

# New Oil Market Realities

*Demand/Supply Balances, Macroeconomic Pressures, and Financial Flows*



**RESEARCH**

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## The Oil Outlook

- Demand: Global economic downturn, new demand outlook
- Supply: Spare capacity, cost deflation
- Macro Factors: Inflation expectations, dollar depreciation
- Financial Flows: Rise of passive index investors and retail ETFs

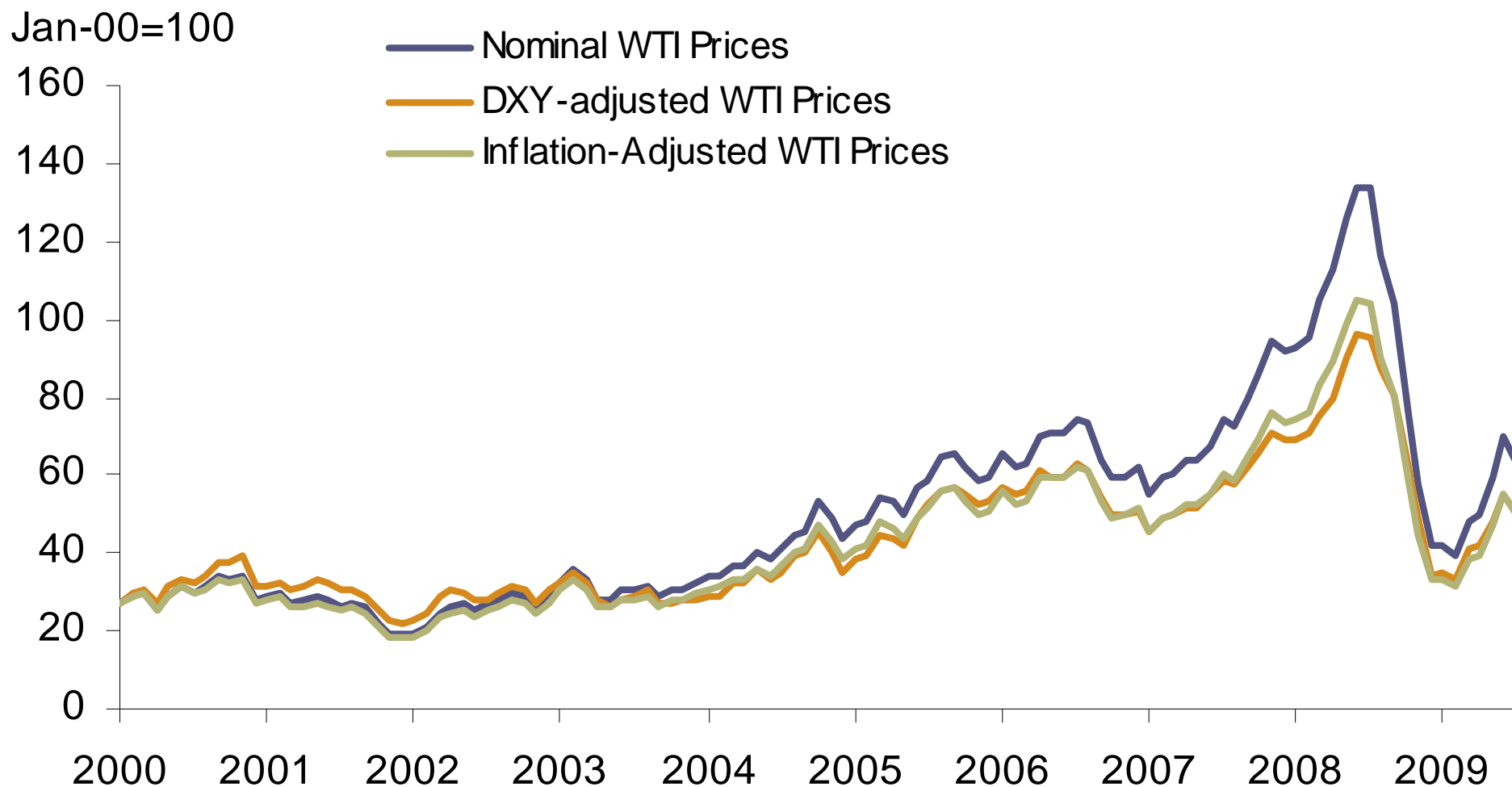
# Demand Outlook

High prices and global economic downturn has accelerated demand destruction

## Oil prices peaked in July 2008, plunged, then bounced back

WTI reached an all-time high of \$147.27/bbl, but the price in real terms (2000\$) topped out at \$96.84. The 36% slide in October was the largest monthly drop ever, but prompt prices rebounded sharply to half the 2008 peak.

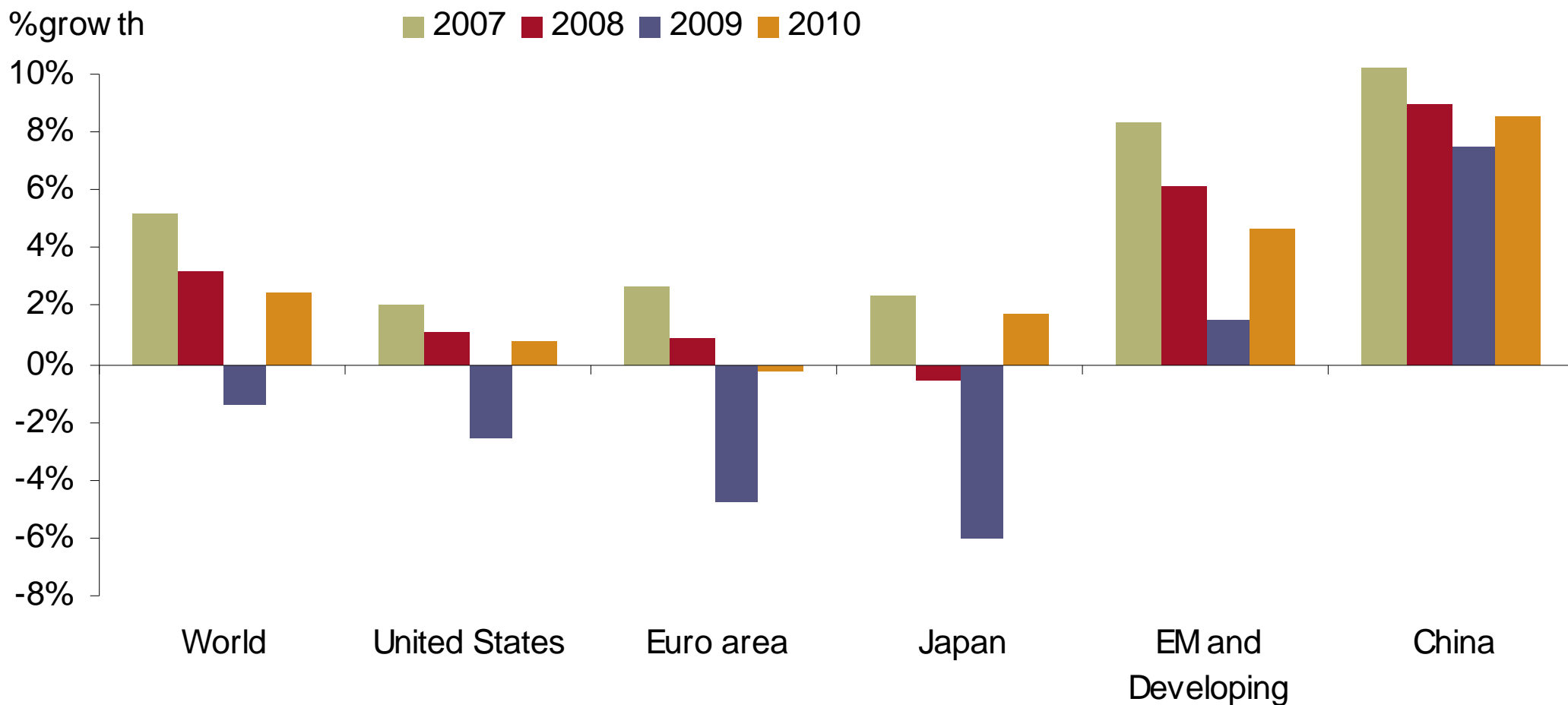
Real and nominal WTI (2000-09 monthly average)



# IMF GDP forecasts for major economies

EU and Japan near-term worse than US; China is a rare bright spot

IMF July 2009 World GDP Forecasts

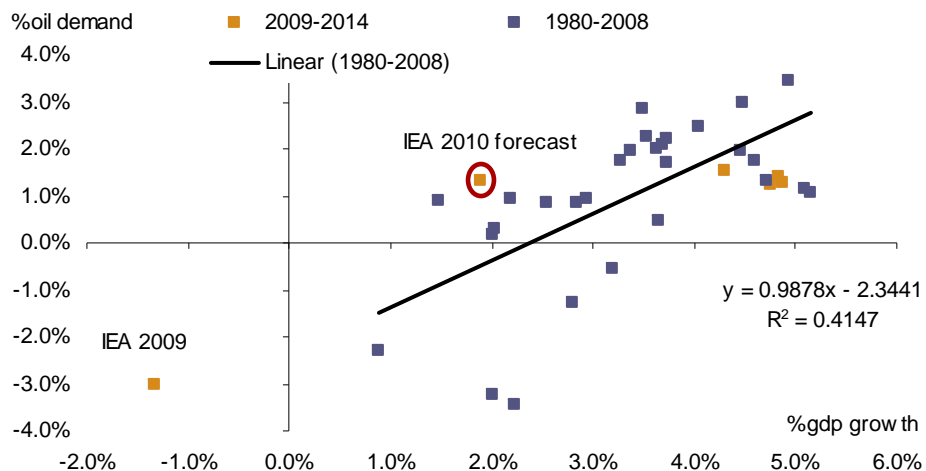


# Global recession will weigh down oil demand recovery

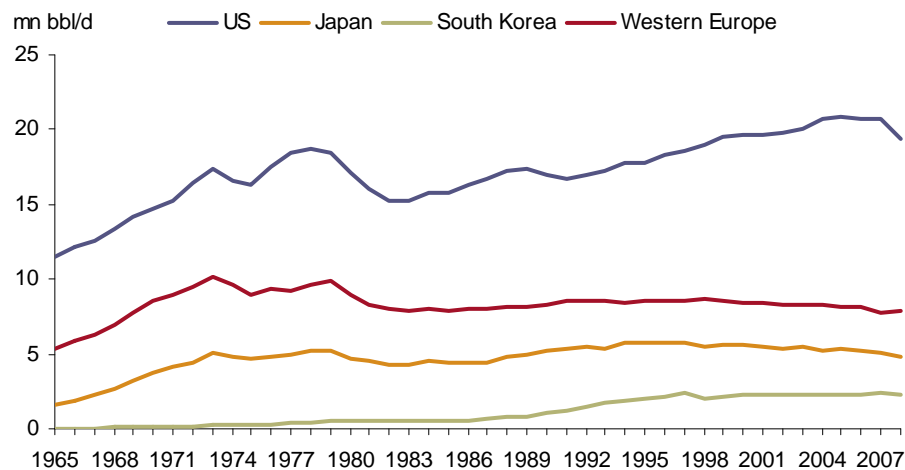
History suggests continued demand destruction into 2010, and slow recovery

- ◆ Even the historic relationship suggesting that the IMF forecast for 2.5% growth in 2010 would predict a +0.2% demand growth, is likely overshooting to the high side
- ◆ The aftereffects of the 2008-09 oil price surge will affect continued movements toward conservation and efficiency that will weigh down demand for several years
  - Japan and W. Europe’s oil demand peaked in 1979, and S. Korea in 1997
- ◆ Oil demand recovery after a price spike and recession is typically on a lower trajectory than prior to the crisis
- ◆ We think the IEA’s 2010 forecast for +1.7% demand growth (or +1.4mb/d) in 2010 and similar levels thereafter, and the new paradigm calls for 800k-1mb/d growth

