

CME Group Fundamental Analysis Market Education

Key Markets And Their Drivers

Goals Of Section

- Develop an understanding of the fundamental drivers for various classes of futures
- Develop an understanding of what to look for in the news and data when trading these market groups

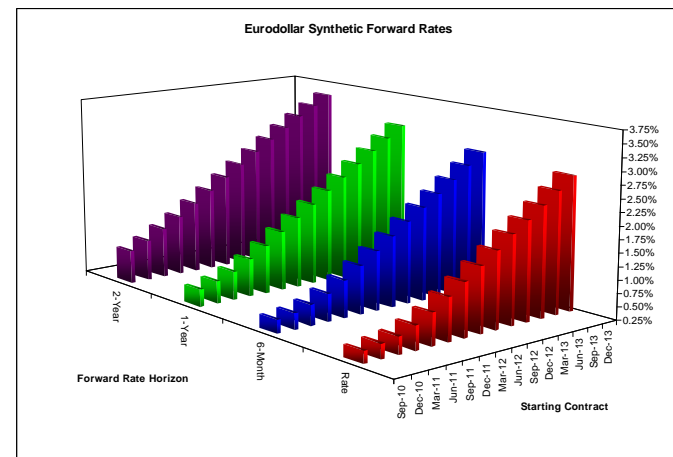
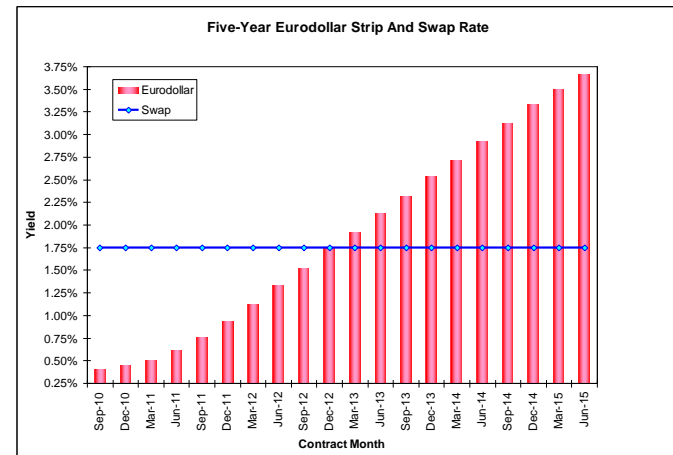
Short-Term Interest Rates

The Price Of Money

- The 90-day Eurodollar futures contract is the rate at which dollar loans can be locked in at the contract's expiration
- The Eurodollar market reflects not only the short-term supply/demand balance for 90-day deposits but expectations for future short-term rates
- The demand to lock in future borrowing costs in forward-rate agreements reflects expectations for changes in both monetary policy and loan demand
- The interest rate swap market is based on the price of trading a calendar strip of Eurodollar futures

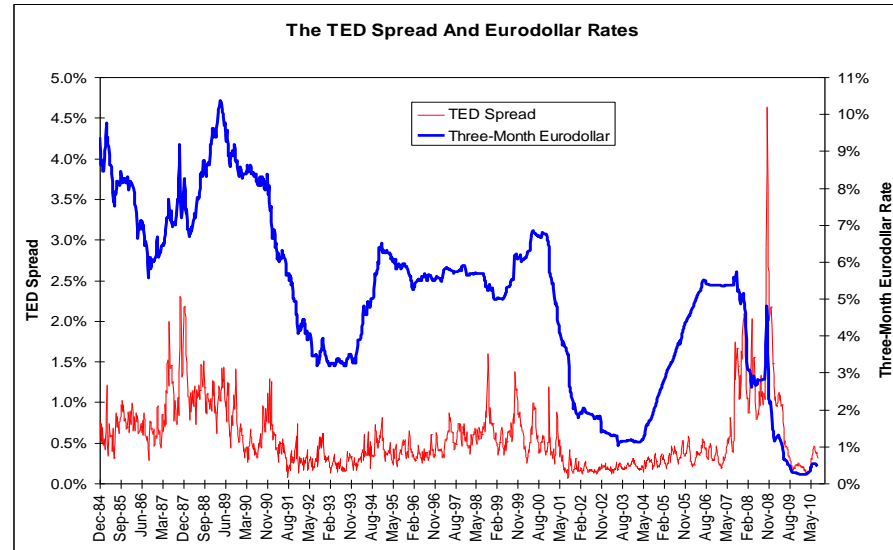
Swap & Forward Rates

- The level and shape of the Eurodollar forward curve sets the “fixed” leg of an interest rate swap (top)
- The interest rates between months implied by the Eurodollar forward curve form the basis of forward rate agreements (bottom)



The TED Spread

- Because Eurodollars are deposits held outside of the U.S., they are uninsured and not subject to direct regulation
- This makes Eurodollars subject to the credit risk of individual banks; the degree to which this exceeds the rate of 90-day Treasury bill rates is called the TED (Treasury-Eurodollar) spread



Drivers Of Short-Term Rate Expectations

- Supply Of Funds
 - Central bank policies
 - This includes statements by the Federal Open Market Committee and various Federal Reserve officials
 - Creation of various special facilities during the 2008-2009 financial crisis, including the establishment of swap lines to other central banks, expanded credit in the offshore banking system and drove LIBOR lower
 - [Federal Reserve data](#)
 - Factors Affecting Reserve Balances (H.4.1 report) are released at 0430 EST on Thursday
 - The money supply data are reported weekly on Thursdays at 1630 EST
 - The St. Louis Federal Reserve reports its “zero maturity” money supply on Mondays

Drivers Of Short-Term Rates (Cont.)

