Oil and the Macro-economy 2010

Macroeconomic Cause and Effect, and the Impact of Financial Flows

LCM RESEARCH

Daniel P. Ahn, Ph.D.

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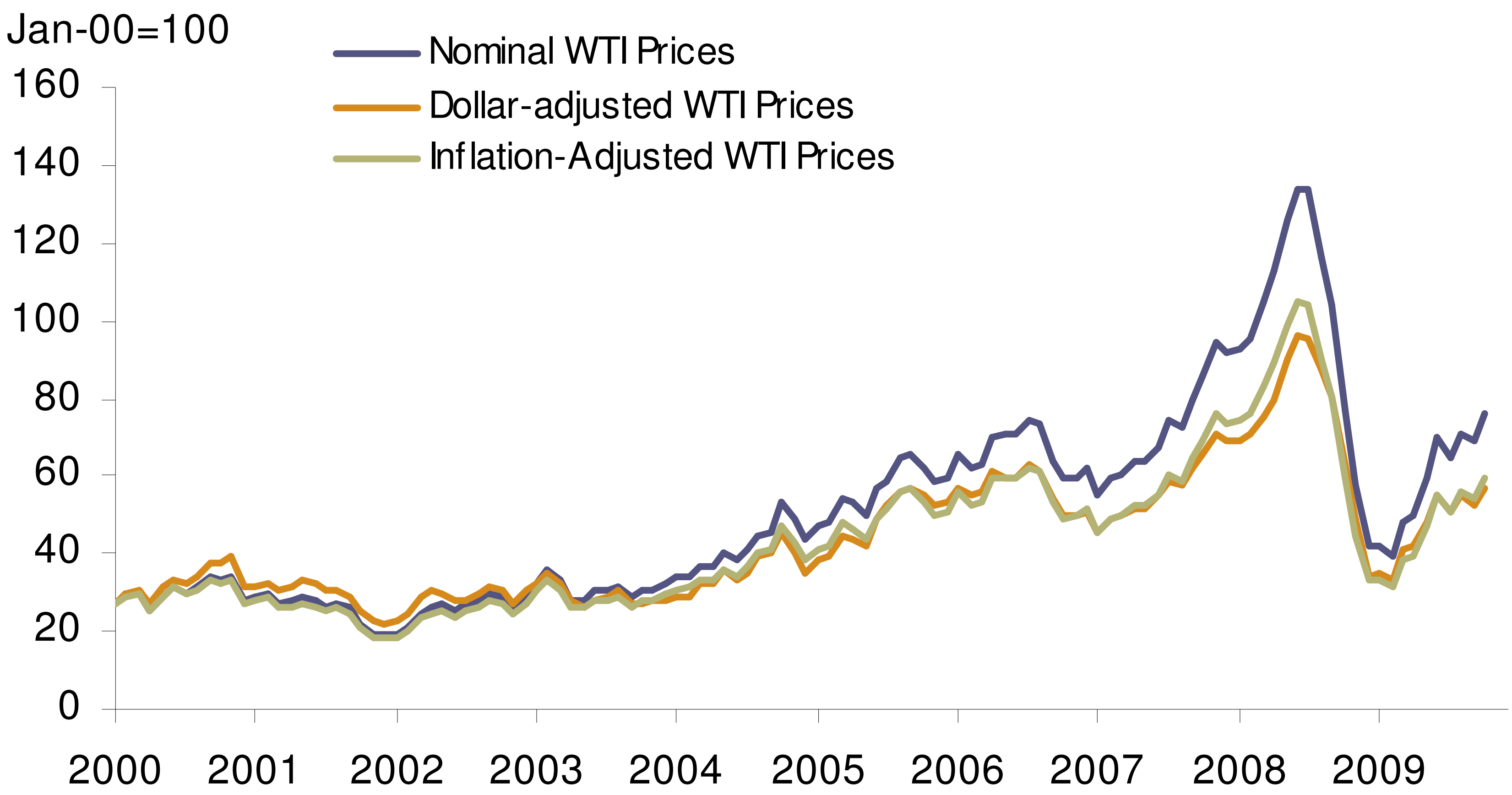
Oil and the Macro-economy

- *Demand*: Impact of downturn on US demand
- *Financial flows*: Growth of passive index investors and retail ETFs
- *QE and deficits*: Setting the macro stage for inflation expectations, dollar depreciation
- *Disentanglement*: Disentangling demand vs. supply oil shocks to determine macro impact

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)



Economic downturn and demand outlook

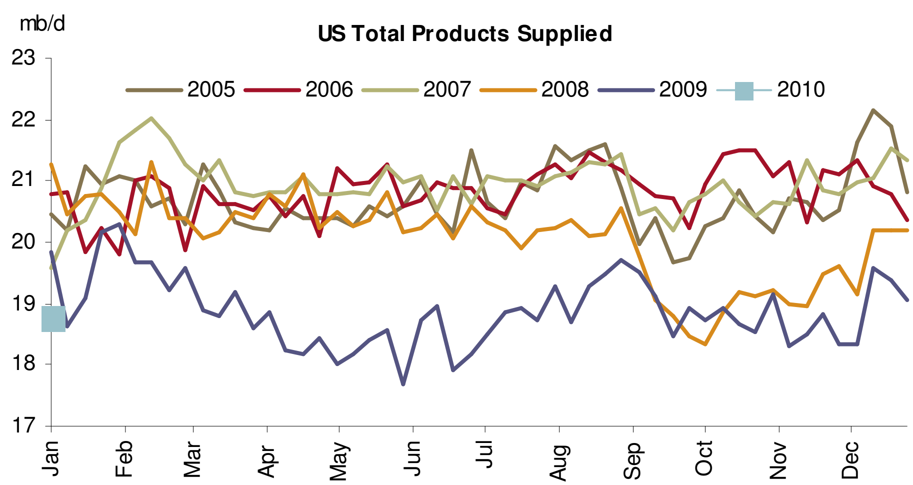
Recovery sees permanent demand destruction in gasoline but potential bounce back in distillate

Through the Looking-Glass

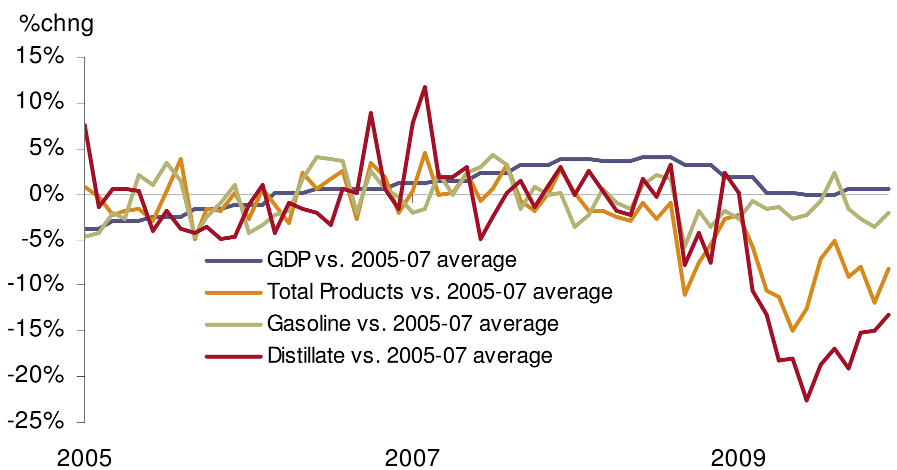
Domestic petroleum demand has continued to lag despite headline V

- Despite the headline V seen in broad macroeconomic indicators such as GDP and industrial production, petroleum products has not recovered apace.
- The roughly 2mb/d of demand destruction seen in the fall of 2008 has not been reversed, and current demand levels trail the 20+ mb/d of demand seen pre-crisis.
- The main sources of this destruction has been in gasoline and distillate demand.

