures exchange*.

Per Commodity Index Investment: Open Interest



Source: JPMorgan Energy Strategy.

However, the comparison to open interest is misleading, as index business is done largely over the counter. If all index counter parties immediately laid off the risk of those trades by replicating the indices in the futures market, the comparison would be valid. While some counterparties, in theory, may simply ‘broker’ index business by charging a set commission for index trades and immediately offlaying that risk by replicating the index in the futures market, that is not typical of how this business is done. Institutions that warehouse risk, such

as commodity derivatives businesses at banks, are obligated to replicate licensed indices with respect to settlement with counter parties, but need not replicate indices in terms of how they manage the risk of effectively being ‘short’ an index to a customer.

For example, if a bank likes the risk associated with being short an index, it may choose not to lay off any of the position created by selling an index to a counter party. In fact, a bank would have earned \$15bn by shorting \$100bn of GSCI® in 2006.

Similarly, the ‘short index’ position could be offset naturally by other flows — from hedge fund or corporate customers, for example — that the bank sees. Finally, a bank may choose to reduce the risk associated with the short index position by replicating an index style trade in a different way than is designated by the licensed indices.

The GSCI® and DJ-AIGSM specify that commodity length is held in the first two or three futures contracts according to specific commodity weightings, and rolls from one contract to the other on designated days each month. The returns that investors receive from a branded index position must mirror these parameters, but the bank dealing the index may choose to lay off the risk of these positions in different ways — not unlike how many investors are now looking to add value to traditional index positions themselves by altering product mix, roll dates, or tenor. Simply put, if a bank can ‘beat’ the index return that customers receive, they pocket the difference.

Changing commodity allocations is one way to manage this risk that allows a bank to not only express a view on the relative value of the commodities and complement other business flow, but also to reduce transaction costs by concentrating risk in deeper ‘proxy’ markets and avoiding commodities that are less liquid.

Changing roll dates was also a very effective way of ‘beating’ branded index returns in 2004 and 2005, but, as more market participants took advantage of this strategy, its effectiveness has been reduced.

Perhaps the most prolific way of managing the risk associated with doing index business has been to lay off ‘shorts’ in the front of the curve with length in the back. In fact, this is one way in which index business — though notionally concentrated in only the front three contracts of the futures curves — has actually had a significant knock-on effect on longer dated forwards (and, specifically, added support to the back of the curve in recent years).

There are several reasons to distribute index risk throughout the forward curve — for one, the combined liquidity of the entire curve is greater than the liquidity offered by the front contracts alone, even though the front contracts are the most liquid of the strip.

Additionally, buying longer dated contracts and rolling, say, every three or six months instead of every one or two months reduces the transaction costs associated with maintaining the index portfolio.

Perhaps most importantly, managing index risk in the deferred part of the forward curve avoids the steepest part of the contango in many commodities, such as crude. Even as the contango in the crude curve has moved steadily from the very front contracts two years ago to some 18 months out the curve today, the most severe negative carry is still in the near months. In fact, a bank that ‘sold’ the WTI component of the GSCI® index for a customer would have paid out a cumulative \$6.65 per barrel to the customer since January 2004 but earned a cumulative \$44/bbl by replicating that same trade in the 13th-14th month contracts over the same period of time.

Summing Up the Pieces

It used to be that the energy derivatives market was dominated by producers and consumers hedging price exposure. Both producers and consumers have a ‘natural’ position in the market — it is the business of a producer of energy to sell it, and a consumers business to buy regardless of their view of market drivers or outlook for price. Historically, financial institutions bridged any gap between the number of would-be buyers and sellers of energy at any given time by appropriately pricing the risk they took to balance that mismatch.

One definition of ‘speculator’ is simply a market participant who has no natural market position, but instead can buy *or* sell energy to express a discretionary view on supply/demand fundamentals, geopolitical risk, technicals, or other market drivers.

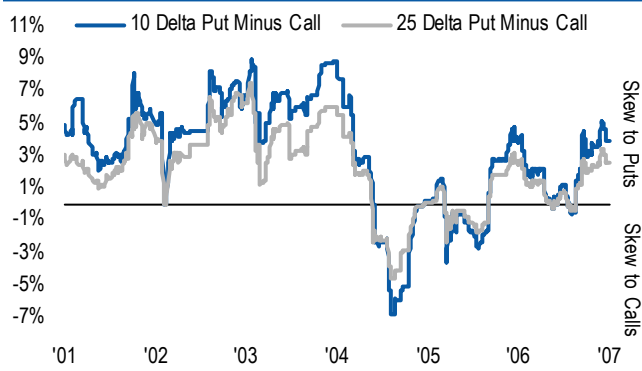
Speculative participants in energy markets add liquidity by providing another match for producer and consumer deals. They contribute to the balance of buyers and sellers in the market at any given time.

In our last report, we suggested the volatility skew — shown here for the West Texas Intermediate 12-month strip — provides a rough representation of that balance of buyers and sellers.

The volatility skew shows the relative cost of puts and calls struck at equal deltas; in the chart below, a value above zero indicates that the put is more expensive, and a negative value indicates that the call is more expensive. Historically, crude puts were always more expensive than calls, because producer

hedging business dominated market flow. In 2004-05, the skew shifted to the call side reflecting not only a sharp slowdown in producer hedging but also the marked increase in the number of market participants willing to pay a premium to reserve the right to buy oil at a certain price, relative to the number of participants looking to reserve the right to sell. More recently, puts have again become more expensive than calls, as some producer hedging resurfaced and macro fund activity slowed at year end.

Rolling 12-Month Implied WTI Volatility Skew (%)



Source: JPMorgan Energy Strategy.

Flow of money also plays a big role in determining the shape of the forward curve. We believe that oil market contango — or, more generally, the high relative price of long dated forwards — is sustainable at high outright price levels. But we also believe that a meaningful price decline — say, a sustained move below \$55/bbl spot West Texas Intermediate and towards \$50/bbl — would see a significant flattening of the curve, and ultimately a return to backwardation. (We do not expect natural gas to mirror this trend, since seasonality features so prominently in that curve).

If prices were to make a compelling move lower, we would look for a sharp increase in producer selling — and a looser commitment from hedge funds and CTAs to their deferred length that has so effectively absorbed what producer hedging we have seen over the past few years. This shift would pressure the deferred part of the curve. At the same time, consumers may postponed additions to their hedging programs beyond the very short-term.

No one market participant — including institutional investors — determines energy prices, but collectively, market participation does influence not only price but the shape of forward curves and the price of volatility.

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