**World Real GDP to Oil Demand Relationship**



**Peaking of oil demand in advanced economies**

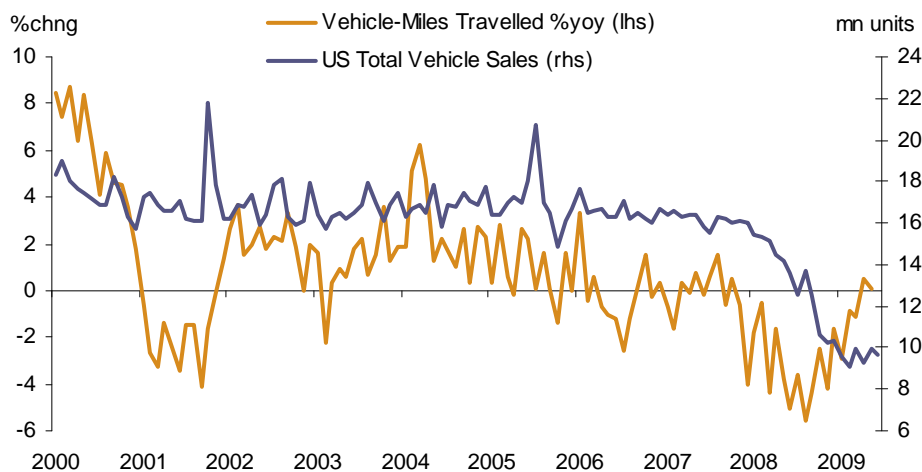


# US gasoline demand has peaked in 2007

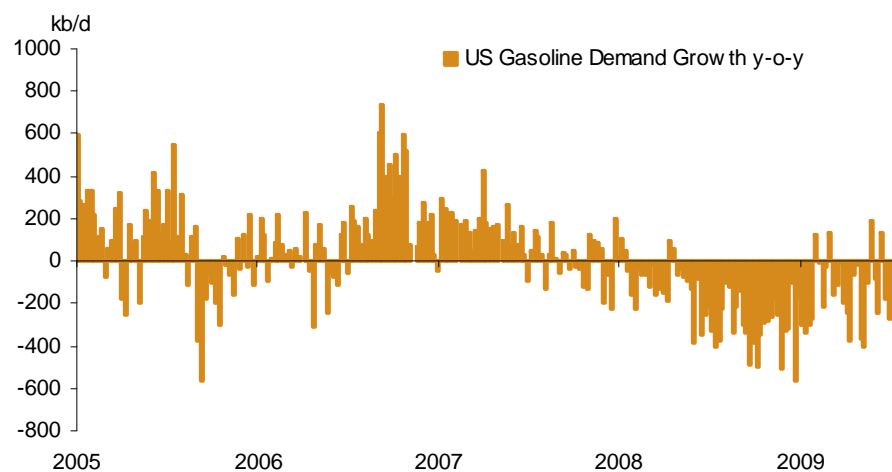
Structural shifts in US will cause permanent demand destruction

- ◆ US gasoline demand was a major driver of global demand from 1990 to 2005 (25% of global product demand growth), but started leveling off with the economic downturn in late 2007
- ◆ The fall in vehicle miles travelled and automobile sales, accelerated by changing demographics and higher retail gasoline prices, occurred even prior to the 2007 downturn
- ◆ The US renewable fuels standard, mandating bio-fuels in transportation, further eroded demand for conventionally sourced motor gasoline, with ethanol requirements increasing to 20% by 2010. Analysis of volumetric ethanol input demonstrates that US conventional gasoline demand peaked in 2004 at 9.25mb/d falling to 8.9m b/d in 2007.
- ◆ The Energy Independence and Security Act of 2007 imposes new CAFÉ standards, rising annually from 2011 to 2020, imposing 35 mpg limits for both cars and SUVs; combined with ethanol mandate and holding VMT constant, the result is roughly 1.35mb/d reduction in gasoline demand by 2015
- ◆ The recession and cash-for-clunkers programs are accelerating fleet efficiency gains with consumer switching from SUVs and light trucks to more efficient compact cars
- ◆ The recent election of the Obama administration opens prospects for accelerated CAFÉ standards by 4% per annum, plus plug-in hybrid subsidies, tax credits

**US Vehicle Sales and VMT**



**US Gasoline Demand Growth**



We share current views that demand will decline by >2m b/d in 2009, but believe a new paradigm replaces the older view

**The old paradigm:  
1.5 to 1.7m b/d demand growth**

- ◆ US: +300k b/d (1.5%), led by gasoline
- ◆ Other OECD: +100k b/d (0%)
- ◆ China: +500k b/d (6-7%)
- ◆ Middle East: +300k b/d (5-6%)
- ◆ India: +150k b/d (5-6%)
- ◆ Other Non-OECD Asia: +100k b/d (2%)
- ◆ Latin America: +100k b/d
- ◆ Africa + FSU: +100k b/d

**The new paradigm:  
0.8 to 1.0m b/d demand growth**

- ◆ US: 0-0.5% (100k b/d), with gasoline demand excluding biofuels, plateaued at 2007 levels
- ◆ Other OECD: 0k b/d (0%)
- ◆ China: +300k b/d (3.5-4%), with end to energy intensive industry subsidies
- ◆ Middle East: +150k b/d (4%), with end to hyper-growth for electricity, shift from oil to gas for power generation
- ◆ India: +100k b/d (3-3.5%)
- ◆ Other Non-OECD Asia: +50k b/d (1%) with market reforms
- ◆ Latin America: +100k b/d
- ◆ Africa + FSU: +100k b/d

## Demand Takeaways

Discretionary and non-discretionary demand destruction will ease supply calls

- ◆ The US has joined the rest of the OECD as a non-demand growth country, with gasoline demand having peaked in 2007 for at least the foreseeable future and possibly indefinitely
- ◆ The end of one-off factors will trim Middle East product demand growth, especially as hyper growth subsides and the need for oil in power generation is reduced or eliminated
- ◆ The elimination or reduction of product price subsidies will significantly reduce the demand/GDP elasticity in most Asian emerging markets
- ◆ The end of China's promotion of energy-intensive industries and the reduction of price subsidies will significantly reduce that element of China's oil demand
- ◆ It's likely that when oil demand growth resumes, it will be at a lower global rate than 1.8%; the question is how much lower?
  - A conservative estimate for the new demand growth path is 1.2% (or ~1mb/d), and 1% or 850kb/d growth path is possible
- ◆ A realistic appraisal of future demand growth implies a lower requirement for new supply

# Supply Outlook

High production spare capacity and cost deflation

## The ingredients of continued supply growth are in place

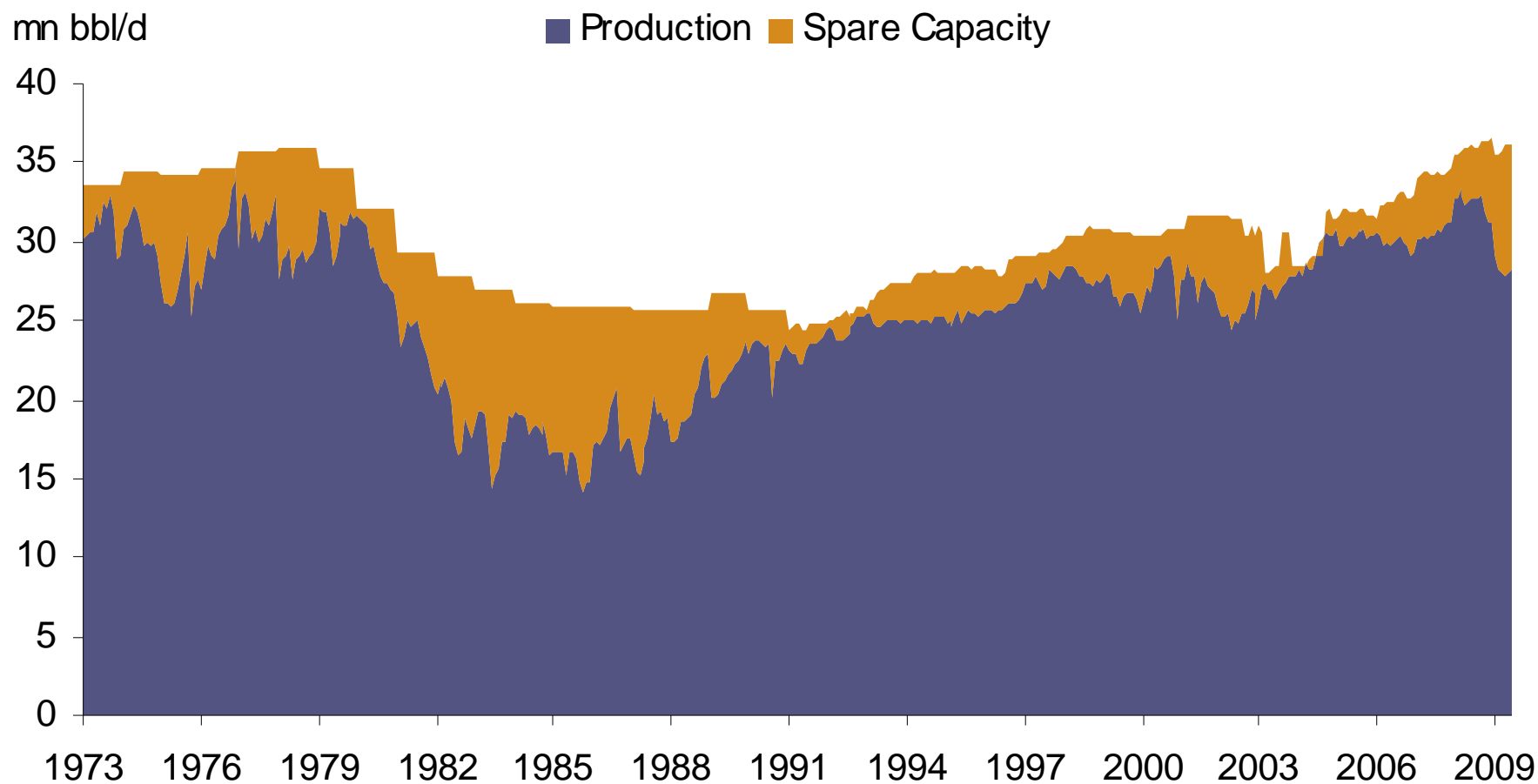
The short-term supply picture is little worsened by the global economic downturn

- ◆ Some have raised fears of credit constraints forcing a fall in upstream capital expenditures, leading to an even worse supply outlook, the “boomerang” theory
- ◆ But actually, investments made earlier this decade (particularly a ramp-up in Saudi Arabia starting in 2003) has provided a significant spare capacity cushion
- ◆ Furthermore, significant new sources of non-OPEC supply has been identified (notice how much of this is offshore):
  - Perhaps most famously, the Santos Basin in offshore Brazil
  - But also, offshore West Africa, particularly Angola
  - Arctic five littoral states: US, Canada, Denmark, Norway, UK and Russia
  - Deepwater OCS in GoM
  - Deepwater Caspian
  - Offshore NW shelf of Australia and Indonesia
- ◆ OPEC has been fairly successful in meeting quotas and cutting back supply (~3mbd), but now tensions exist as prices have rebounded
- ◆ The easing of infrastructure bottlenecks, the achievement of economies-of-scale, and technological advances have contributed to rapid cost deflation

## Spare capacity at historic highs with declining demand and completed projects

Saudi Arabia, other OPEC countries surprised by declines in Venezuela, Iraq and Nigeria and accelerated upstream projects in early 2000s. Now, >5mbd capacity in Saudi Arabia alone

There are good reasons to believe spare capacity will continue to grow



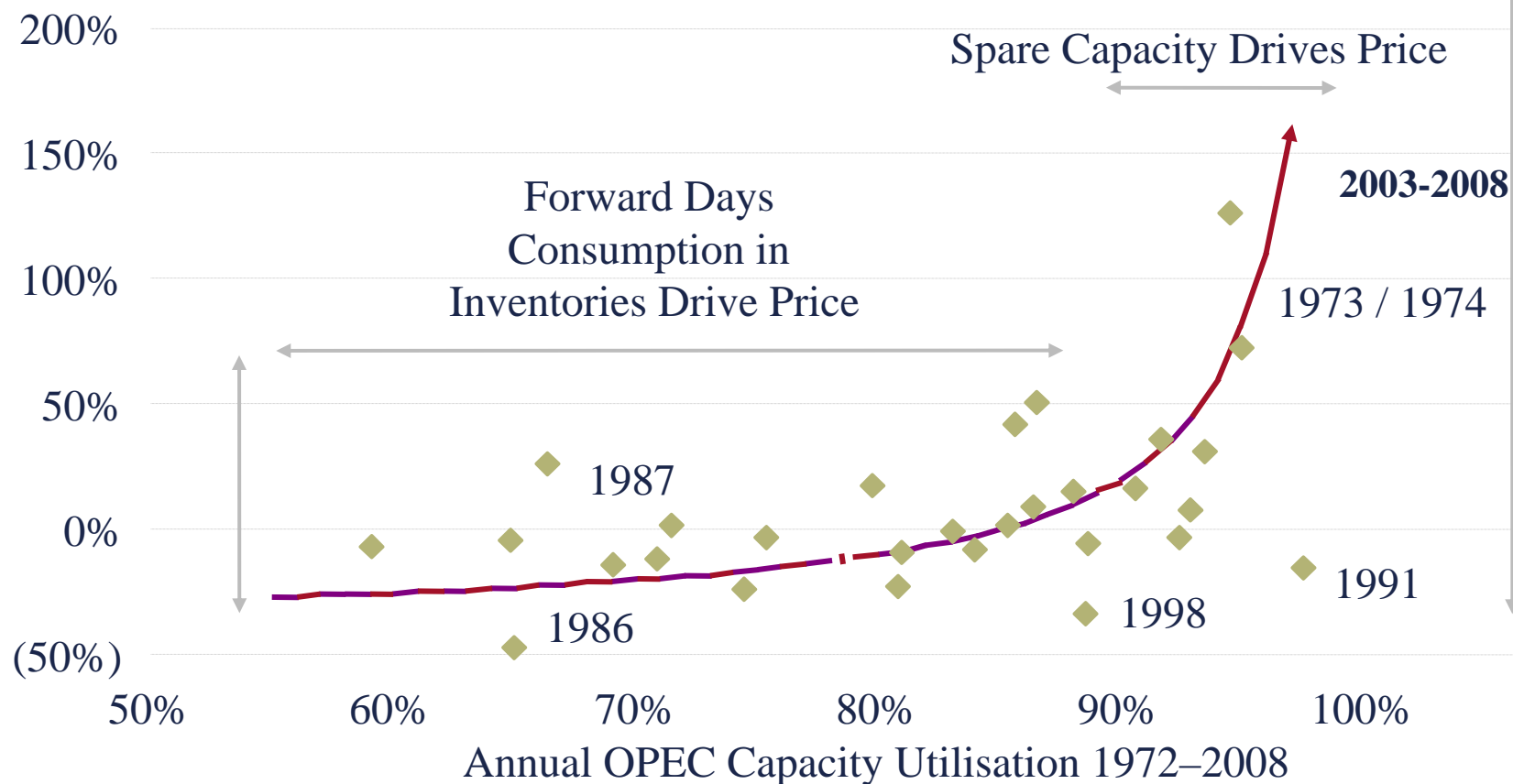
Source: EIG, U.S. DOE/EIA; LCMC Estimates