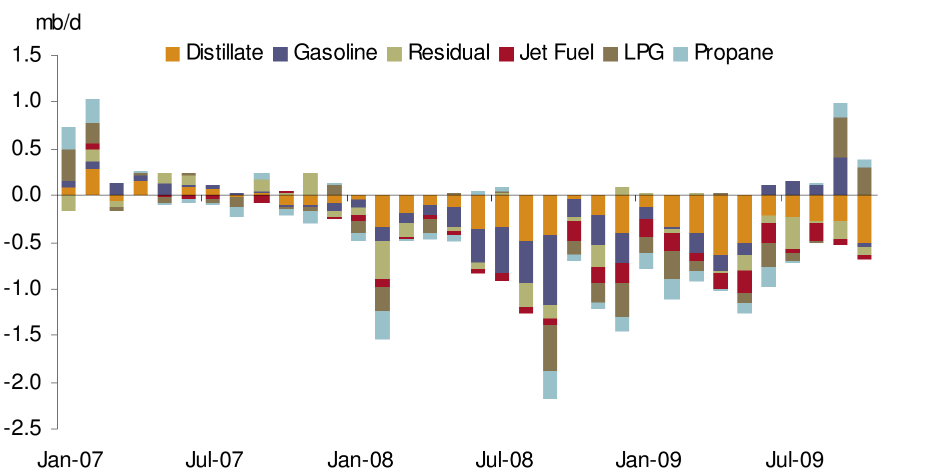
US total petroleum products supplied



GDP and petroleum demand vs. 2005-07 avg



Y-o-y demand changes by product



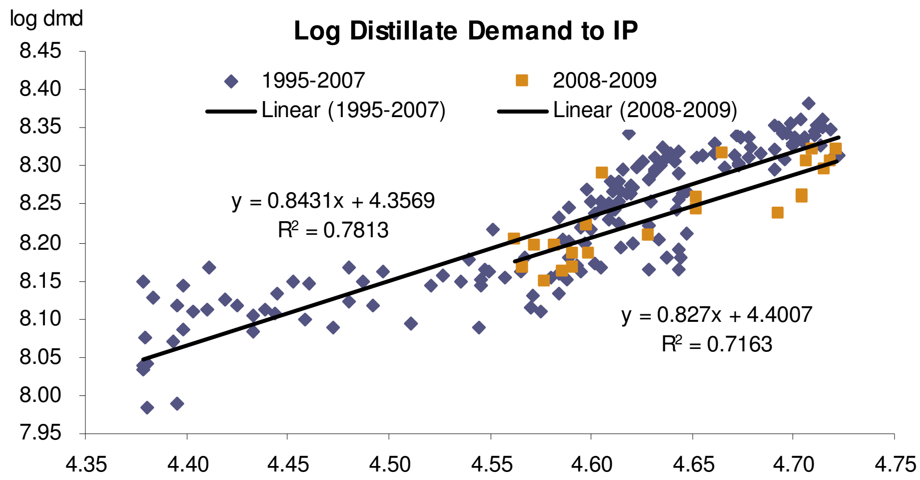
Source: Bloomberg, LCM Research.

Distilled Bounce

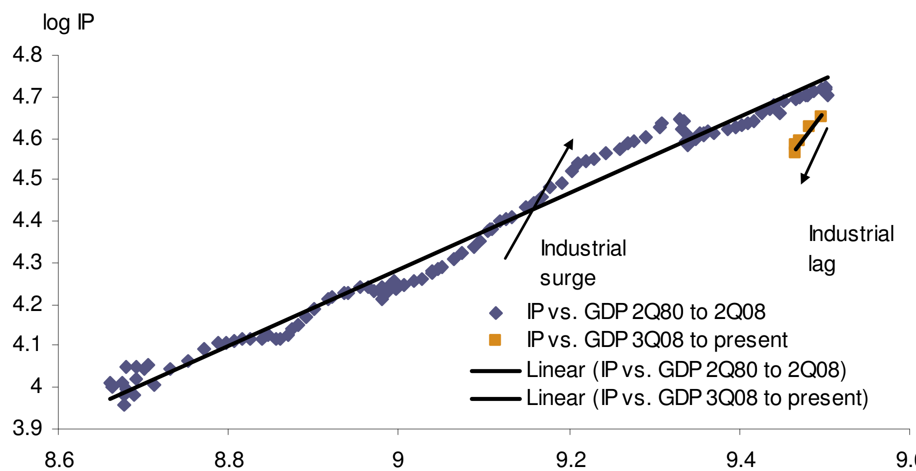
The laggard distillate may recover strongly due to returning industrial activity

- Historically, there has been a reasonably steady relationship between industrial activity and distillate demand (adjusted for seasonality), where a 10% increase in industrial production is reflected in a 8.5% increase in distillate demand.
- This relationship has largely remained stable despite the crisis and the out-of-trend fall in industrial production relative to overall GDP. With industrial production typically "overshooting" both to the downside and to the upside during a business cycle, the signs point to a continued surge in industrial activity for inventory restocking, etc. as the recovery takes root.
- This suggests that distillate demand, hitherto the laggard in the petroleum complex, may see something of a bounce back. A modest +2.5% growth in GDP for 2010 may see as high as 5-6% bounce in IP, suggesting a 4-5% (160-200kb/d) recovery in distillate demand.

Industrial production to distillate demand



Historical GDP to IP relationship



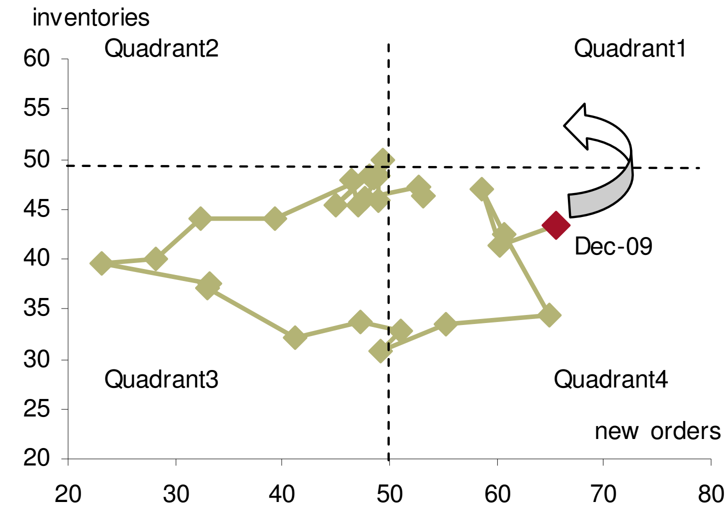
Source: US EIA, BEA.

Distilled Bounce, Cont'd

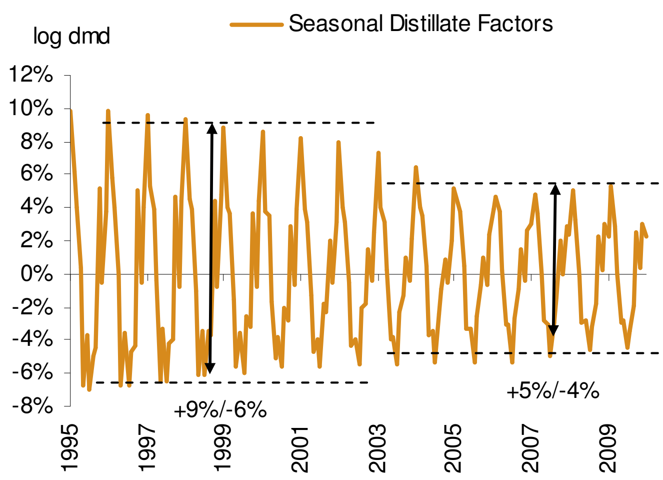
Continued industrial inventory restocking activity and seasonal factors

- Data from the ISM show a surge of new orders, but still below-average inventory levels, leaving room for more stock-building activity.
- On top of the secular increases from continued industrial activity, there are seasonal factors, which though recently diminishing in magnitude, still may account for another +150kb/d of demand.
- Altogether, the 300-350kb/d of demand promises to make a noticeable dent in the massive distillate inventory overhang.