- Assets & Liabilities of Commercial Banks (H.8) are released at the end of the month for the preceding month
- Demand For Funds
 - Household finance
 - The Federal Reserve's G-19 and G-20 reports are released quarterly on consumer credit and finance company lending, respectively
 - The Flow of Funds accounts report (Z.1) is released during the second week of March/June/September/December for the previous quarter on household assets, debt levels and debt service
 - Commercial & Industrial loans
 - The Federal Reserve releases commercial paper outstanding data before 1000 EST on Thursdays

Drivers Of Short-Term Rates (Cont., 2)

- The Eurodollar market tends to have more predictable reactions than most other markets and it tends to trend in one direction for very long periods of time
 - Expect the absolute level of short-term interest rates inside the first year (the “white strip”) to rise on any indication of
 - Tighter monetary policy
 - Stronger than expected economic data, especially for employment and industrial production
 - Expect the TED spread to widen on any indication of credit trouble at a major global bank
 - Expect the yield curve to flatten on any indication of tighter monetary policy

Long-Term Interest Rates

Drivers Of The Yield Curve

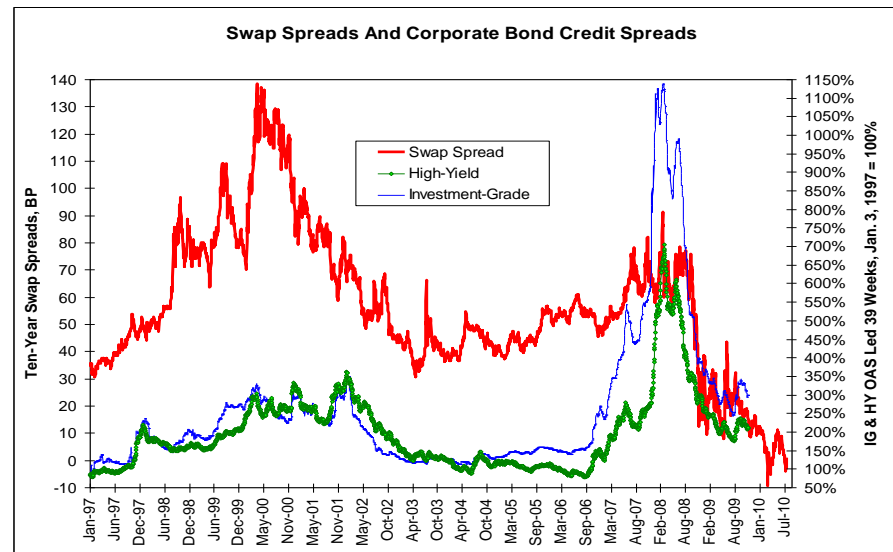
- The yield curve, the pattern of interest rates across maturities, is one of the most closely followed of all financial markets
- Theories abound on its shape. They include
 - Liquidity premium
 - Preferred habitat
 - Market segmentation
 - Value of convexity
- Regardless of theory, all can agree the yield curve is set continuously in the market by a collective expectations for future short-term interest rates

Treasuries And The Mortgage Market

- Prior to the mortgage market meltdown beginning in 2007, one of the biggest drivers of the Treasury market was refinancing of mortgages
- The disruption of the mortgage market post-2007 forced many conservative fixed-income investors out of mortgages and into Treasuries
- The Federal Reserve's purchases of \$1.25 trillion of mortgage-backed securities in 2009-2010 also forced many conservative investors into Treasuries as the mortgage market was dominated by the Federal Reserve's activities

Treasuries And Corporate Bonds

- Investment-grade corporate bonds are priced as a spread to either Treasuries or the swap market
- A flight from corporate bonds, as occurred in 2008, pushes up demand for Treasury bonds in a flight-to-safety
- When these spreads narrow, the trade does not unwind; both Treasury yields and corporate yields can fall together



Treasuries And Municipal Bonds

- The post-2007 recession lowered the credit quality of many state and local (municipal) borrowers
- The tax-equivalent yields of many of these bonds rose over Treasury yields
- More than \$180 billion of the February 2009 federal stimulus package went to provide relief for municipal borrowers
- Once again, financial stress led to a flight into Treasuries

Treasuries And Currency Management

- One of the larger factors in the Treasury market over the past decade has been the purchases by China and Japan for purposes of either pegging or weakening their currency
- If the Peoples' Bank of China or Bank of Japan buys Treasuries, directly or indirectly, it puts upward pressure on the dollar and downward pressure on either the yuan or the yen
- These purchases also improve the ability of the U.S. to import goods from China and Japan

Tracking Foreign Purchases

- The Treasury Department tracks purchases and sales of U.S. securities in its monthly [Treasury International Capital System](#) report
 - This is released monthly on or about the 11th business day of the month with a one and one-half month lag, i.e., mid-August for June
 - As the data are reported by domicile of the purchaser, they can be misleading; a Japanese bank in the Cayman Islands is identified not as a Japanese purchaser but rather a tax-haven purchaser

Tracking Inflation Expectations

- Treasury Inflation-Protected Securities (TIPS) were introduced in January 1997
- Their payoff is linked to changes in the All-Urban Consumer Price Index (CPI-U) over their holding period
- The yield spread between conventional Treasuries and TIPS is called the breakeven rate of inflation

Tracking Currency Volatility

- In practice, this is more difficult than it appears
- Japanese yen volatility is easy to track, but the Chinese yuan is still heavily managed
- The heavily traded European currencies' volatilities are easy to track but have little direct effect on the yield curve

Drivers Of Long-Term Interest Rates

- Bonds often trade as safety vehicles
- Any news of higher inflation, stronger than expected economic growth or of more compelling investment alternatives tends to push yields higher (prices lower)
- Alternatively, bad economic news relating to slower growth or higher expected inflation tends to push yields lower (prices higher)
- As the dollar value of a basis point rises as maturity lengthens and as interest rates fall, bond prices become more volatile in these environments

Major Currencies

The Original Theory

- The argument for floating exchange rates in the late 1960s and early 1970s had been based on the concept of self-correcting trade imbalances
 - A country in deficit's currency would weaken and make its exports cheaper and its imports more expensive
 - A country in surplus' currency would strengthen and make its exports more expensive and its imports cheaper
- This was a legacy thought process from the days of fixed exchange rates when countries in deficit eventually lost their ability to import more

Factors Driving Currencies

In order of importance, permanent factors:

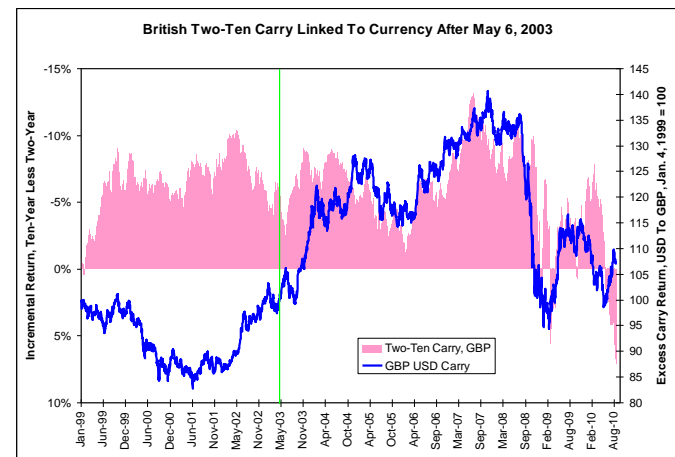
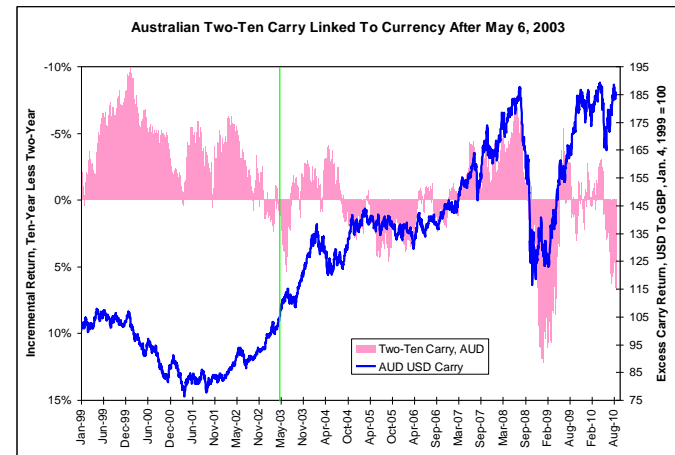
- Expected interest rate differentials
- Expected differential returns on assets
- Commodity linkages
- Physical trade flows

Non-permanent factors:

- Financial crises
- Carry trade dynamics
- Political crises

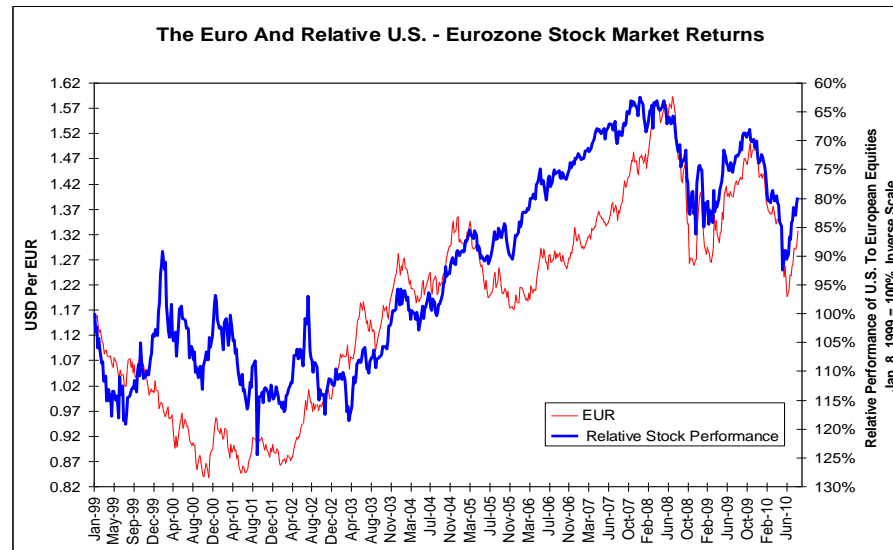
Expected Interest Rate Differentials

- The excess return on borrowing the U.S. dollar and lending into the Australian dollar (top) and British pound (bottom) matches the shape of their domestic yield curves
- Borrowing short in one currency to lend long in that currency and borrowing short in one currency to lend short in another currency are alternative trades
- Both are carry trades and depend on low short-term interest rates



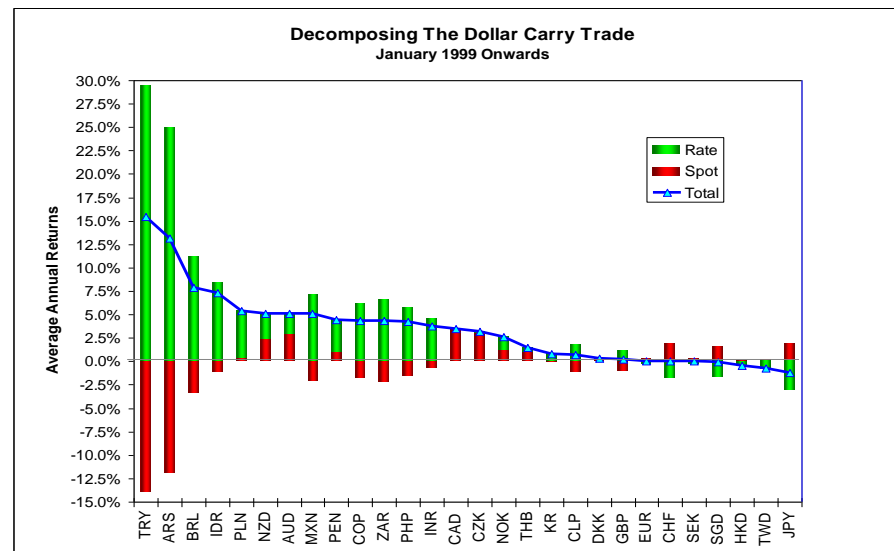
Returns On Assets

- Capital flows into other stock markets affect currency rates
- International equity investing has been turning into a currency trade in disguise
 - This is especially true in a world where exchange-traded funds blur the returns on individual stocks in favor of returns on indices



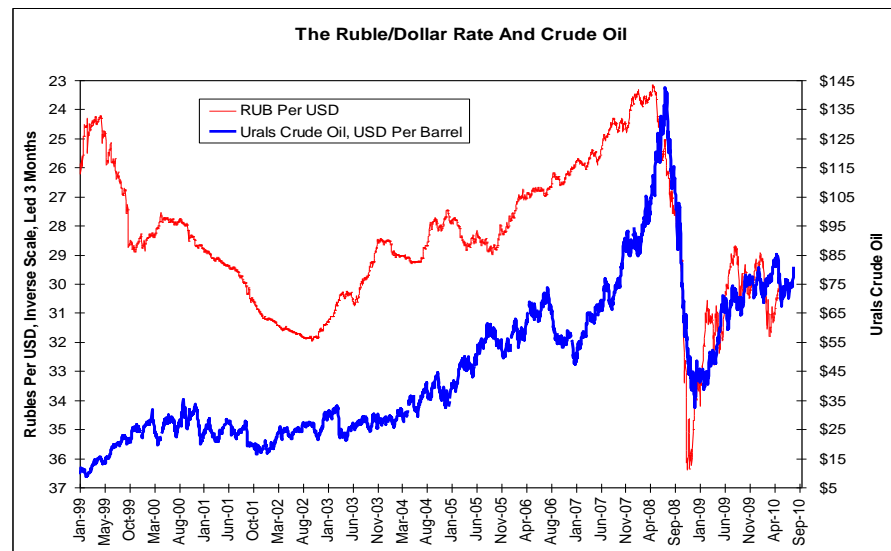
The Carry Trade

- Carry trade returns (blue line) can be divided into two parts, the interest rate return (green) and the spot rate return (red)
- Some currencies with high interest rates can maintain their currencies...but at the cost of lower growth