## Inventory forward cover and spare capacity provide fundamental direction to oil price movements

An inventory overhang can cause lower prices and steep contango. On the other side, low spare capacity cause tight and hypersensitive markets

**In Soft Markets, Inventories Count; in Tight Markets, Capacity Counts**

Annual % Change in Real Oil Price

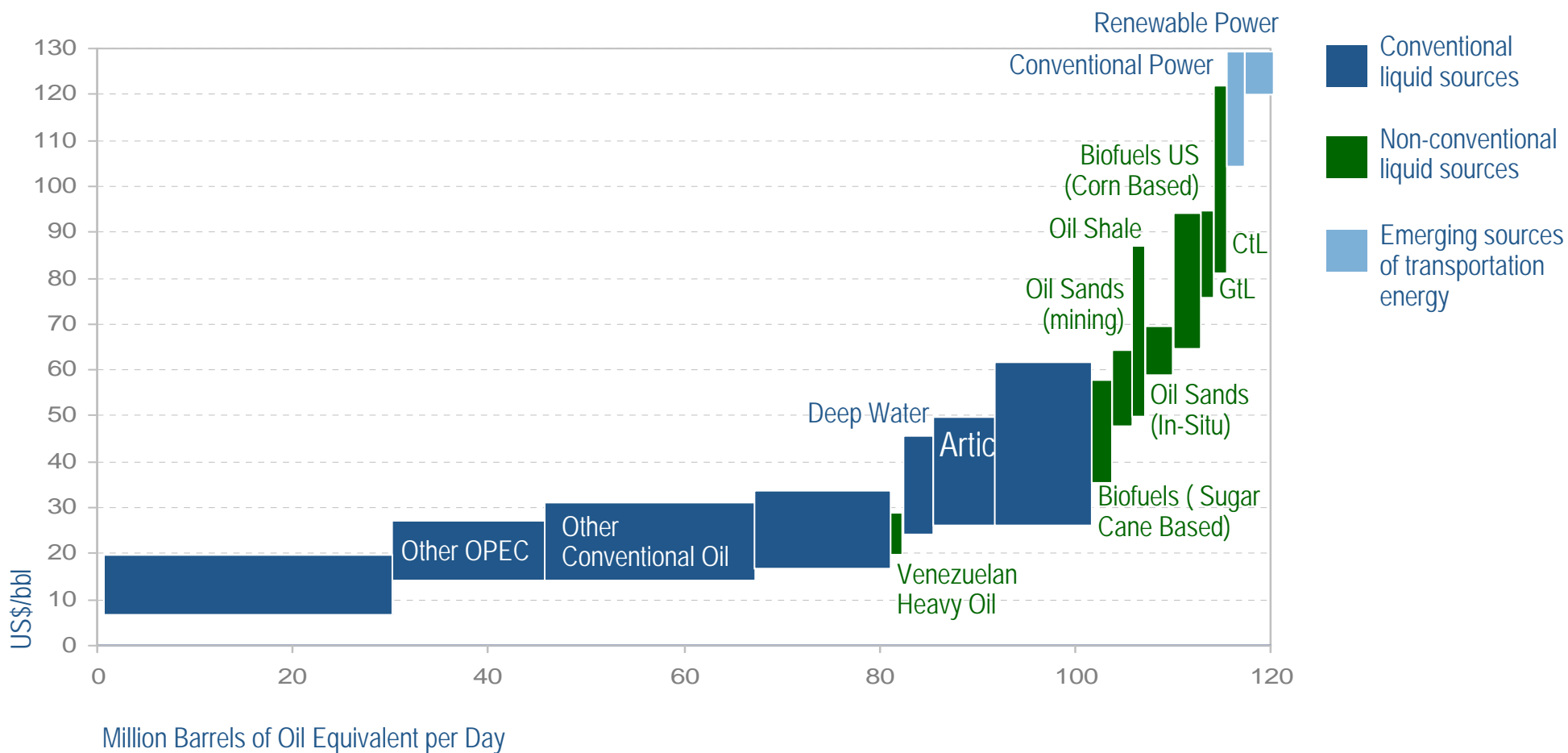


Source: U.S. DOE/EIA; LCMC Estimates.

# Shifts in the marginal cost curve for oil supply

Base marginal cost used to be \$10 to 20, unconventional oil sands push to \$90, now what?

Producing basins by marginal cost



Source: Booz Allen/IEA - Assumed average vs. marginal costs; 10% return for conventional and 13% return for unconventional technologies; no subsidies for biofuels; no carbon offset costs; after severance and production taxes

## Cost indicators always suggested double-digit oil prices

Three checks indicated through 2007-08 that deferred oil prices were overpriced

**PPI indicators, marginal costs for tar sands, and industry rules-of-thumb all pointed to lower prices**

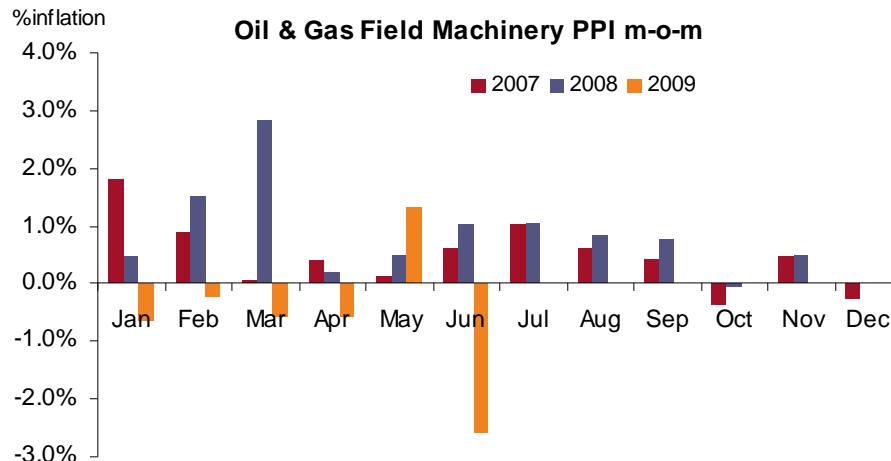
- ◆ Athabasca oil sands is a popular choice for the marginal basin: Industry sources approximated the marginal cost of the tar sands to be at most \$90 during 1H '08. Recently, the dry-up in refinery projects has put downward pressure on negotiated contract prices. Together with lower natural gas prices, the oil sands may now be economical at \$50/bbl.
- ◆ A survey of the top 50 US upstream oil companies found average Finding and Development (F&D) costs have averaged \$17.46 over the past three years. Using the industry rule-of-thumb positing a 3 or 4-to-1 ratio between F&D costs and market strip prices, this implied prices must be around \$70/bbl as of end 2007. Cost inflation might understate these costs, although the costs are now coming down. Average operating costs are close to \$10/bbl.
- ◆ Using the past historical statistical relationship, US Bureau of Labor Statistics Producer Price Indices (PPI) for oil-specific production costs, such as machinery, drilling costs, and wages, indicate deferred prices should be around \$65-70/bbl.

# Significant cost deflation seen in oil/gas upstream projects

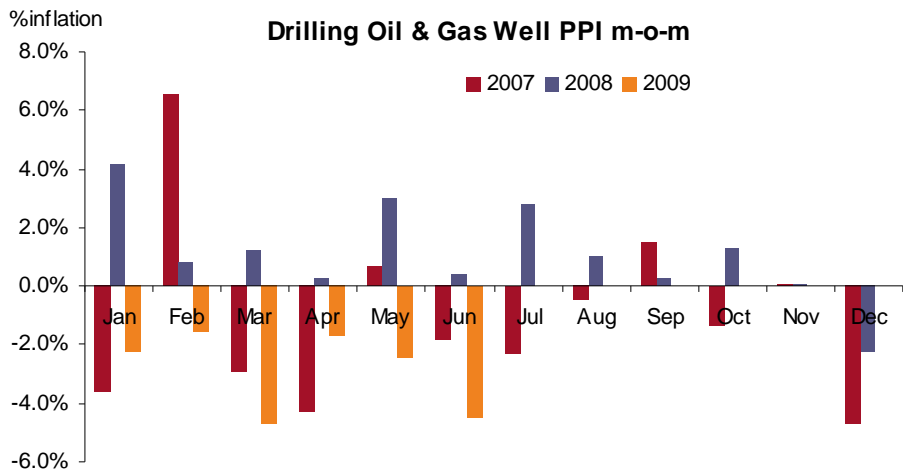
Data on the cost of production see the strongest rate of deflation in decades

- ◆ PPI Indicators for the oil and gas sector tracked by the US Bureau of Labor Statistics sees significant declines in the costs of production, both in machinery costs and drilling well costs.
- ◆ In particular, the typically sticky support activities indicator, which tracks contractor wages, has seen a near -6% decline in April, by far the strongest move in either direction since tracking started in 1994.

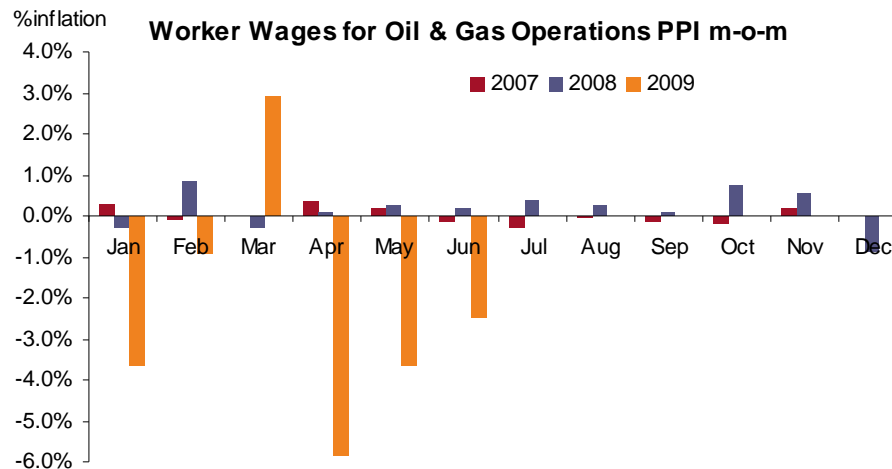
## Machinery PPI m-o-m % changes



## Drilling Well PPI m-o-m % changes



## Wage PPI m-o-m % changes

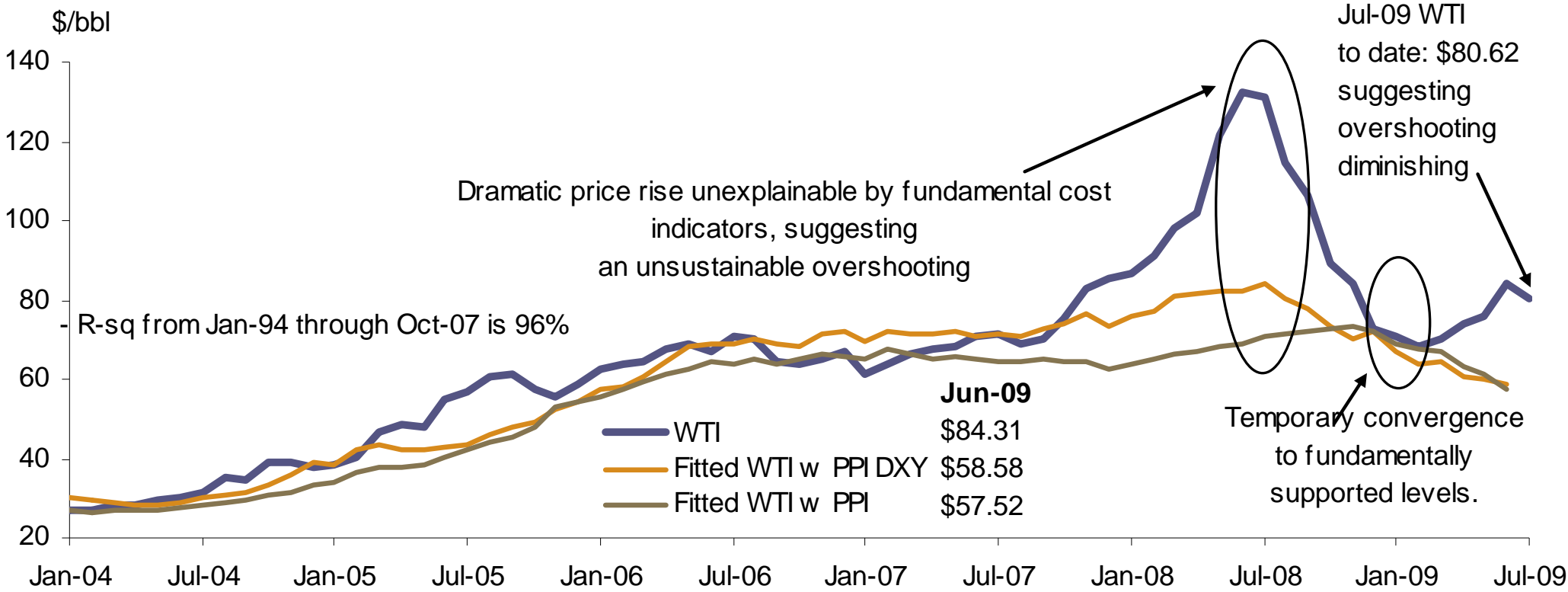


# Fundamental cost indices and long-term nominal oil prices

Cost deflation suggest flat to weakening long-term equilibrium prices

- ◆ WTI prices far overshoot fundamentally sustainable levels in 2007 and into 2008, but market prices have converged back to explainable levels
- ◆ We expect continued deflation in cost indicators, as the market for oil machinery and wages cyclically downshifts and infrastructure bottlenecks ease
- ◆ Even with a 10% depreciation in the US dollar, we expect a fair price for long-dated WTI should equilibrate to around \$50-60/bbl by 4Q 2009