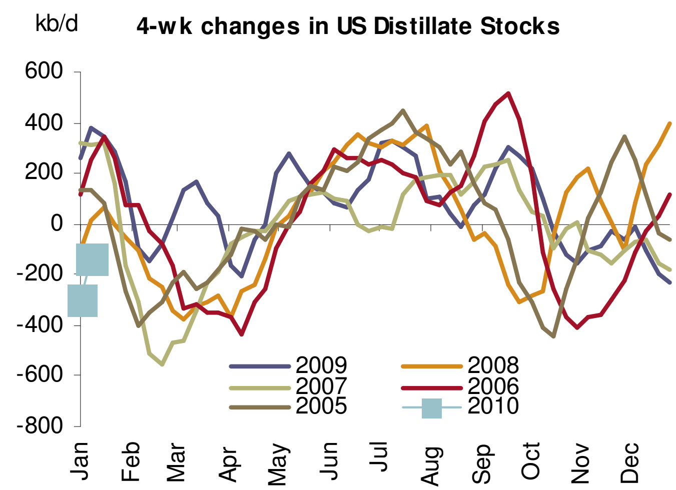
ISM Inventory/Order Cycle



Seasonal movements in distillate demand



4-week average distillate inventory movements



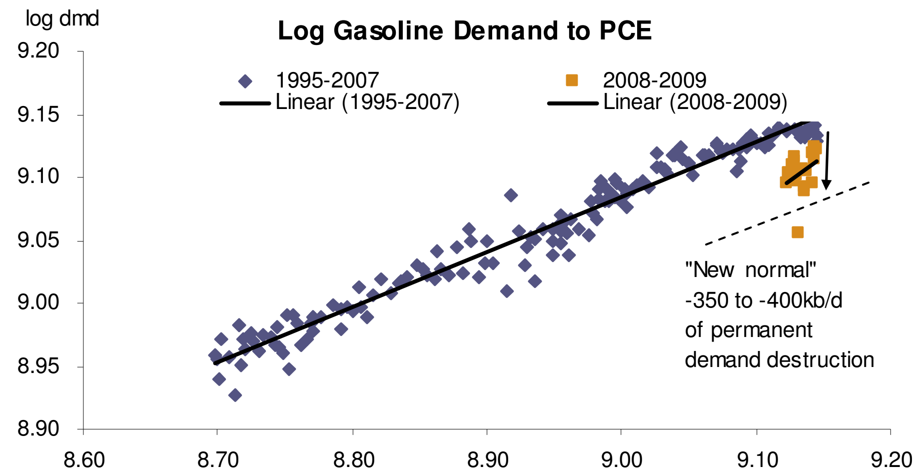
Source: Bloomberg, EIA, LCM Research.

The “New Normal” for Gasoline

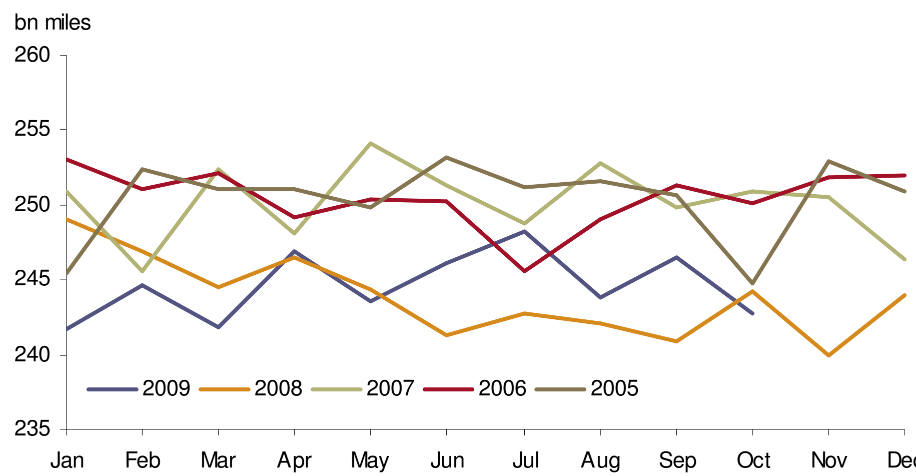
Driving habit shifts and vehicle efficiency have permanently destroyed demand

- In contrast to distillate’s stable relationship with industrial activity, gasoline demand has broken the historic relationship it had sustained with personal expenditure.
- Unlike distillate, gasoline demand features a larger discretionary component subject to the whims of the consumer decision-making and the health of their wallets. And consumers have decided, in light of a weak labor market and continued credit constraints, to cut back on their driving.
- Vehicle miles-travelled, typically around or above 250bn miles-travelled, has dropped by an average 6bn miles-travelled in 2008-09. And these shifts in driving habits will likely be a permanent feature of the broader shifts in personal expenditure away from durable and non-durable spending, and remain resilient to a headline economic recovery.

Industrial production to distillate demand



US motor vehicle miles traveled, 2005-2009



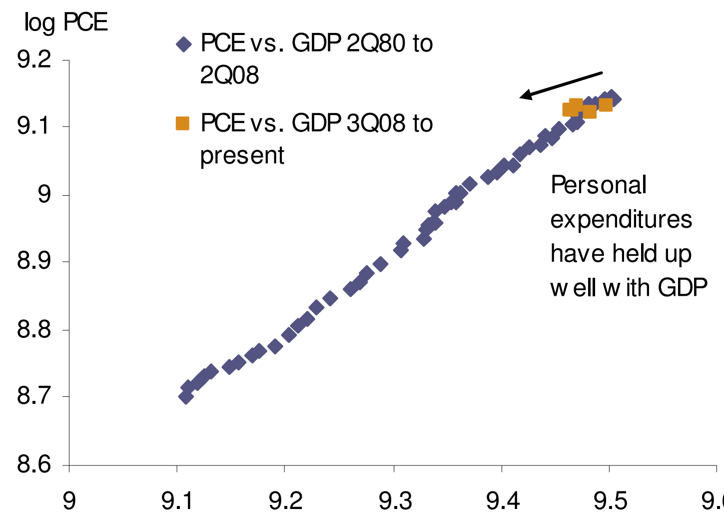
Source: US EIA, BEA.

"New Normal," Cont'd

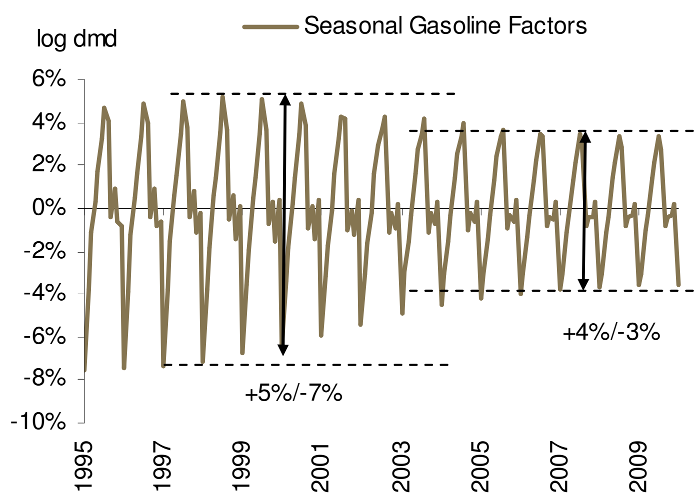
The gasoline downshift is part of a broader consumer spending reorientation

- On top of behavioral shifts, the US government has moved ahead with vehicle efficiency standards and bio-fuel mandates. 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.
- While initiatives for improved efficiency standards dated to before the onset of the recession, the crisis and cash-for-clunkers programs have accelerated fleet efficiency gains as consumers switched from thirsty SUVs and light trucks to more efficient compact cars.
- This suggests that gasoline demand may have peaked , and would operate under a "new normal" -350 to -400kb/d lower than past levels, added to another -250kb/d in seasonal demand weakness for Q1 2010.