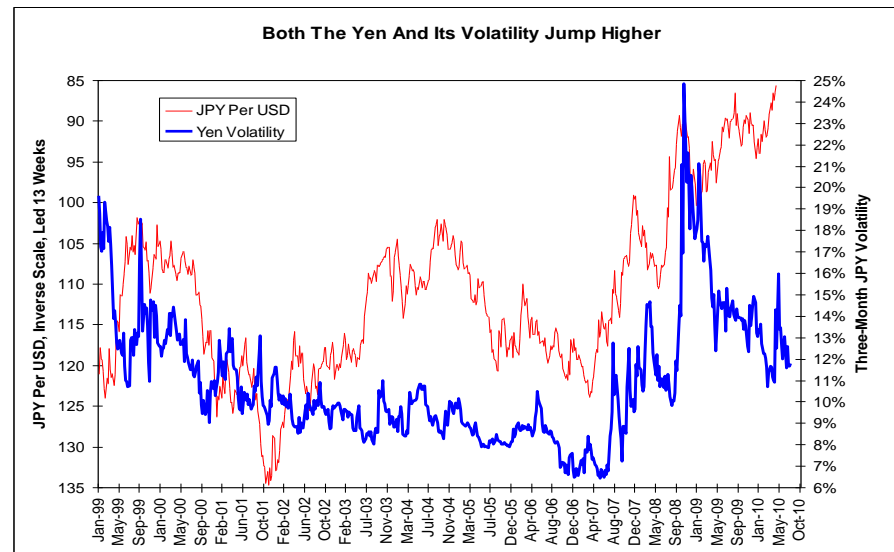
Commodity Linkages

- Some commodities are so important to their country's export picture the currency becomes linked thereto
- An example is the Russian ruble and crude oil prices
- These linkages are not as common as supposed



Must-Do Trades

- Some countries run near-permanent and persistent trade surpluses
- No matter how poorly that country's economy is doing or how low its interest rates are, importers must buy that currency to pay their exporters
- The Japanese yen is a classic example of this and of those who have borrowed it for carry trades scrambling to repay the loan



Professional Currency Trading

- Professional currency traders' styles fall into four categories:
 - Fundamental valuation
 - Trend-following
 - Volatility
 - Carry
- Over time, carry trading has dominated the other three styles

Drivers Of Currencies

- No set of markets demonstrates the maxim, “There is no right answer, only a right answer for the moment,” as much as currencies
- While it may seem currencies would react positively to the prospects of higher short-term interest rates, stronger economic growth or lower inflation, these reactions often run into countering forces

Stock Indices

The Most Difficult Market

- Stock prices represent the discounted stream of expected dividends
- As dividends are paid out of earnings, this involves making an earnings forecast
- As the discount rate involves both Treasury rates and the corporate credit spread, this involves making two interest rate forecasts
- As investors can be increasingly or decreasingly risk-seeking, this involves assessing investors' future mood

Drivers Of Stock Prices

- Stock prices tend to be forward-looking and lead developments both in the firm's prospects and the economy as a whole by six to nine months
- They are not, however, GDP futures: Stock prices can do best in slow growth environments wherein firms can earn well and the Federal Reserve is not tempted to raise short-term rates
- Indexation can drive stocks up and down together in the short-term without regard to an individual firm's prospects
 - In the long-term, the firm's prospects are more important

Drivers Of Stock Prices (Cont.)

- U.S. equities trade in a 24-hour global market. What happens elsewhere in the world affects U.S. stock prices
- There are no simple rules as to what the stock market “likes” in other markets
- As financial liquidity can move into stocks faster than it can into plant & equipment, stocks tend to react well to looser monetary policy
- Stocks are easier to sell at a higher price in a bull market than at a bear-market discount

Stocks Vs. Corporate Bonds

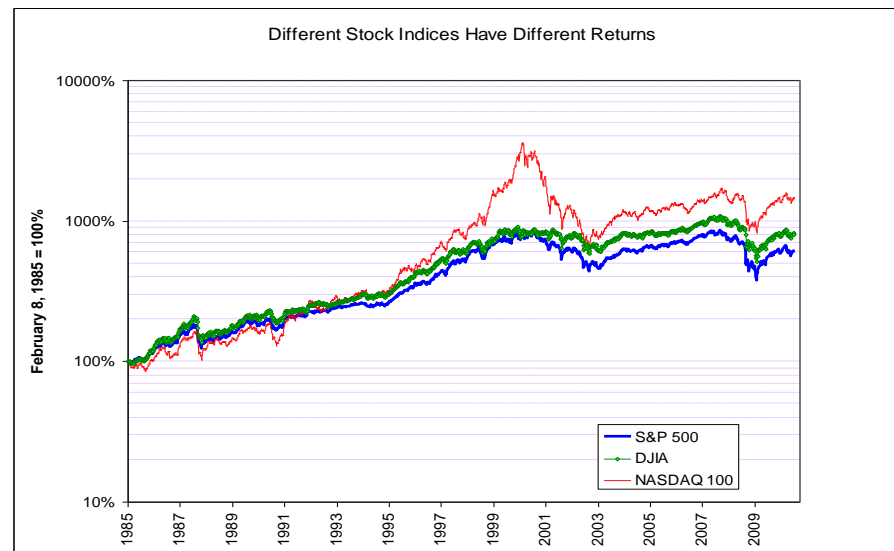
- Both stocks and corporate bonds are claims on corporate cash flows
- As a general principle, if the credit risk of the bonds is rising, the stock will perform poorly
- Bondholders get paid before common shareholders and have first claim in bankruptcy
- Actions taken to benefit shareholders can hurt bondholders