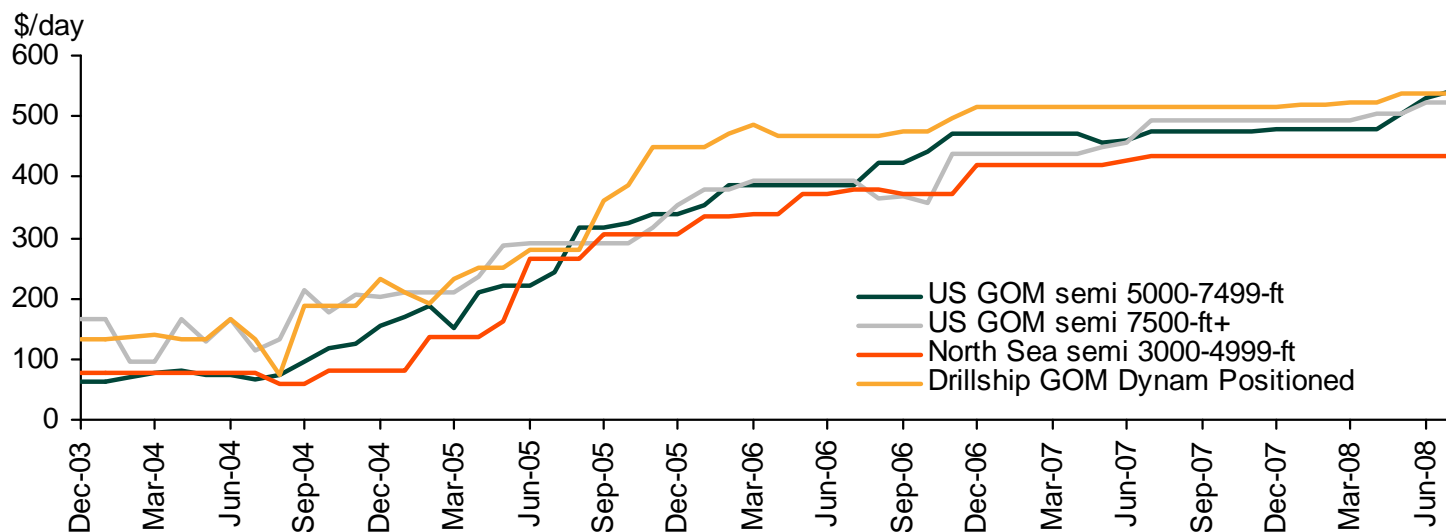
**Average monthly 60-m forward WTI prices and fitted PPI cost indicators**



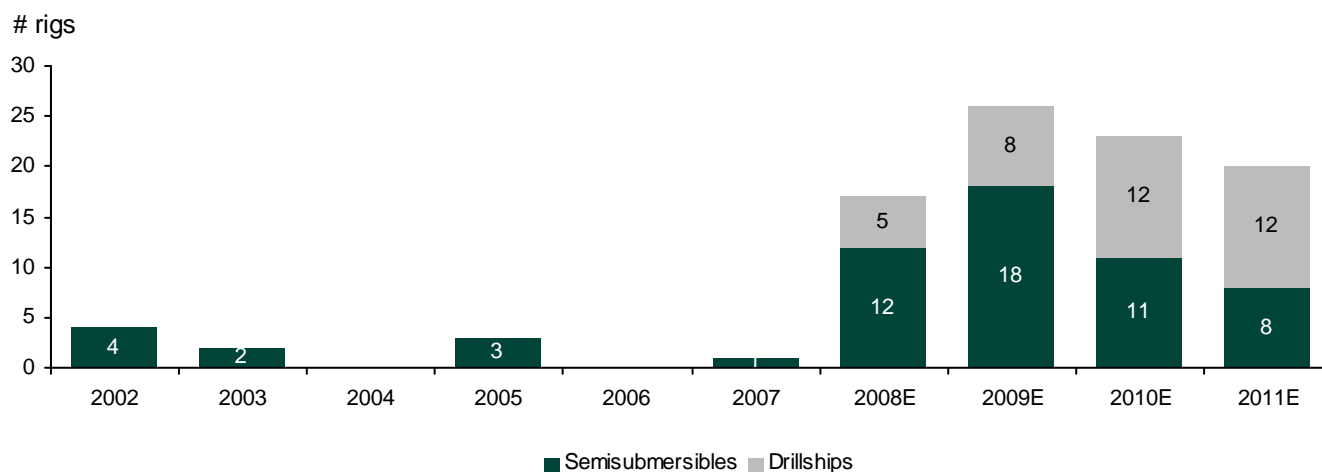
Source: Bloomberg, US BLS, LCM Research.

# Deepwater costs for the marginal offshore basins

Deepwater Rig Day-Rates show inflation from 2004-06 but flatten since



Looking ahead, the market for deepwater rigs will loosen due to new supply



Source: ODS-Petrodata and LCMC Estimates

## Supply takeaways

In the near-term, sufficient supply exists but longer-term questions remain

- ◆ The coincidence of new production capacity builds finally coming online and a downturn in demand has opened significant spare capacity at least 7mbd
- ◆ This will well supply the market under any realistic demand trajectory for the next 2-3 years
- ◆ Furthermore, there is strong geopolitical impetus for Saudi Arabia, the major holder of swing production, to keep prices below \$75/bbl
- ◆ Concern over the rate of depletion in non-OPEC sources of supply is an artifact of 20 years of low investment, accelerating the decline of mature basins
- ◆ However, companies may postpone projects until cost deflation subsidies
- ◆ Non-OPEC production will likely stagnate (with increases in Russia, US, elsewhere offsetting declines in North Sea and Mexico), until deepwater sources are tapped, which is unlikely until 2011
- ◆ Questions remain over the longer-term trajectory of supply, with demand possibly squeezing capacity before new deepwater and other fields are developed by a 2010-12 time frame

## Macro factors and financial flows

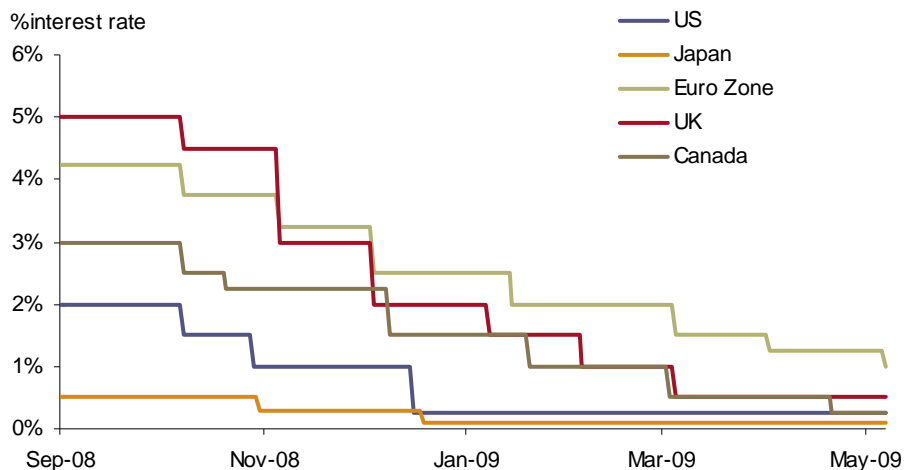
QE driving inflation fears, while return of risk appetite weakens US dollar demand

# The march of the plumbers

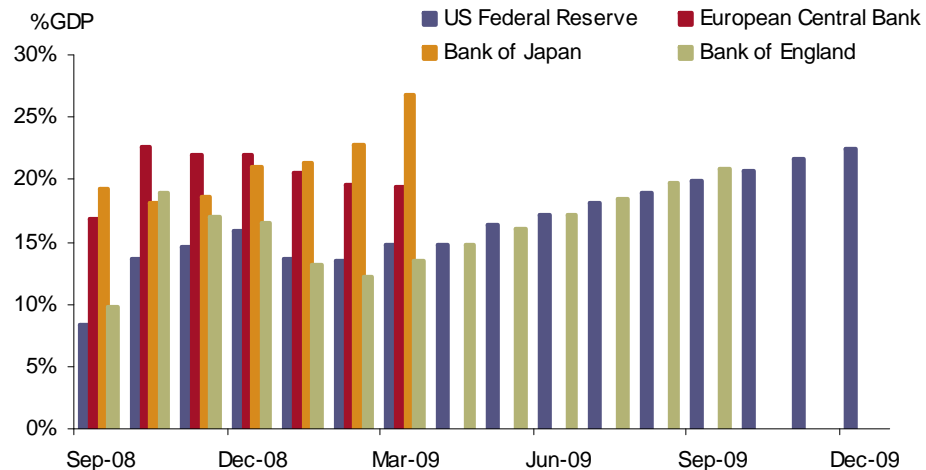
Central bankers have unleashed unconventional QE to jumpstart a recovery

- ◆ Facing a frozen credit market and the threat of a deflationary spiral, central banks have drastically loosened monetary policy.
  - The US Federal Reserve, the Bank of Japan, and the Bank of Canada have set interest rate targets effectively at zero.
  - The Bank of England and the European Central Bank have reserved some conventional ammunition, but the BoE's target is at a relatively low 0.5% while the ECB has announced another 25bp cut to 1% on May 7.
- ◆ Central banks are also stepping up unconventional “quantitative easing” efforts by expanding balance sheets with asset purchases.
  - The Fed has stood out in its unconventional boldness. In particular, on March 18, 2009, the FOMC announced plans to purchase another \$1.25tn in long-term Treasury bonds, mortgage-backed securities, and Fannie Mae/Freddie Mac debt, pushing their balance sheet from 8.4% to over 22% of GDP.
  - The BoE has also acted aggressively, adding another £50bn to the previous £75bn in purchases on May 7.
  - Even ECB President Trichet, who had dragged his feet on QE, has recently announced a plan to purchase €60bn in corporate bonds, though he was blasted in an extraordinary statement by German Chancellor Angela Merkel

**Central Bank Targets, Sep-08 to present**



**CB Balance Sheets % of GDP, projections from Apr-09**



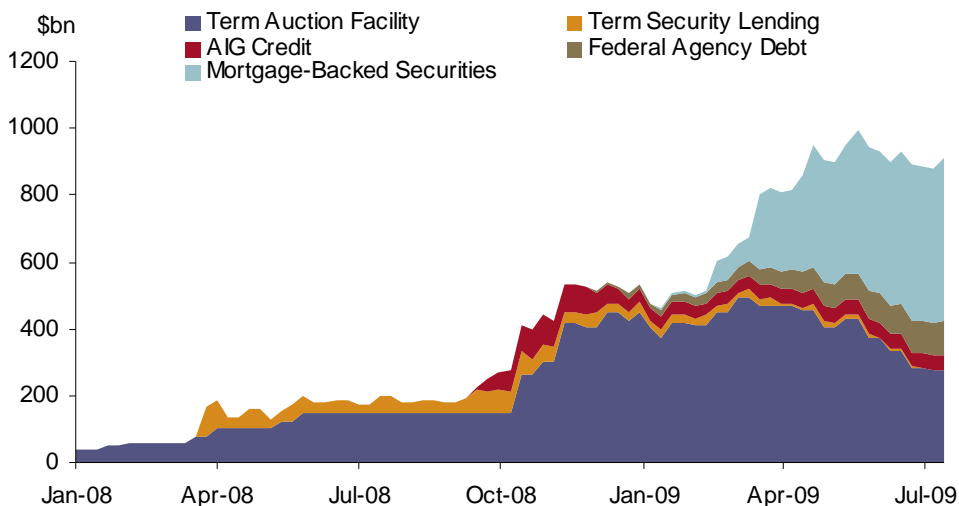
Source: Bloomberg, Federal Reserve, BoE, BoJ, ECB, LCM Research.