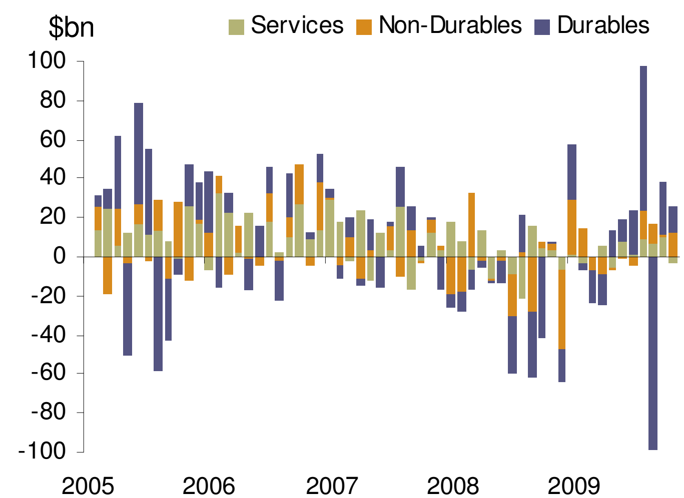
GDP and Personal Expenditure



Seasonal movements in gasoline demand



M-o-m changes in Personal Spending Components



Source: Bloomberg, EIA, LCM Research.

Return of oil.com

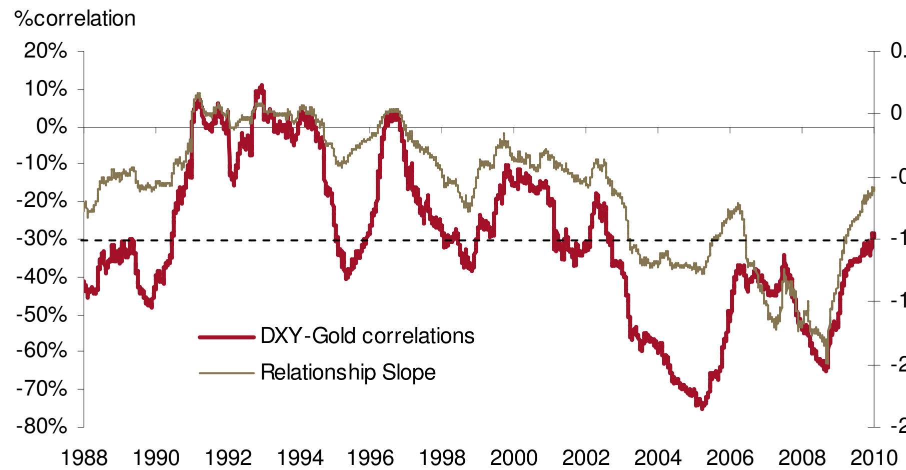
Returning risk appetite, inflation fears, and FX weakness drive financial investment into oil

Oil matures from a peripheral to an integrated asset

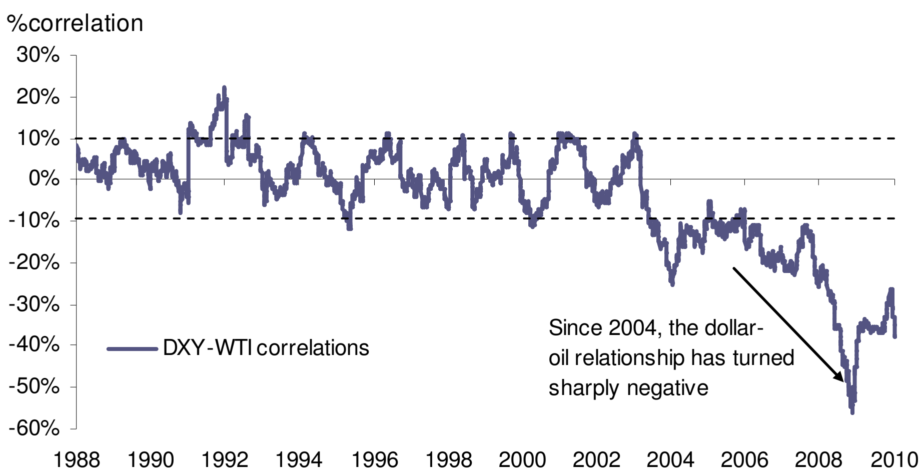
Macro themes of a global risk recovery, dollar weakness, and inflation risk

- Historically, oil and other commodities have reflected local and global demand/supply balances, but had little systematic relationships with other macro asset classes such as the US dollar exchange rate or equities.
- But recently, oil and other commodities have recently been unusually sensitive to movements in dollar, equity, and inflation movements, even more so than gold, the traditional commodity asset class of choice.

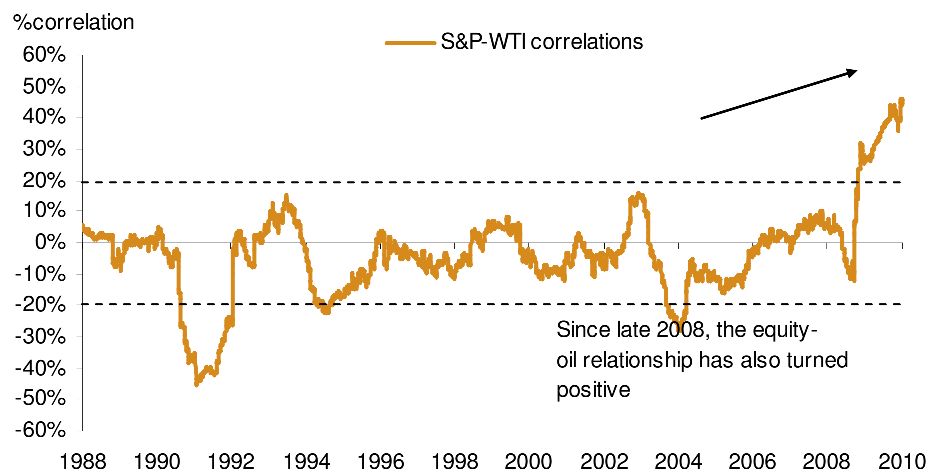
Historical Gold/DXY Correlations



Historical WTI/DXY Correlations



Historical WTI/S&P Correlations



Source: Bloomberg, LCM Research.

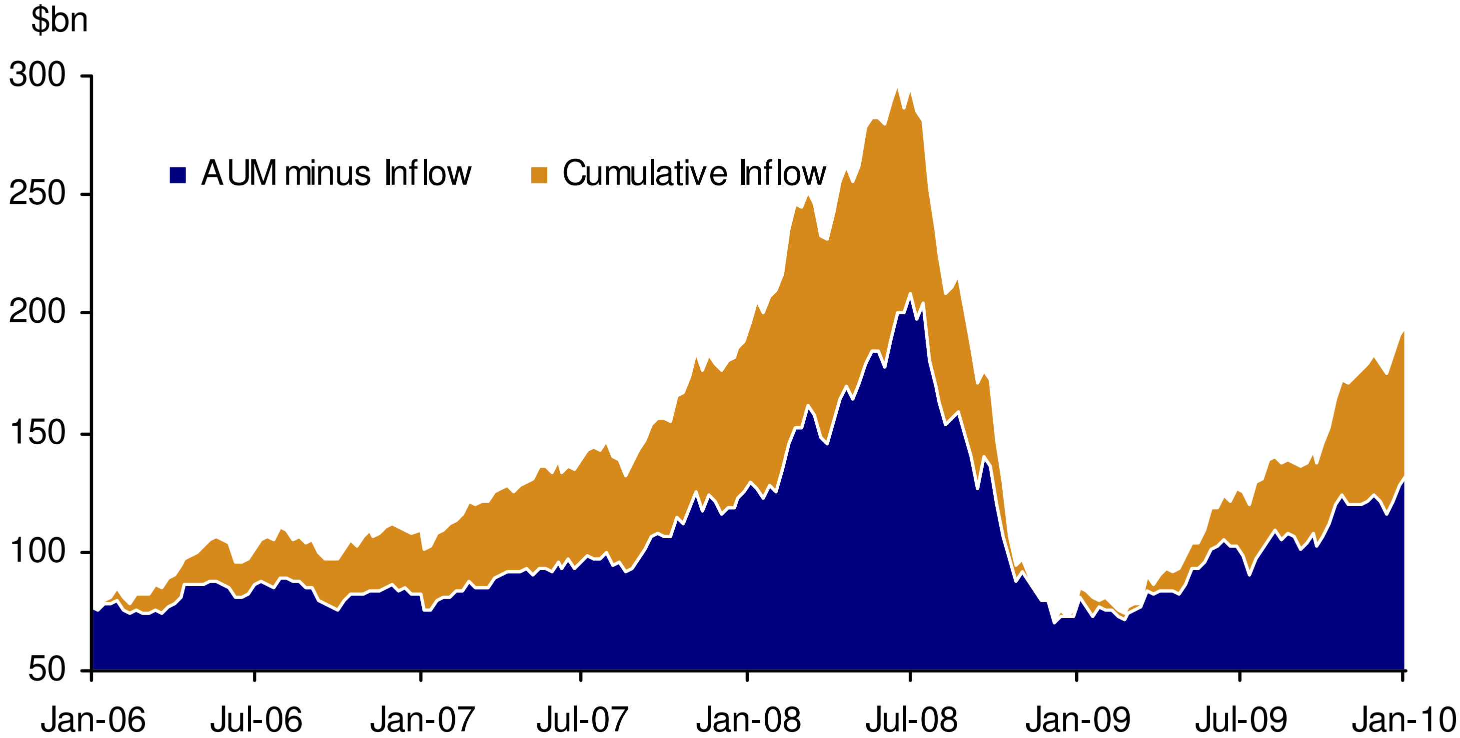
The elephants of the pits: passive index investors