Stock Indices Are Not Stocks

- A stock can disappear via bankruptcy or other corporate action. This is unlikely to happen to an index
- On the other hand, an index cannot be acquired for control purposes and jump in response to a takeover bid
- All stock indices have a survivor bias: As issues disappear, they are replaced with newer and presumably more vibrant companies
- When an index is rebalanced and reconstituted, its characteristics change

Stock Index Spreads

- Different stock indices have different sector weights, dividend yields, weighting schemes and volatility
- The choice of index benchmarks by institutional investors changes the money flow into and out of that index and becomes an important fundamental itself



The Agency Problem

- Most stock trading is done by agents of the investing principal, not by the principals themselves
- As agents are competing with each other for assets under management, their interests and risk-acceptance levels often are different than their principals'
- Agents often have a mandate for how they invest; this gives them an incentive to buy first once a selloff is underway and it virtually compels them to buy once a rally begins

The Great Tailwind

- While stocks are not GDP futures, earnings growth over time tends to grow along with both U.S. and global GDP
- This gives stocks a tailwind: As economies tend to grow over time and as companies become more efficient and as new industries emerge, stocks become excellent long-term investments
 - In mathematical terms, this is called a “geometric Brownian motion process with a positive drift term”

Tracking Stock Indices

- Despite all the caveats, on balance stocks react positively to improving news on GDP and all of its components
- Bad news can be good news if the bad news means more liquidity coming into the market
- Conversely, good news can be bad news if it is seen prompting interest rate hikes
 - Watching short-term interest rate reactions after these news events often provides the clue as to stocks' reactions

The Energy Complex

Crude Oil

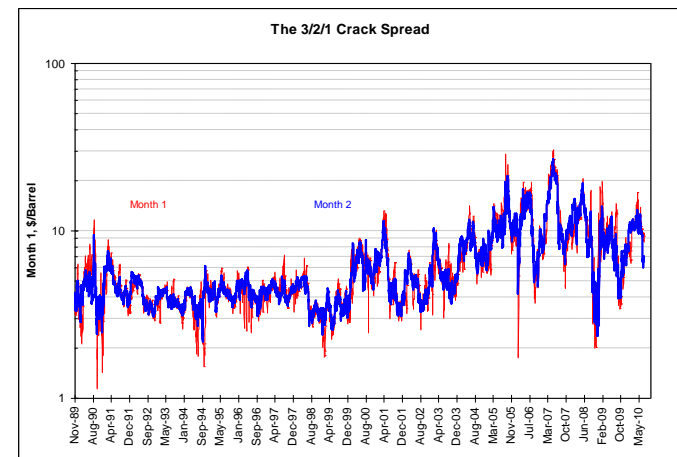
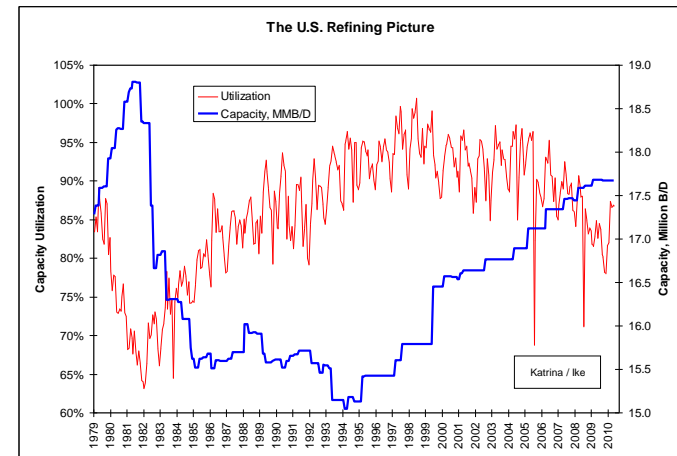
- The benchmark grade traded in the U.S. market is West Texas Intermediate (WTI) delivered to the pipeline terminus at Cushing, Oklahoma
- This is a “sweet,” or low-sulfur grade of crude oil
- High-sulfur, or “sour” crude oils trade as a spread to WTI
- Waterborne cargoes at the U.S. Gulf Coast often are traded as a spread to WTI
- Pipeline deliveries from Alberta in Canada to the U.S. market are traded as a spread to WTI

Refined Products

- Both heating oil and RBOB (Reformulated Blendstock for Oxygenate Blending, the base for gasoline) are priced at New York Harbor
- Other refined products include heavy (“residual”) fuel oils, asphalt, paraffin, aviation gasoline and naphtha
- Demand for refined products and the inventory build-and-draw cycle in crude oil are the ultimate drivers of crude oil prices

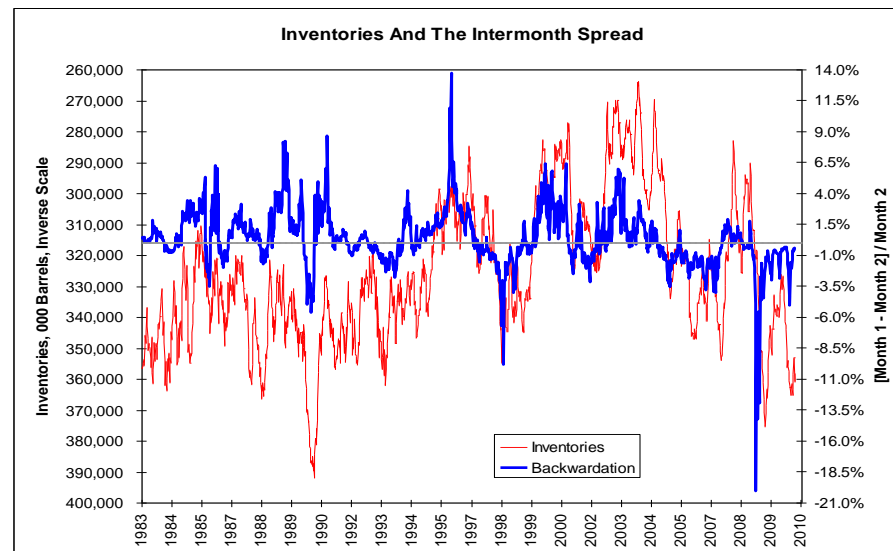
Refining Utilization And Margins

- Rates of refining capacity utilization (top) affect refining margins, or “crack spreads” (bottom)
- Higher utilization also affect crude oil spreads; it leads to increased demand for the more expensive sweet crude oil
- As it is difficult to increase U.S. refining capacity, the U.S. often import refined products