# Liquidity hoarding stymieing “trickle down” credit

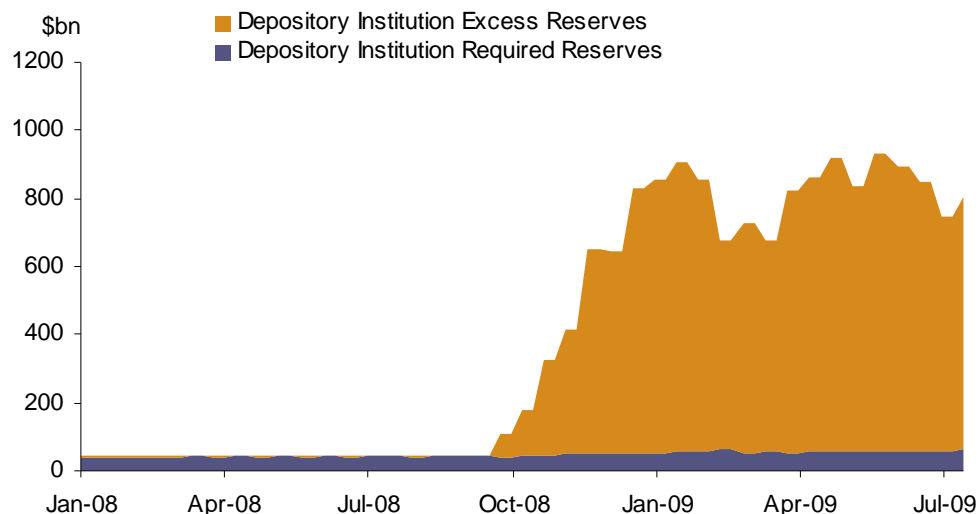
Commercial banks have increased excess reserves comparable to QE injections

- ◆ Part of the reason behind the Fed’s limited success in bringing private sector interest rates down may be traced to the risk-averse behavior of commercial banks
  - Since the beginning of 2008, the Fed has expanded its balance sheet with roughly \$1tn in toxic assets from commercial banks and other major financial institutions
  - However, at the same time, the excess reserves, i.e. the balance they hold at the Fed above their required minimum, has increased from nothing to about \$900bn!
- ◆ Frustratingly for policymakers, private institutions are hoarding the excess liquidity rather than lending and re-circulating the liquidity into the general economy.
- ◆ But in an ironic twist, this may make the much-vaunted “exit strategy” from QE easier, with controlled unwinding done through reverse-repos and differential interest rates on deposits

**Fed QE asset purchases, Jan-08 to present**



**Depository Holdings at Fed, Jan-08 to present**



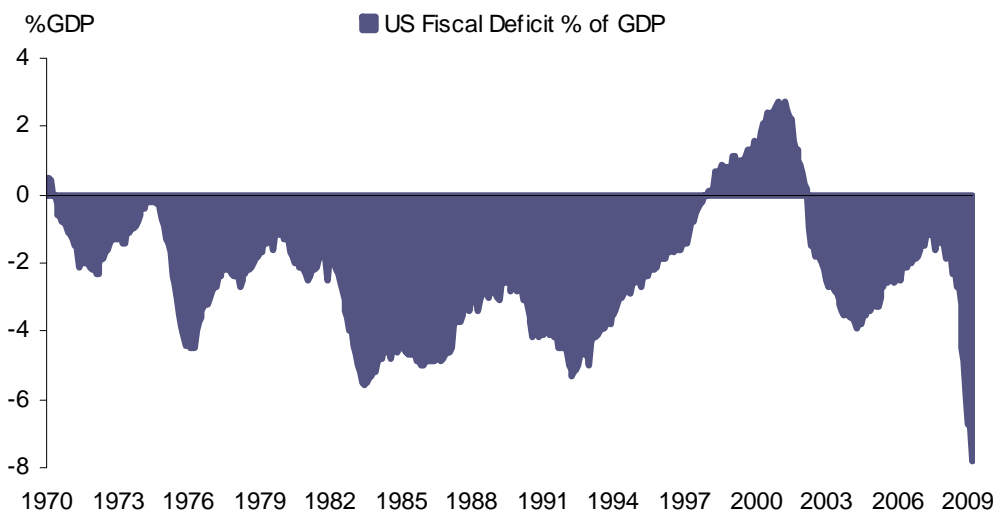
Source: Bloomberg, LCM Research.

## Whither inflation?

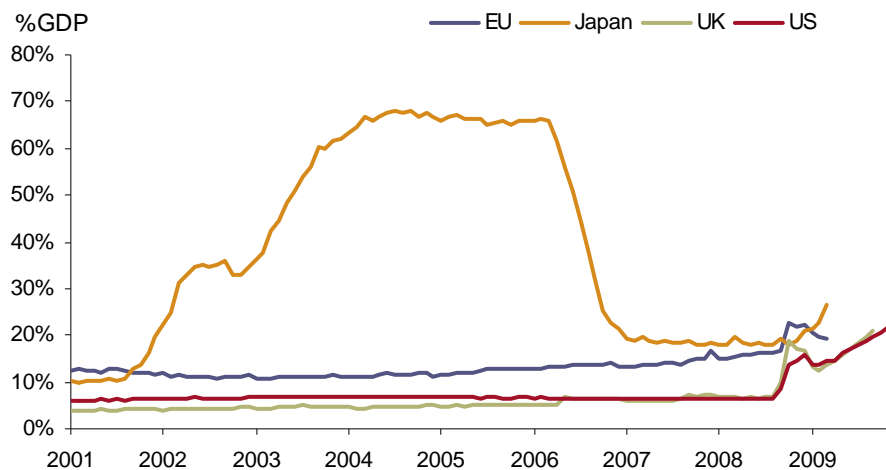
Combination of QE and fiscal deficits has stirred fears of high inflation

- ◆ One side consequence of the US “kitchen sink” approach to monetary QE and fiscal stimuli has been to stir fears of high medium-term inflation.
- ◆ The combination of massive US government borrowing to pay for the fiscal stimulus package and the concurrent large expansion of money supply raised dark whispers of “printing money,” akin to the hyperinflationary episodes in Germany and Austria during the interwar period.
- ◆ But the experience of the Japanese “lost decade” shows how massive QE can coexist with a continued deflation without an effective turnaround.

**US Government Deficit as % of GDP**



**Central Bank Balance Sheets as % of GDP**

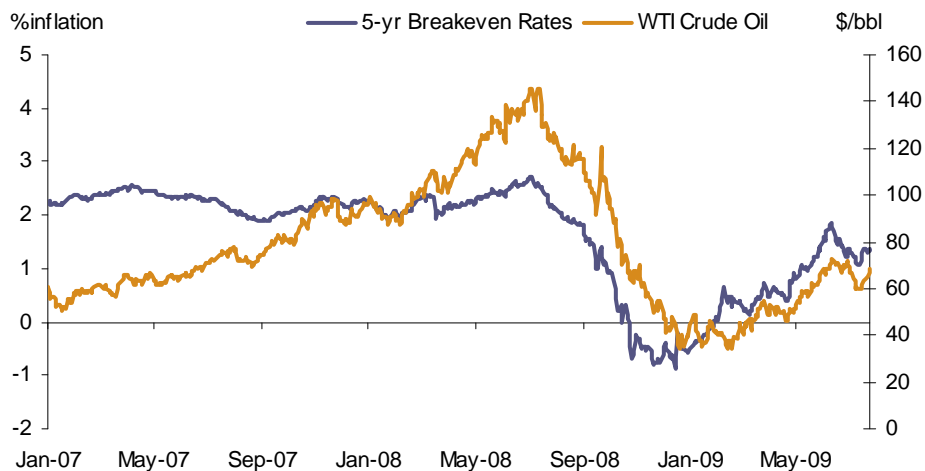


# Commodities seem to be pricing in high levels of inflation

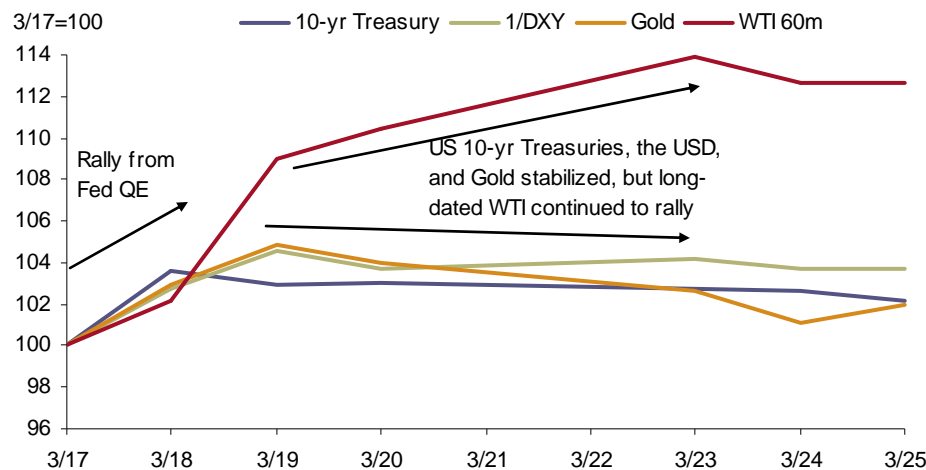
Financial investment into commodities have returned in force

- ◆ Oil markets have shown surprising price resilience despite weak fundamental data.
  - The response in oil markets to the FOMC QE announcement in March 17, 2009 was all out-of-proportion to responses in other assets such as US 10-year Treasuries, Gold, the US Dollar
- ◆ Fears of inflation can drive financial diversification into real assets such as gold, oil, and other commodities, potentially stimulating headline inflation and self-fulfilling the prophecy.
  - Annualized outlays on crude oil have already reached roughly \$500bn for the US, and \$2tn for world.
- ◆ Nominal inflation-driven instead of fundamental-driven commodity price spikes raise the specter of 1970s-style stagflation, prolonging economic pain.

**Breakeven rates and crude oil prices**



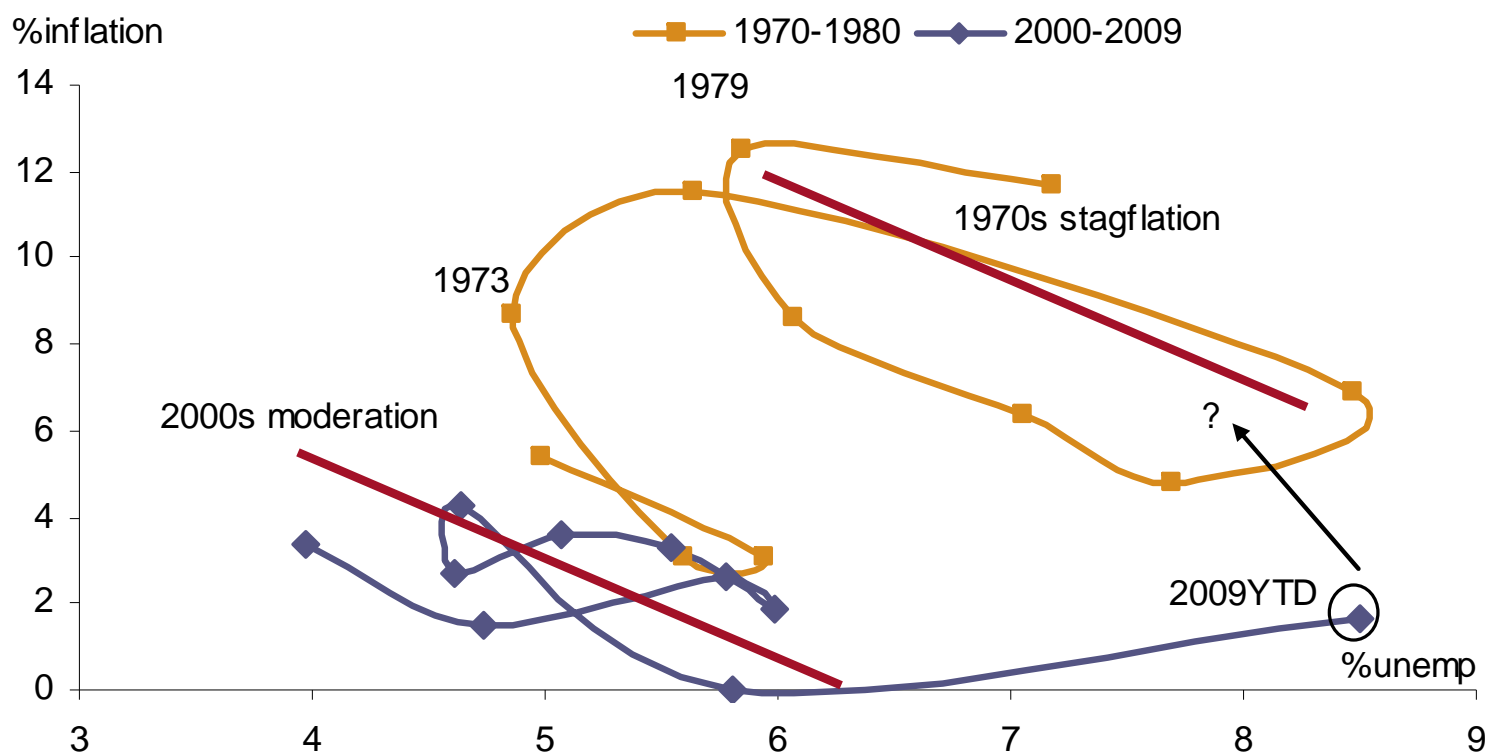
**Market reactions to 3/17 announcement**



## Phillips in Peril?

- ◆ Ironically, the “green shoots” of optimism that the Federal Reserve and other policymakers have strived so hard to reinforce to prevent a deflationary spiral may potentially backfire.
- ◆ The dislocation between the real slack in the economy and optimism over a sharp V-shaped recovery and accompanying expectations of higher nominal inflation has opened up the possibility of a shift outward in the Phillips Curve.
- ◆ Maintaining central bank independence and maneuvering room against any inflationary unhinging will be critical to preventing another 1970s-style stagflationary episode.