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

Rise of passive commodity indices

- 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 $300bn in Jul-08, before plummeting. Recently, they have grown again to approach $200bn.
- After large liquidations from July 2008 to January 2009, we are seeing financial investment flow in oil and other commodities return with a vengeance, which 2010 rebalancing only paused.

History of AUM and cumulative inflows into passive commodity indices



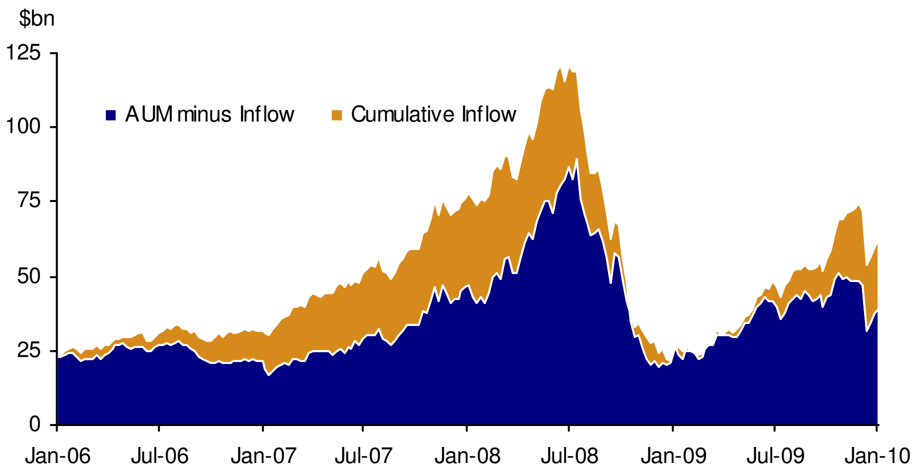
Source: Bloomberg, CFTC, GSCI, DJ-AIG, LCM Research.

Return of both general indices and oil-specific ETFs

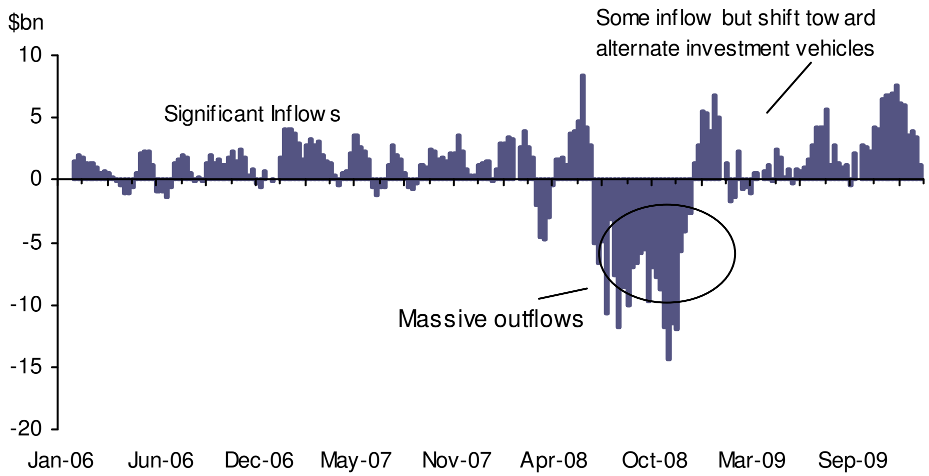
Data on the cost of production see the strongest rate of deflation in decades

- 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 2009 also saw the emergence of oil and gas-related ETFs, such as USO and UNG, which grew even as index AUM fell.

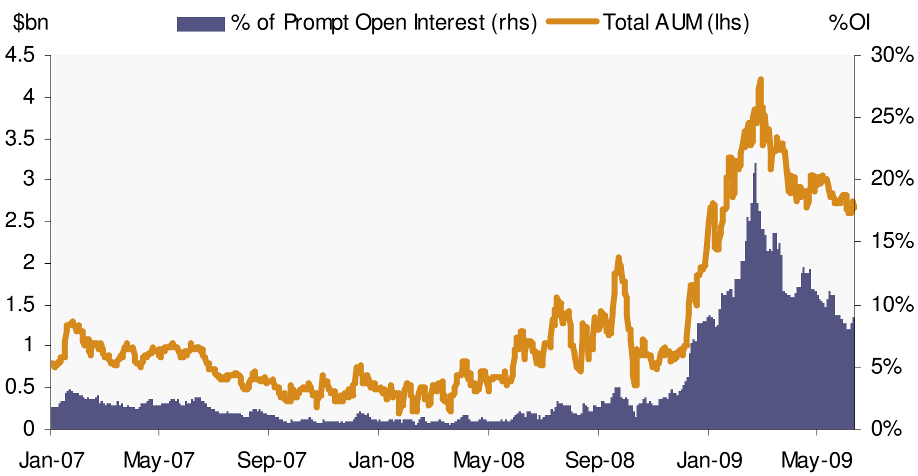
Index AUM in WTI and Brent



Net Index Inflows into WTI and Brent



The Rise and Fall of Oil ETFs



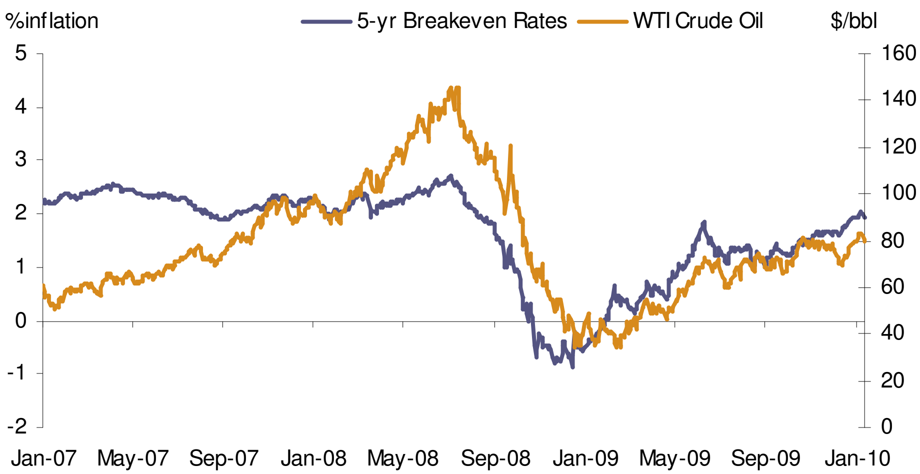
Source: BLS, LCMC Research.