Crude Oil Storage

- When the front-month futures move into a substantial discount to the second month, the cash-and-carry storage trade at Cushing becomes profitable
- That trade and others like it worldwide pushes crude oil prices higher than they would be otherwise, but provides readily available crude oil supplies to the U.S. market

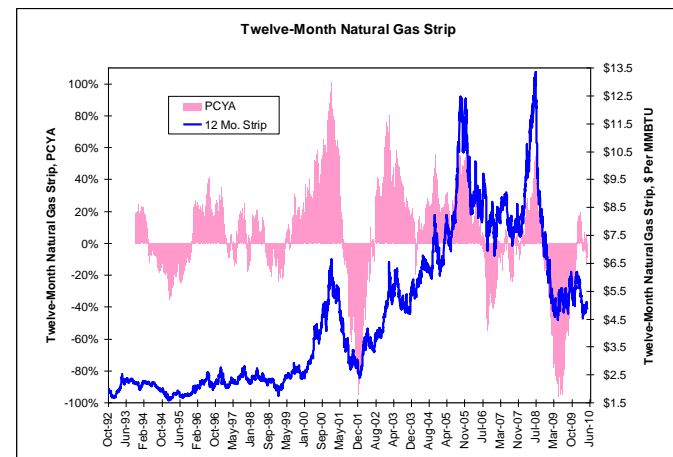
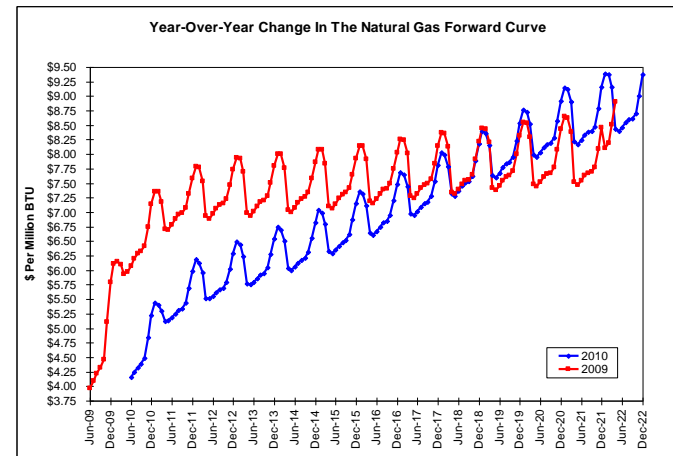


Natural Gas

- The benchmark contract is for delivery at Henry Hub, Louisiana, a point where numerous pipelines intersect
- Both the supply and demand for natural gas are “inelastic;” a small change in quantity leads to a large change in price
- As a great deal of natural gas demand is for space heating, its forward curve is highly seasonal
- While global trade in liquefied natural gas (LNG) is growing, most of the North American market is supplied from U.S. and Canadian production

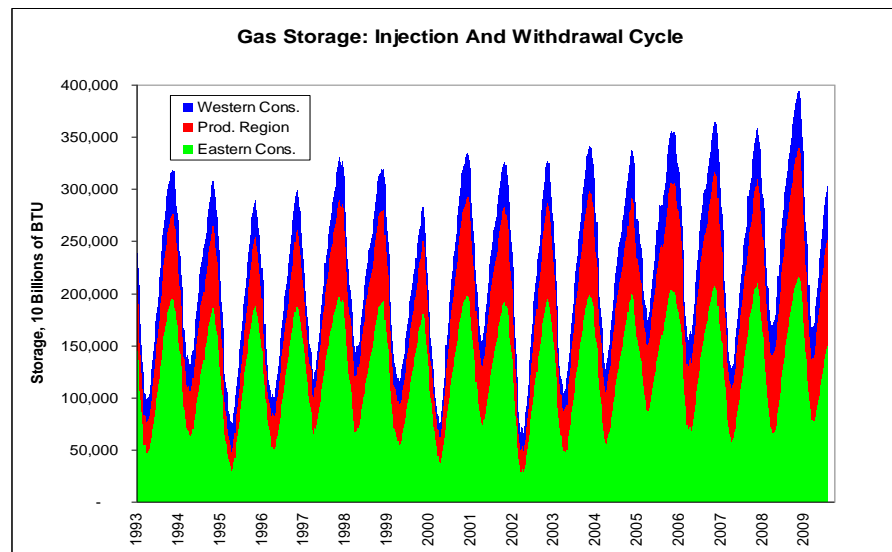
Natural Gas Strips

- The widely reported front-month price of natural gas futures is often separate from the rest of the forward curve (top). That relationship changes every year
- Natural gas buyers – and the price of natural gas-related equities – often focus more on the price of strips of natural gas and their changes (bottom)



The Natural Gas Storage Cycle

- The seasonal nature of natural gas demand leads to a cycle of storage injections in the summer and early fall and withdrawals in the winter and early spring
- Price spikes occur when the drawdowns are largest in the Department of Energy's Eastern Consuming Region (green)



Substitution

- Many large utilities and industrial users invested in dual fuel use boilers
- Common switches occur between natural gas and coal in electrical generation and between natural gas and heating oil in space heating
- The engineering costs of switching are high, and the difficulties involved in storing natural gas at the final demand site have limited the widespread adoption of this strategy

Drivers Of Energy Markets

- Prices increasingly are being set outside of the U.S. as Chinese and other Asian demand is growing far faster than American demand
- Supplies increasingly are controlled by revenue-maximizing state-controlled firms and not profit-maximizing private firms
- The return on ever-greater investments in new supplies is diminishing as exploration gets pushed into frontier areas
- Governments increasingly are demanding internalization of environmental costs

Drivers Of Energy Markets (Cont.)