Phillips Curve in the 1970s and 2000s



## For a Rainy Day

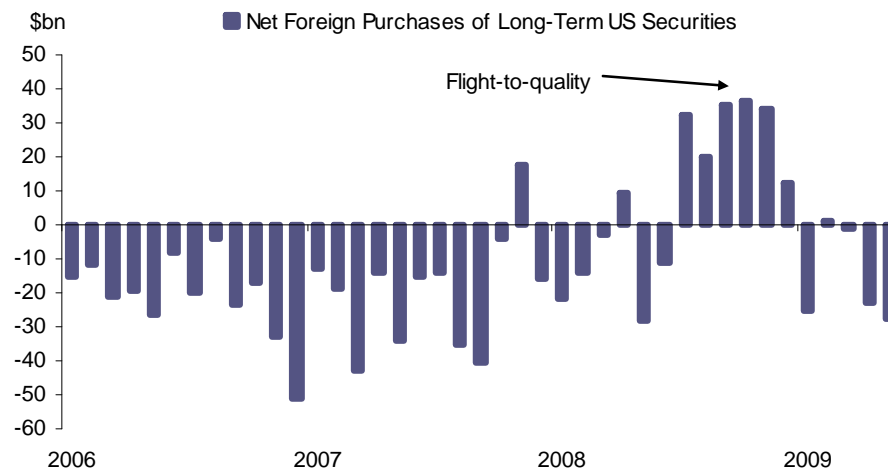
The dollar had been artificially strengthened through flight-to-quality

- ◆ Despite concerns over the sustainability of US fiscal and current account deficits, the verdict of international investors has been a ringing confirmation of the superiority of dollar-denominated assets, particularly US Treasuries, as a safe haven when the world turns ugly.
- ◆ Net purchases by foreigners of US long-term securities surged amid the credit crisis, peaking at \$36.5bn in October of last year.
- ◆ However, the capital flows have begun a reversal that may accelerate as the global economy mends and return-starved investors start seeking performance, particularly in stronger emerging economies.
- ◆ The dollar would have to depreciate by another 10% against a trade-weighted basket to reach levels immediately prior to the intensification of the credit crunch.

### US Trade-weighted dollar



### Net foreign purchases of long-term US securities

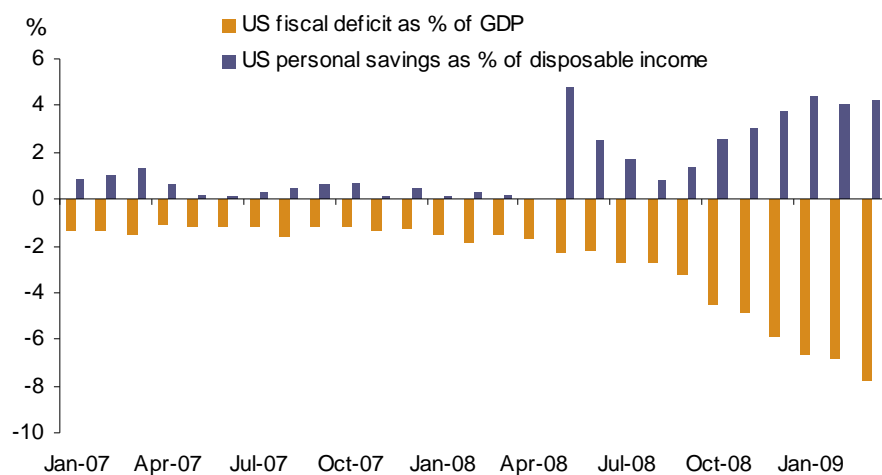


## Reservations over the reserve currency

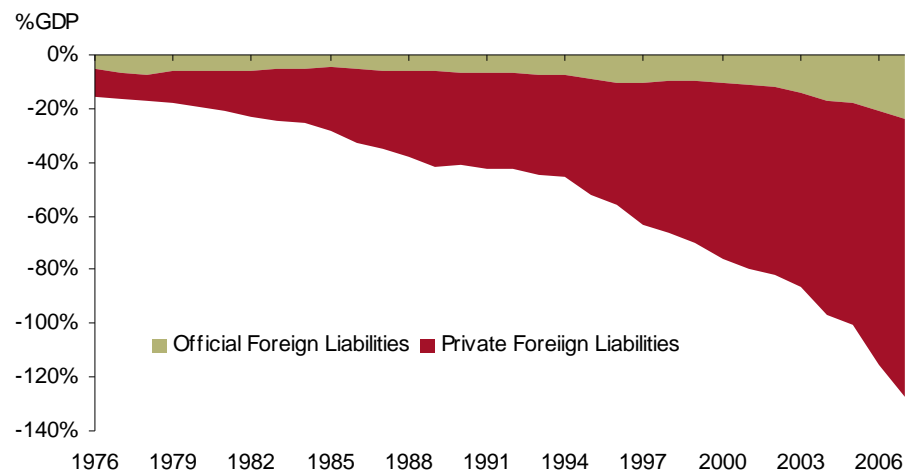
The US is substituting private borrowing with public borrowing

- ◆ Even as US personal savings rose to historic highs as consumers cut back on spending, the US government has expanded its spending, thus substituting private for public borrowing.
- ◆ To pay for this fiscal spending despite falling tax revenues, the US Treasury must massively expand their liabilities through borrowing. Purchases from China, the GCC, and other investors, despite artificially unattractive yields, will be critical to maintain the fiscal soundness of the US economy.
- ◆ US foreign liabilities have increased to 127% of GDP as of 2007 and will likely accelerate higher. Meanwhile, US assets abroad have also reached about 100% of GDP.
- ◆ Typically, these liabilities should be reduced through a succession of current account surpluses, with the value of net exports reducing the outstanding net liabilities.

### US Private and Public Savings Rates



### Private and Official Foreign Liabilities as % of GDP

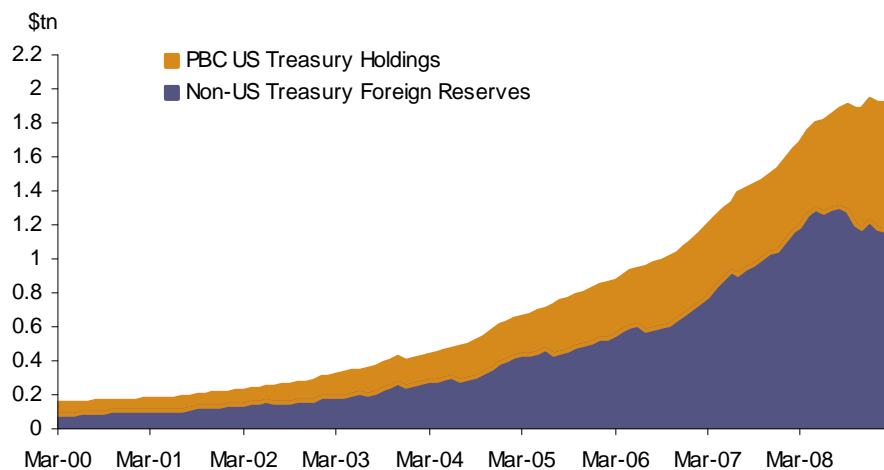


# Exorbitant privileges of currency adjustment

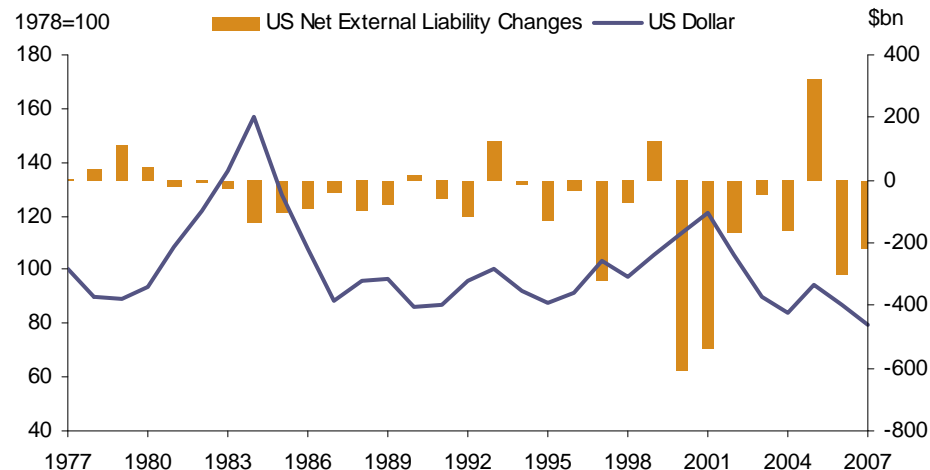
Weakness in the USD may deflate away external liabilities

- ◆ The US also benefits from “exorbitant privilege” in subtler ways than d’Estaing noted
  - Nearly all US foreign liabilities are USD denominated, while perhaps 70% of US assets abroad are in local currency.
  - A rough rule of thumb would suggest a 10% depreciation in the dollar would, ceteris paribus, transfer about 7% of GDP (in US \$) onto the US international balance sheet. By comparison, the US current account deficit was “only” 4.7% of GDP in 4Q08.
- ◆ Gourinchas and Rey (2007) estimate that nearly 27% of the US external adjustment was absorbed by the excess returns US investors gained relative to foreign investors, much due to dollar depreciation.
- ◆ We believe this international portfolio adjustment mechanism, rather than pure nominal inflation, may be the key mechanism to release pressures of US fiscal and monetary expansion

**PBC US Treasury and Non-Treasury Reserves**



**US Net External Liabilities y-o-y Changes and Dollar**



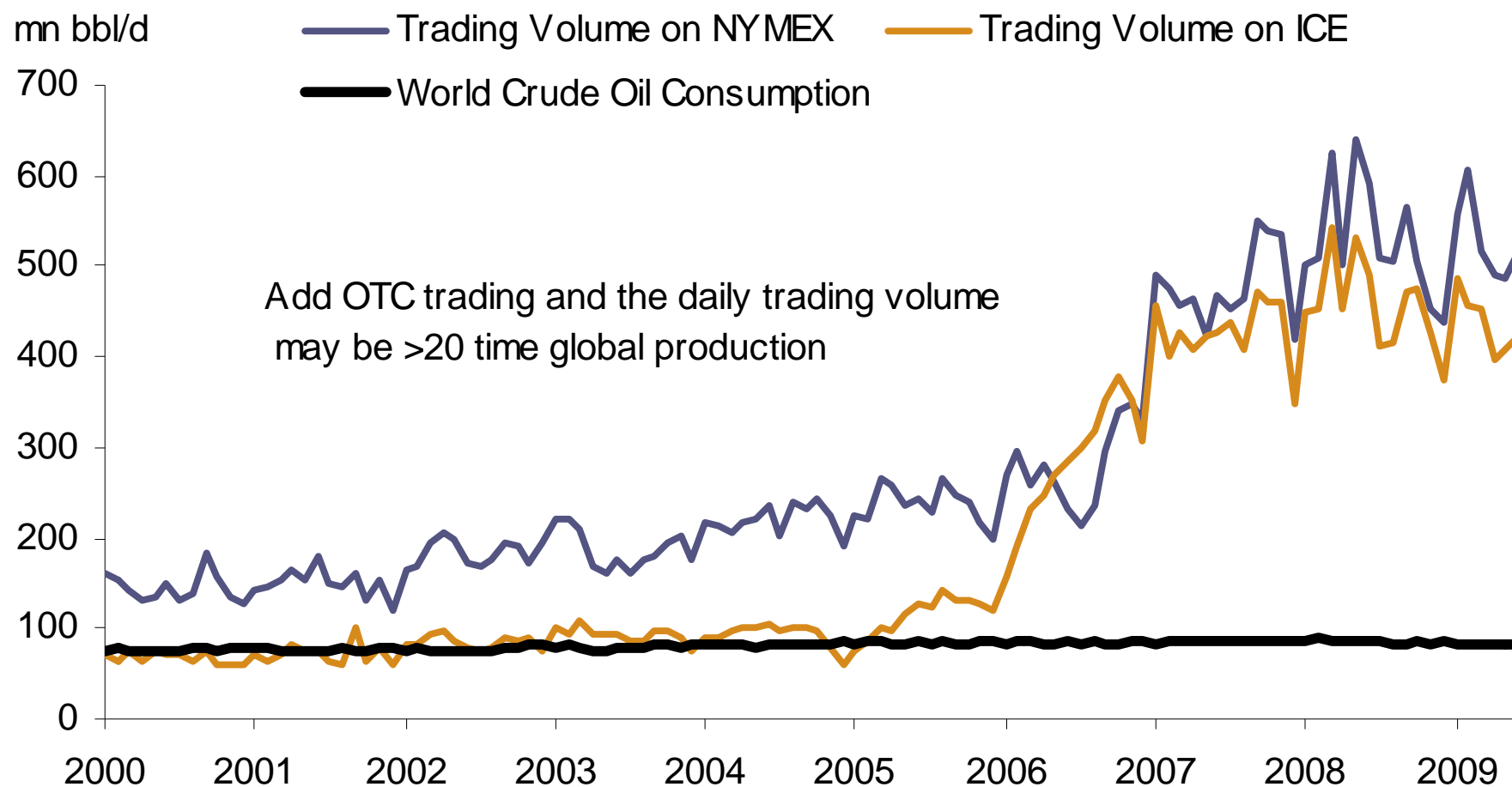
# Financial Flows

Inflation, dollar movements, portfolio diversification  
driving financial flows

## The “Financialization” of Crude Oil Markets

Daily trading volume on NYMEX crudes is over 6 times total global consumption;  
 Trading volume on ICE crudes is over 5 times total global consumption.