Commodities seem to be pricing in high levels of inflation

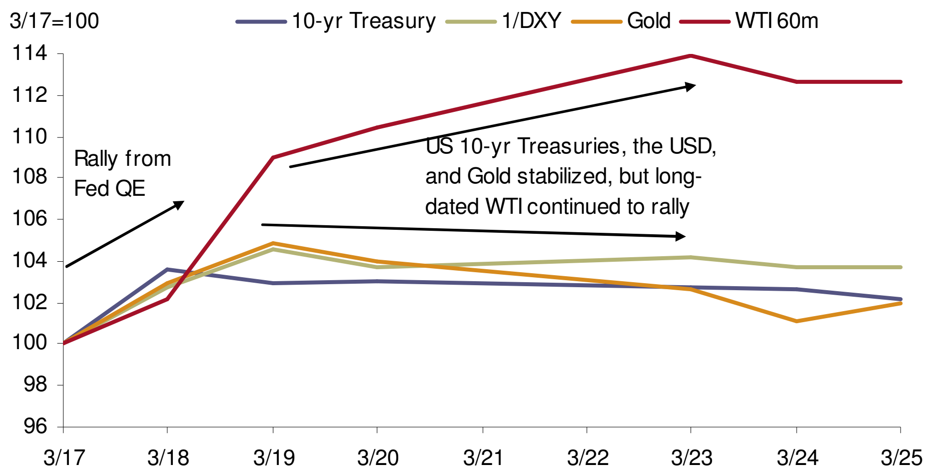
Financial investment into commodities have returned in force

- 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



Source: Bloomberg, LCMC.

QE QED

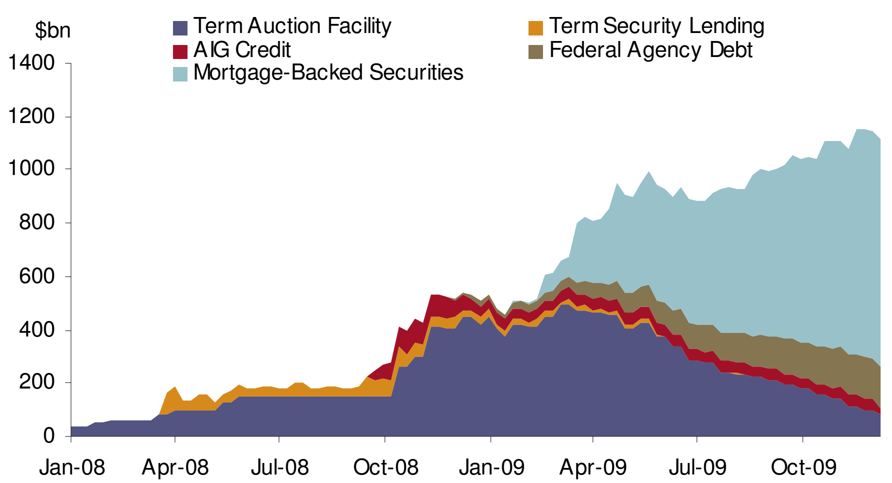
Heavy QE programs, fiscal balance deterioration
set stage for inflation/currency fears

The March of the Plumbers: the Fed

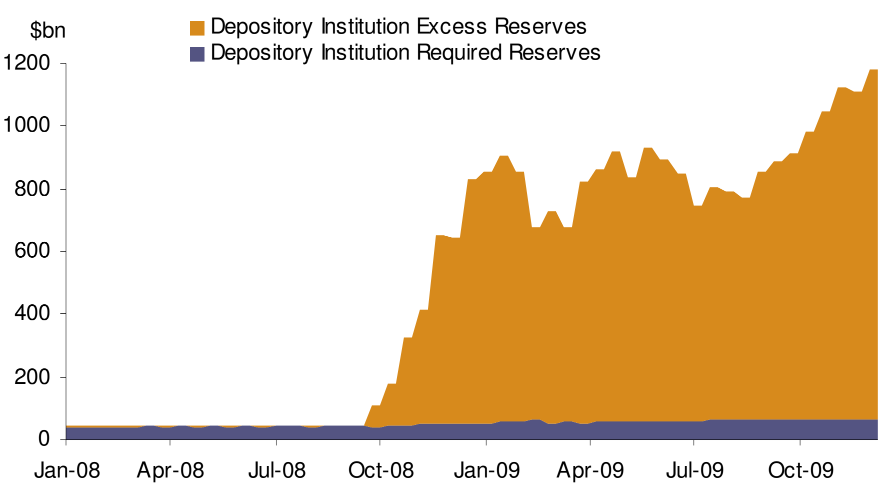
Commercial banks have increased excess reserves comparable to QE injections

- Facing a frozen credit market and the threat of a deflationary spiral, central banks have drastically loosened monetary policy. The Fed has been notable in pushing interest rates to effectively zero and pursuing asset purchases in a dramatic "quantitative easing" experiment.
- The Fed's purchases of mortgage-backed securities and institutional debt has seen the "unconventional" portion of its balance sheet rise to over $1.2tn, pushing their total balance sheet from pre-crisis levels around 8.4% of GDP to over 22% of GDP.
- However, the systemic hoarding by commercial banks of the liquidity injections in the form of reserves have raised fears of an inflationary surge once credit conditions ease sufficiently to drive the excess money supply into the system.

Fed QE asset purchases, Jan-08 to present



Depository Holdings at Fed, Jan-08 to present



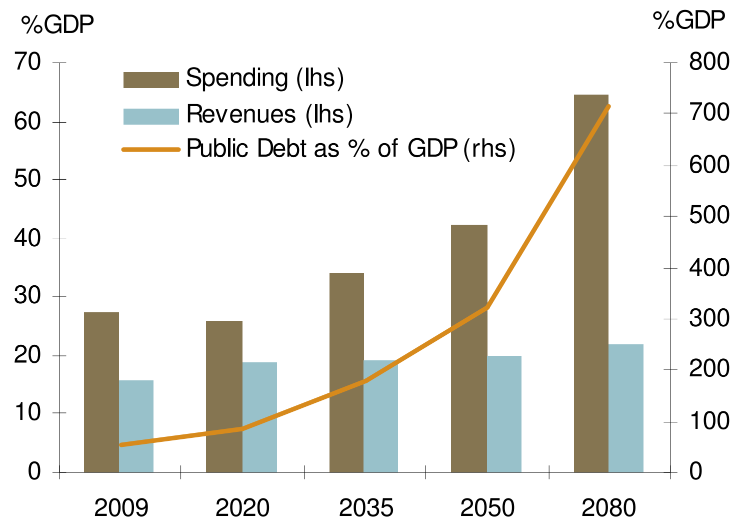
Source: Bloomberg, LCM Research.

Debt Troubles

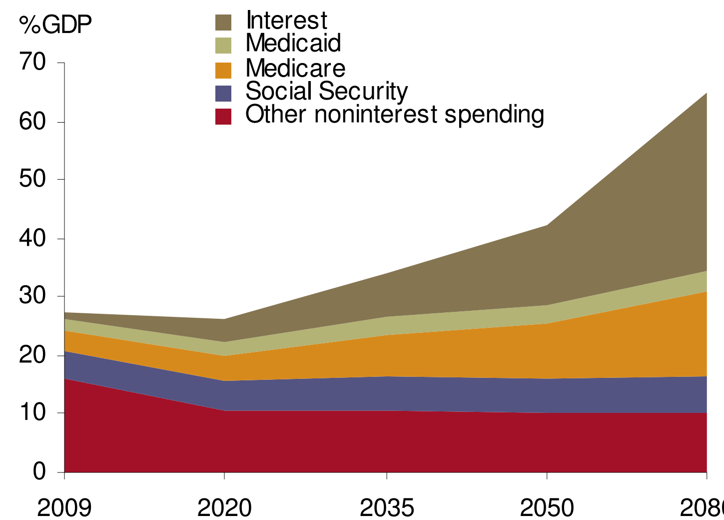
Medium-term projections show grim US public finance picture

- On top of the pressures from QE, the US legislature has largely failed to present a credible plan to bring medium-term deficits under control. The CBO forecasts that unless dramatic cost savings are achieved in the fast-growing Medicare/Medicaid and Social Security liabilities, public debt could soar to nearly 200% by 2035 and 300% by 2050.
- The pressures of servicing these deficits have grown as foreigners, notably the Chinese, have grown increasingly reluctant to fund them through US Treasury purchases at remarkably low rates of interest.
- This has raised market fears of a potential "monetization" of public liabilities through irresponsible use of the printing press, sparking a ruinous inflation or stagflation last seen in the 1970s.