- Energy demand from all sources rises with economic growth, but the energy efficiency of new plant & equipment always rises
- The rise of long-only commodity investments and commodity-linked funds has given energy markets a trading linkage to financial markets they never had before
- Prices change behavior: The world has learned since the first oil shock in 1973-1974 the price elasticities for both supply and demand become increasingly powerful with time

Tracking Energy Markets

- Both the [American Petroleum Institute](#) and the Department of Energy's [Energy Information Administration](#) release weekly data on inventories and prices
- The API remains a good source of information on refinery data and implied demands
- Lower-frequency global data are available from the [International Energy Agency](#)

Grain, Oilseed & Livestock Markets

People, Livestock, Yeast

- Grains and oilseeds are used to feed people, usually in processed form, livestock, usually with minimal processing and yeast
- Farmers have increased yields and productivity enormously over the centuries
- Agriculture occupies a special place in the American political culture
- Export markets are critical for U.S. farmers
- Increased use of foodstuffs for ethanol and biodiesel production represents one of the fastest demand growth areas

Supply-Driven

- For all of the advances in agricultural productivity, weather remains a primary driver of supply
- A second primary driver of supply is the decision by farmers over how much acreage to devote to one crop against other
- A third primary supply driver is the expansion of agricultural acreage into previously virgin lands
- Various agricultural subsidies, storage carryover from the last growing season and Southern Hemisphere crop conditions affect planting decisions

Food Demand

- Consumers have a great deal of latitude in where they place themselves along the dietary curve
- Higher incomes and/or lower prices translate into higher protein-content demand, subject to cultural constraints
- Demand is not unbounded: There is a limit to how much more you are going to eat or how high up the dietary curve you will move
- While food shortage is a primal fear, one of the great global public health problems today is obesity: People are programmed to eat what is available

Demand (Cont.)

- Demand can be divided into
 - Actual consumption
 - Storage, both actual and speculative
 - Exports
- Export demand is the most variable of these components and more often than not accounts for the marginal bushel
- The global export market is highly competitive and is affected by currency fluctuations as well as various export subsidies

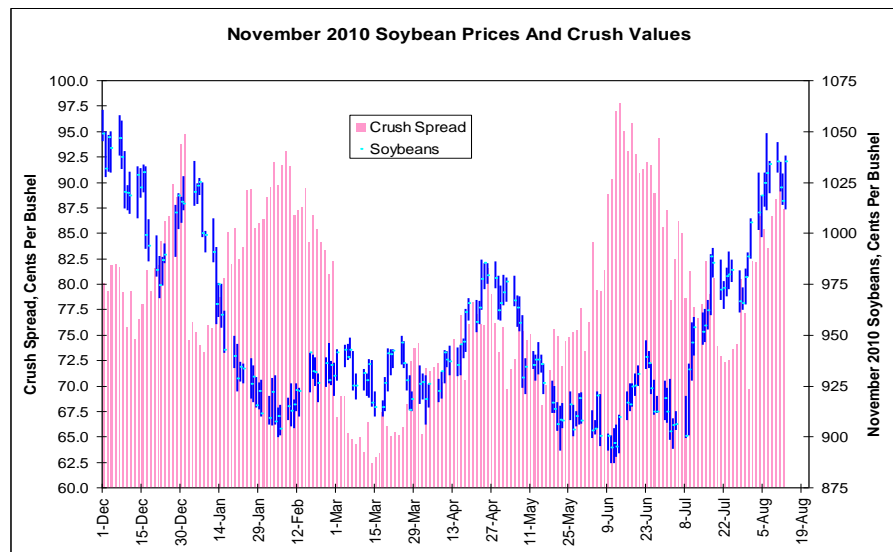
Processing & Derived Demand

- Most grains are purchased in the form of a processed food product, not as a whole food
- Rice and corn are eaten directly in the U.S.
- Soybeans are eaten directly in Asian markets
- Europeans seldom eat corn directly
- Yeast eat corn and sugar directly
- Some fats & oils are eaten directly; most are used in cooking or are embedded within a processed food

Agricultural Spreads & Margins

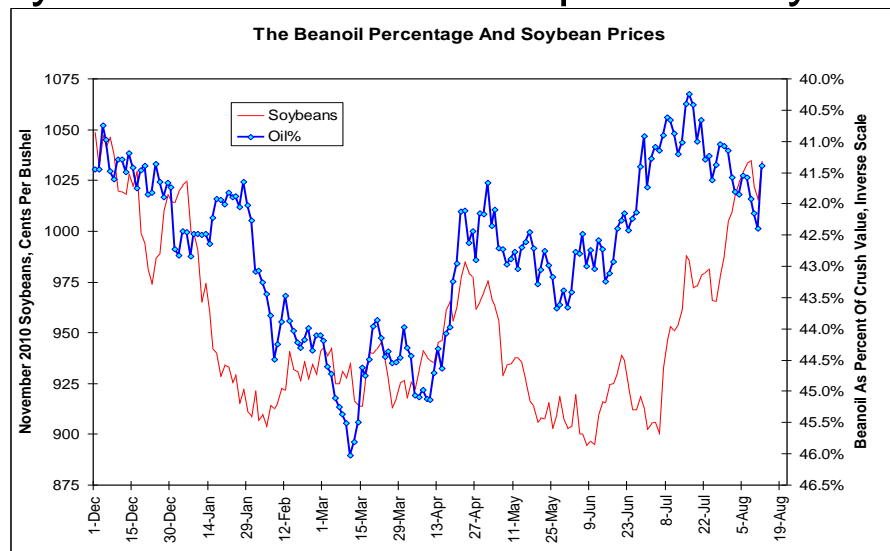
The Soybean Crush Spread

- The standard crush spread is $[2.2 * \text{soymeal}] + [11 * \text{beanoil}] - \text{soybeans}$, expressed in \$/ton, ¢/pound and ¢/bushel, respectively
- A high crush spread can exist with weak soybean prices, particularly if beanoil prices are rising
- While rising soybean prices can exist with a rising crush spread, they often compress crushing margins