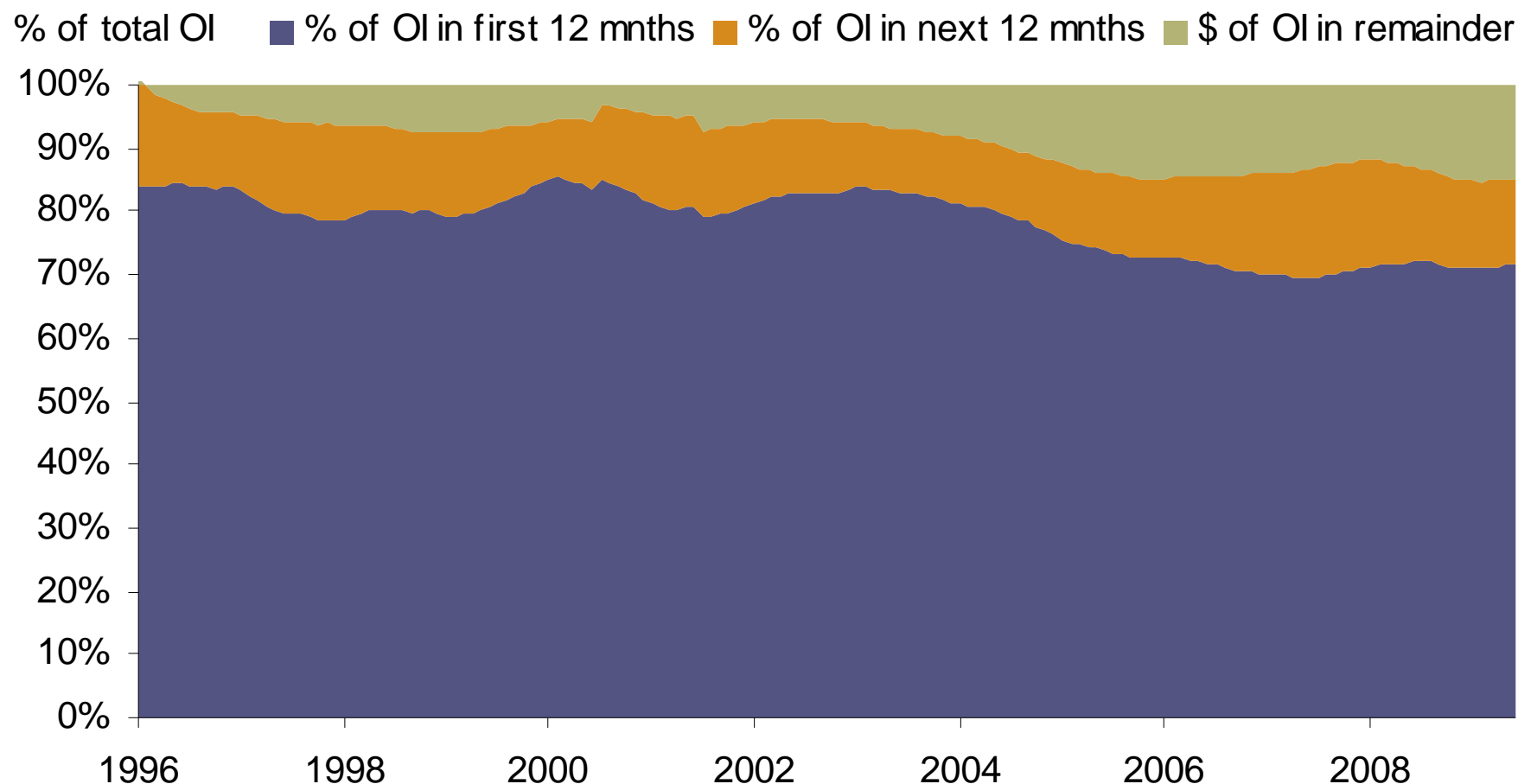
### Daily Trading Volume in WTI and Brent Crude Oil on NYMEX and ICE vs. World Oil Consumption



## The Illiquidity of Long-Term Futures Markets

However, much of the liquidity of these markets are concentrated in the front, hampering effective risk management and energy security

### Breakdown of NYMEX WTI futures open interest by horizon



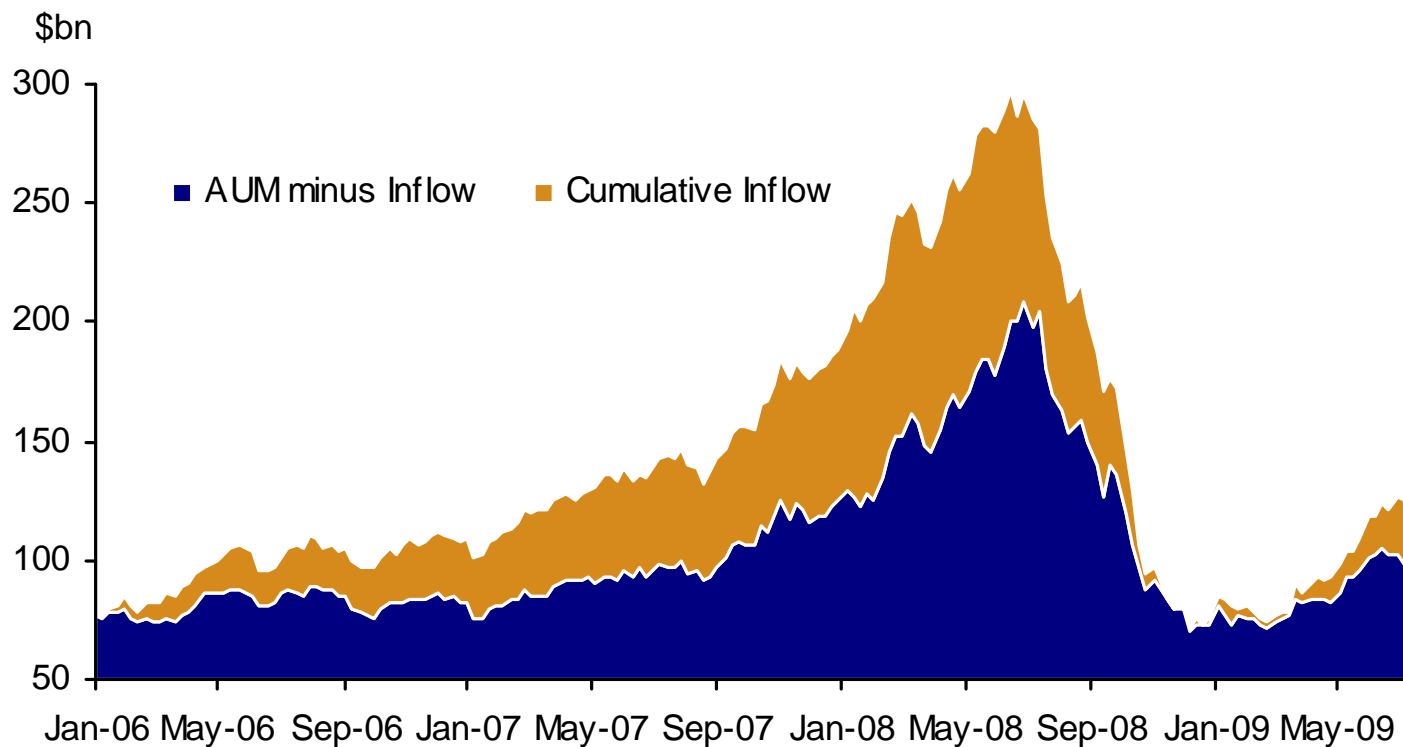
## The elephants of the pits: passive index investors

Index investment, at its peak, accounted for 25% of all long interest in WTI paper

### AUM and long-biased flow in WTI

- ◆ Passive commodity indices, providing beta exposure to large institutional investors such as university endowments and pension funds, grew rapidly since 2006. From around \$75bn in Jan-06, they peaked near \$296bn in Jul-08, before plummeting. Recently, they have grown again to approach \$111bn.
- ◆ After large liquidations from July to January of 2008, we are seeing financial investment flow in oil and other commodities strengthen again, but through a more diverse variety of investment vehicles.

### History of AUM and cumulative inflows into all DJ-AIG commodities



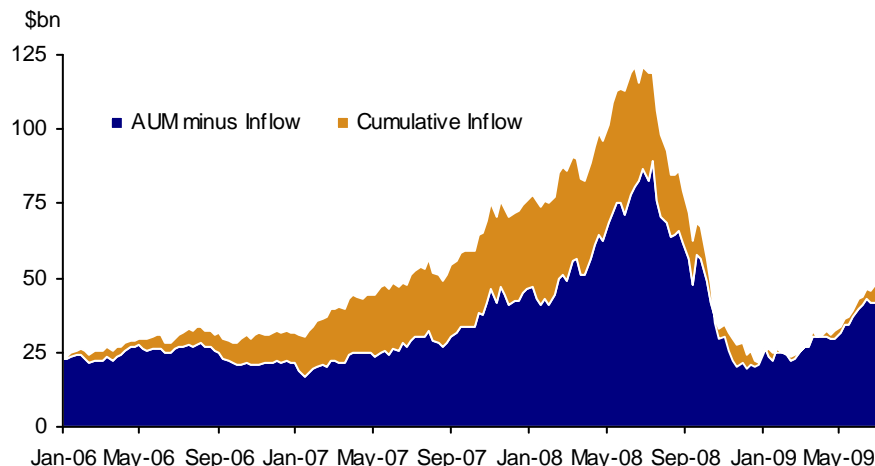
Source: Bloomberg, CFTC, GSCI, DJ-AIG, LCM Research.

# Shift in investment from passive indices to ETFs

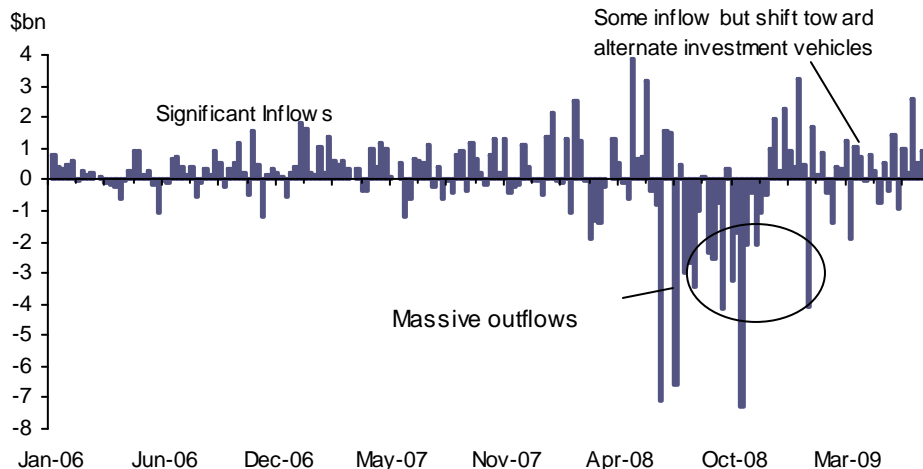
Data on the cost of production see the strongest rate of deflation in decades

- ◆ For WTI crude oil, we estimate cumulative index inflow of \$33bn into a total WTI AUM of about \$93bn in Jun-08. To put in perspective, the entire market capitalization of all WTI open interest on the NYMEX exchange is about \$380bn. Hence, index investment accounted for about a quarter of all long interest in paper oil.
- ◆ Recently, index investment into the crudes are returning, but the major growth story is oil and gas-related ETFs, such as USO and UNG, which grew even as index AUM fell.