CBO alternative scenario for US federal budgets



Components of CBO fiscal spending projections



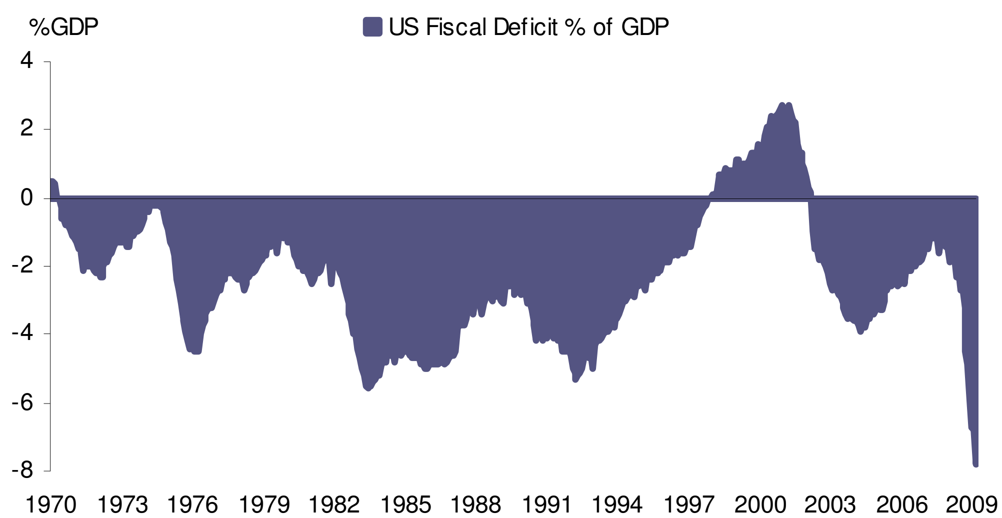
Source: Bloomberg, LCM Research.

Whither inflation?

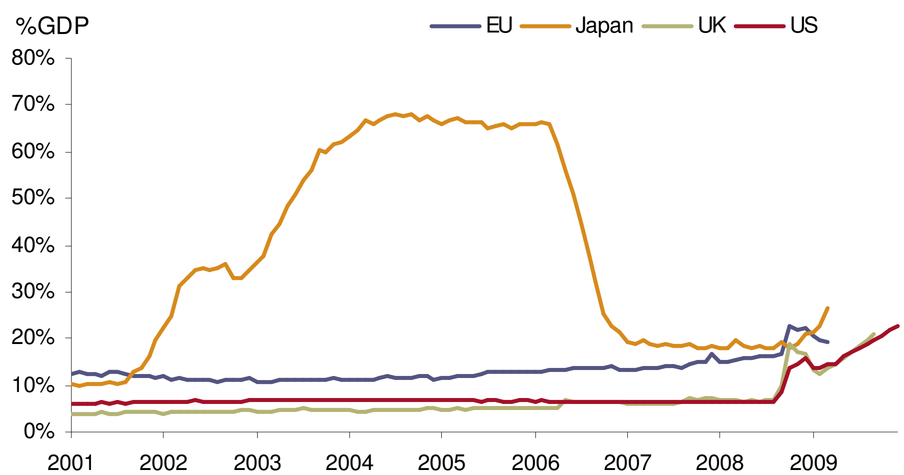
Combination of QE and fiscal deficits has stirred fears of high inflation

- 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

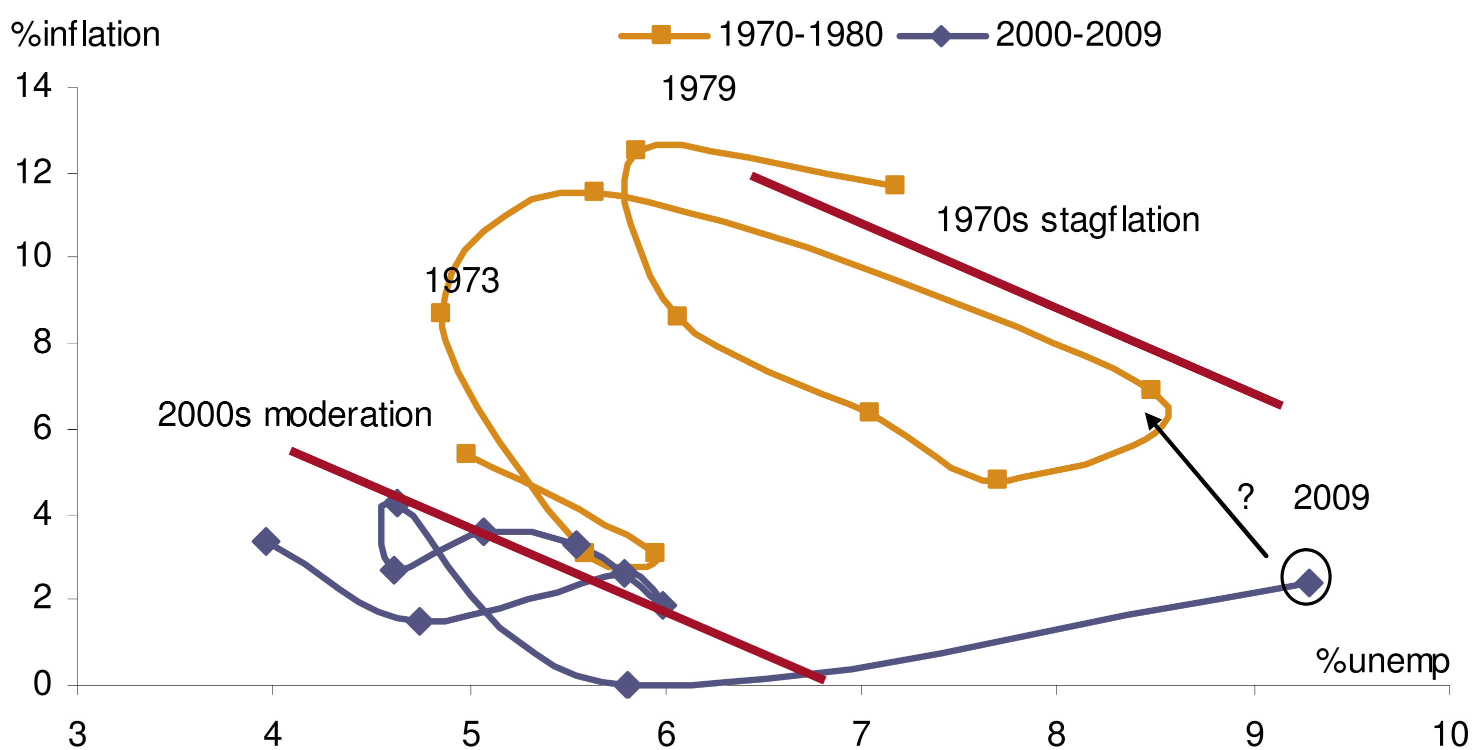


Source: Bloomberg, LCM Research.

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 backfired.
- 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



Source: St. Louis Fed, LCM Research.

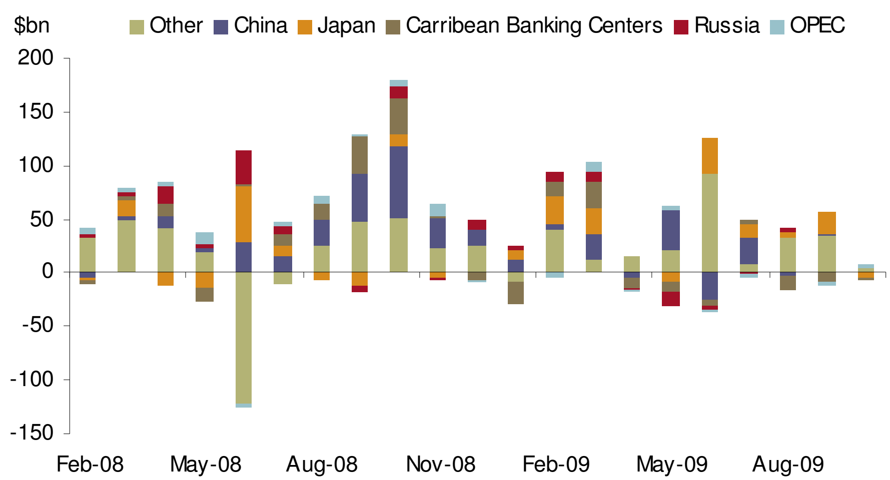
For a Rainy Day

The dollar had been artificially pushed through flight-to-quality and its reversal

- Despite concerns over the sustainability of US fiscal and current account deficits, the verdict of international investors has thus far 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. Already, China has reduced its net Treasury purchases to virtually nothing by November.
- Nevertheless, the even economic poorer outlook and budgetary troubles from the other mature economies such as the EU and Japan, has led to a recent stabilization of the dollar against a trade-weighted basket

US Trade-weighted dollar

Net foreign purchases of US Treasuries



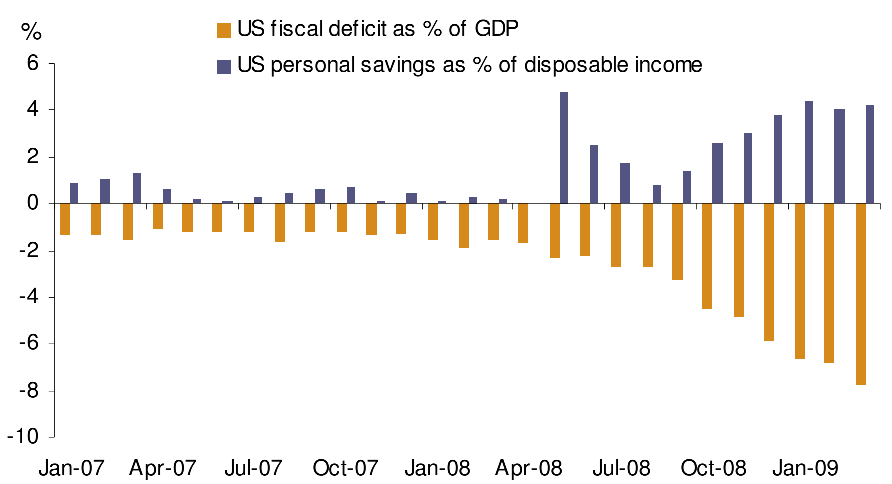
Source: Bloomberg, US Treasury, LCM Research.

Reservations over the reserve currency

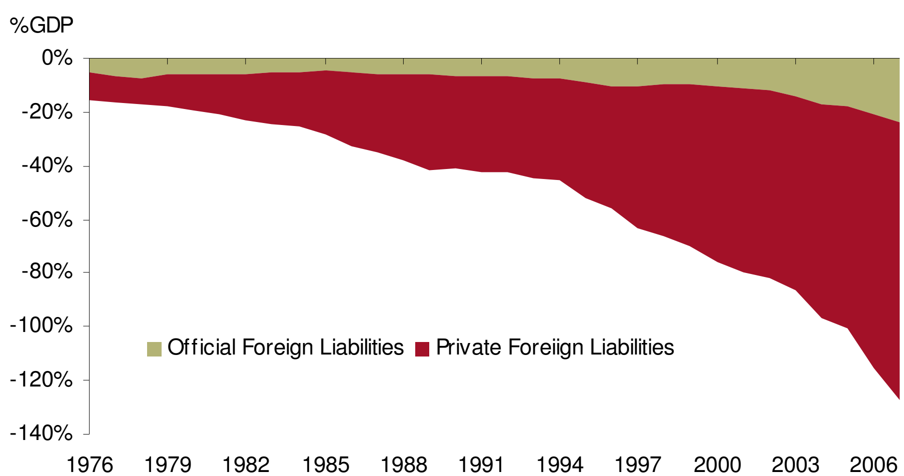
The US is substituting private borrowing with public borrowing

- 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



Source: Bloomberg, BEA, LCM Research.

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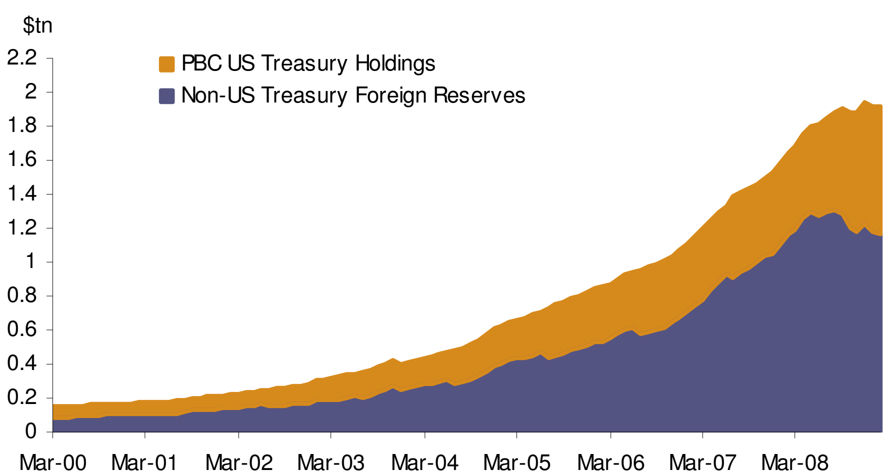
Exorbitant privileges of currency adjustment

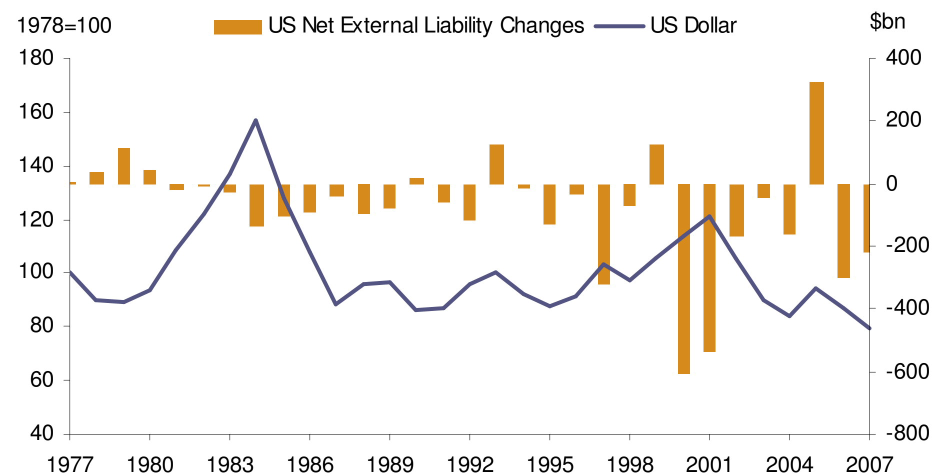
Weakness in the USD may deflate away external liabilities

- 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



Source: People's Bank of China, State Administration of Foreign Exchange, US Treasury, LCM Research.

Daniel P. Ahn
Director of Macroeconomic Research
Head of Quantitative Portfolio Strategies
dahn@louiscapital.com
212.651.3198

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