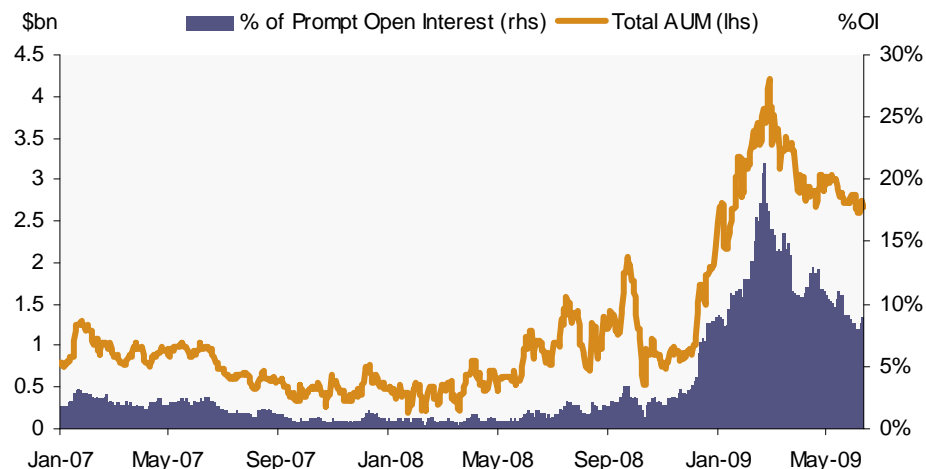
**Index AUM in WTI and Brent**



**Net Index Inflows into WTI and Brent**



**The Rise and Fall of Oil ETFs**

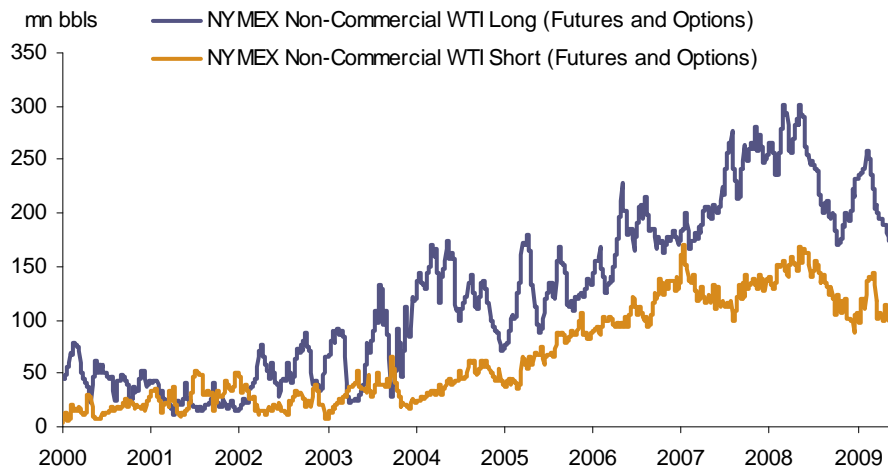


# Increasing speculator long interest in crude oil

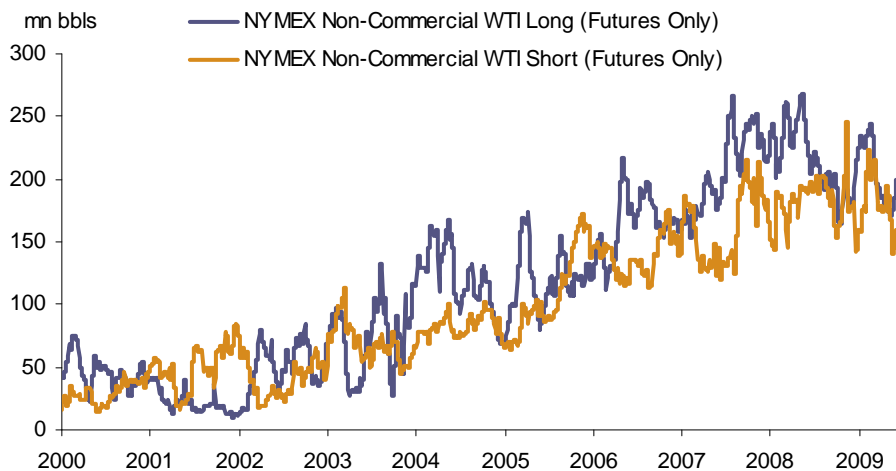
Long vs. short positions for non-commercials signal a recent shift

- ◆ Recent data from the CFTC on the long and short positions of non-commercial speculative investors in crude oil see a distinct increase in the long vs. short balance in both futures only and futures and options combined numbers.
- ◆ Optimism over the green shoots of fundamental demand for oil and fears of the nominal inflation backlash from global QE efforts is driving many macro hedge funds into crude oil exposure.

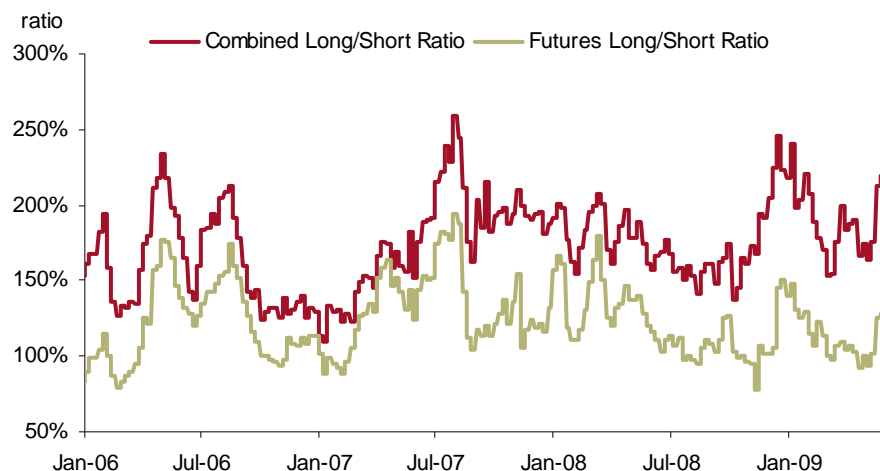
**NYMEX WTI Non-Com Combined Long/Short**



**NYMEX WTI Non-Com Futures Long/Short**



**Non-Commercial Long/Short Ratios**

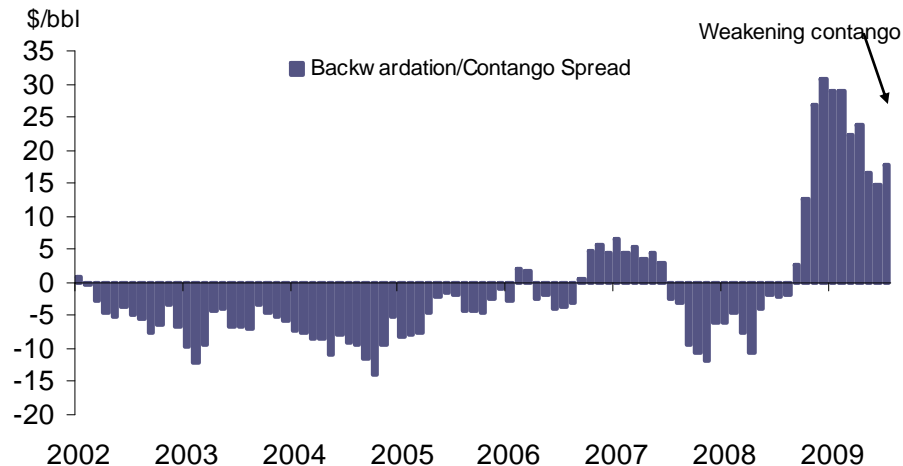


# Whither oil prices?

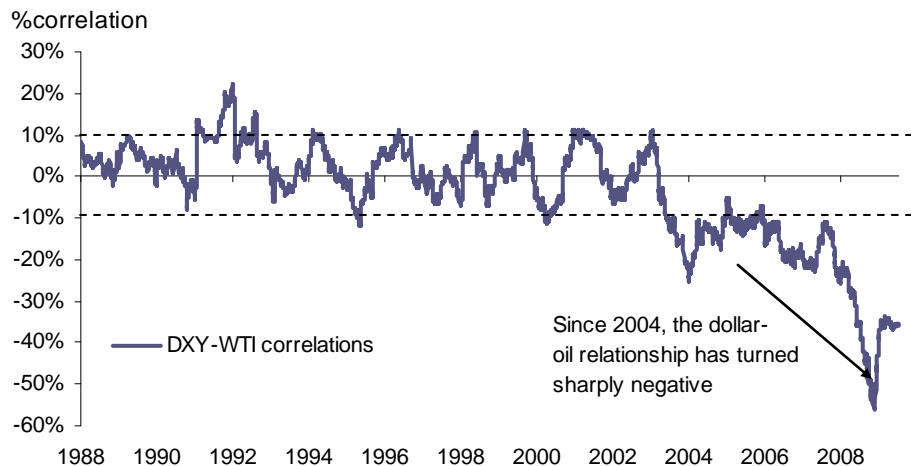
The long-term trend for oil is firmly downward, but nominal bounce risks

- ◆ Demand and supply fundamentals and the inventory glut point toward compellingly sideways-moving prices capped at \$75/bbl for next three years.
- ◆ However, oil and other commodities have recently been unusually sensitive to movements in dollar and inflation expectations due to financial flows.
- ◆ We may see a continued rally in the front to \$75/bbl, narrowing the contango further, before the entire curve shifts downward

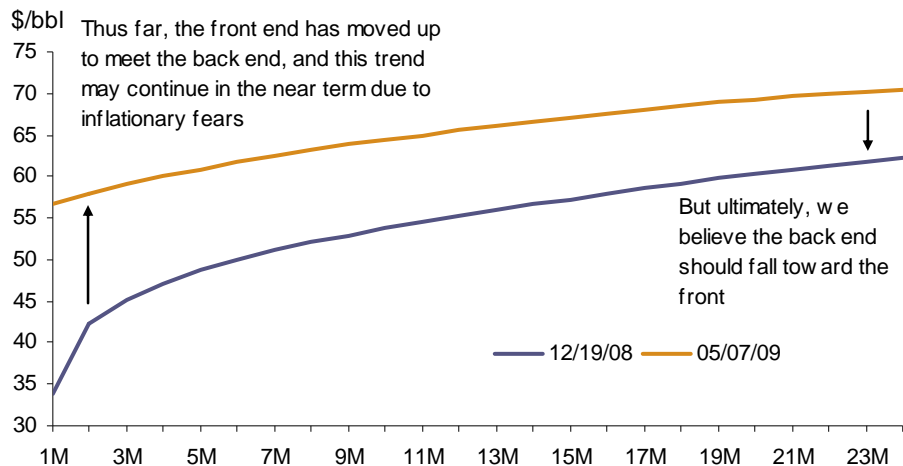
**CL1/CL60 backwardation/contango spreads**



**Historical WTI/DXY Correlations**



**WTI Forward Curves 12/19/08 and 05/07/09**



## New Regulation Initiatives

Regulation initiatives are under way in broad sections of government

- ◆ Two phenomena in financial markets have focused Washington's attention on derivative market reform:
  - The subprime mortgage credit crisis, and the role played by credit default swaps and mortgage backed securities
  - The commodity “quasi-bubble” and the potential impact of “speculators” on energy and food prices
- ◆ Momentum for action are moving in three branches of government:
  - Congress, where hearings are being held in various committees
  - The Executive Branch, with proposals for regulatory initiatives
  - The Securities and Exchange Commission (SEC), and the Commodity Futures and Trading Commission (CFTC)
- ◆ The main themes of the regulation initiatives are:
  - Refining the classification market participants, which are currently divided into commercial and non-commercial activities
    - Disaggregating bona fide hedgers, liquidity providers, and speculators
    - On the commercial side, identifying legitimate hedging from speculation (e.g. Vitol)
    - Within banks, identifying when they are providing swap services to index funds vs. own proprietary trading
  - Deciding the proper context of new instruments such as index funds and ETFs, which are arguably passive “bona fide” investments by long-term or retail investors
    - Difficulty arises because both index investors and ETF investors seek to take a long-term view of commodities but express it in short-term prompt month instruments, contributing to volatility

## Likely direction of regulation

Transparency likely first, before more controversial OTC and position limits

- ◆ Increases transparency, including extending the supplementary position reports for index investors from just agricultural commodities to all commodities
- ◆ Confirming the end of the “Enron loophole”
  - Requiring foreign exchanges in which US entities participate and in which US-based commodities are traded to identify market participants in same manner as CFTC
- ◆ Moving OTC vanilla contracts to exchanges, and requiring the clearing of OTC contracts onto third-party clearing exchanges
- ◆ Extending position limits, and ending exemptions for non-bona fide hedgers
  - The CFTC has the authority to impose position limits and revoke exemptions to eliminate damages from “excessive speculation”
  - The CFTC already sets position limits for agricultural commodities per contract per exchange
  - Currently, for energy, the exchanges themselves have the responsibility for position limits
    - NYMEX: 20,000 WTI contracts, 12,000 NG contracts, 7,000 HO contracts, 7,000 gasoline contracts
    - ICE has no position limits

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**•Certification**

The views expressed in this report accurately reflect the personal views of Daniel P. Ahn, the primary individual responsible for this report, about the subject referred to herein, and no part of such compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed herein.

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