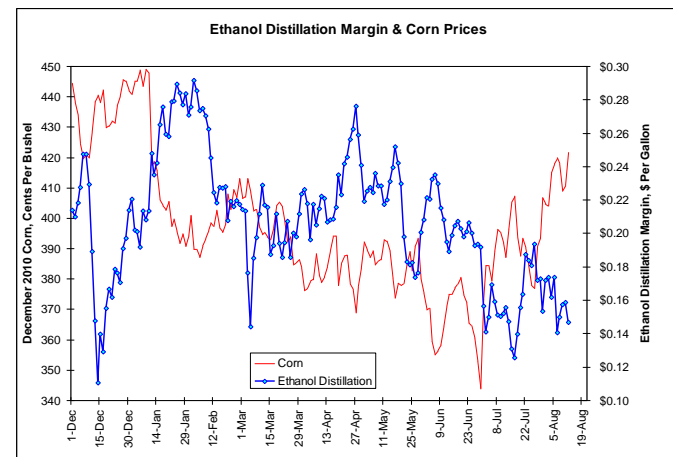
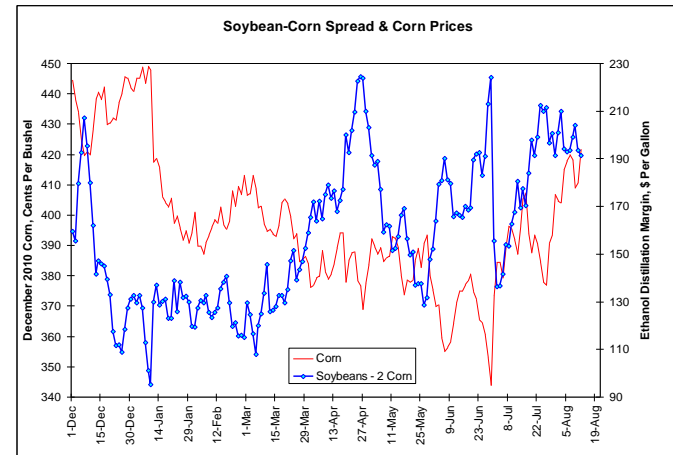
Beanoil As Percent Of Product Value

- Soymeal competes with corn, feed wheat, fishmeal and other high-protein feed additives
- Beanoil competes with other edible vegetable oils such as canola, corn oil and palm oil
- As these are very different final markets for the joint products, they move differently and exert a different pull on soybean prices



Key Corn Spreads

- A rising spread between soybeans and corn (top) tends to pull corn prices higher as corn will be substituted for soymeal
- Higher corn prices tend to depress gross ethanol distillation margins (bottom)



The Livestock & Poultry Cycle

- Higher grain prices, particularly for corn and soymeal, makes livestock feeding more expensive and can actually lead to liquidations
 - This lowers current livestock prices at the expense of higher future livestock prices
- Lower grain prices lead to increased feedings and lower future livestock prices
- Many hog farmers look to the “hog/corn” ratio to assess whether hog herds will expand or be reduced; historically a ratio of 18-20 : 1 led to expansion

The Cattle Crush Spread

- This is a three-market spread across time between live cattle as the output and corn and feeder cattle as the inputs
- The ratio is four corn, five feeder cattle and ten live cattle contracts
- Month combinations have to reflect the time for cattle-on-feed
 - For example, June live cattle are spread against January feeder cattle and March corn

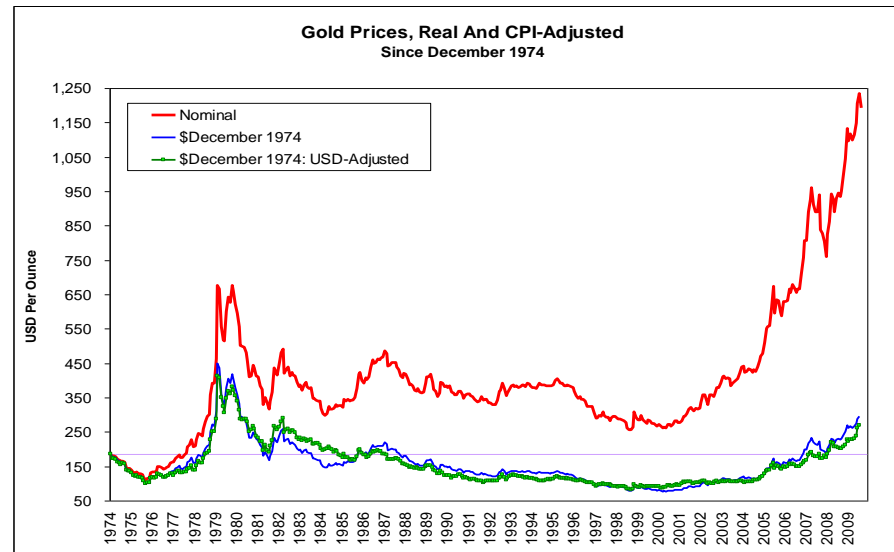
Tracking Agricultural Markets

- The USDA's National Agricultural Statistical Service ([NASS](#)) releases a large amount of data on prices, production and exports
 - The USDA reports as well on livestock indicators such as cattle-on-feed and the breeding of hogs
- The [National Oilseed Processors Association](#) tracks soybean crushes
- The [National Grain and Feed Association](#) tracks the usage of grain in livestock feeding
- Many agriculturally oriented universities have programs such as Kansas State's [International Grain Program](#)

Precious Metals

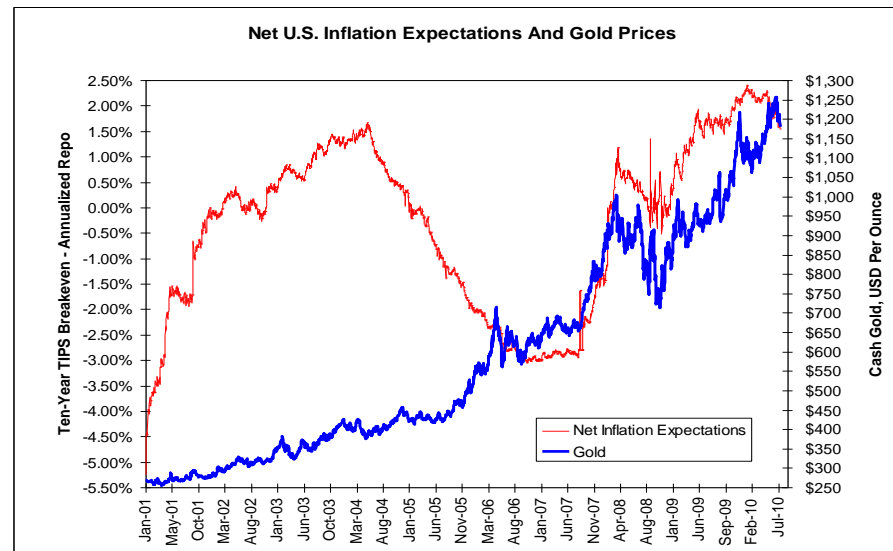
Gold

- Gold has always had a monetary role
- Its final demand is small and it is continuously recycled
- Gold is valued as a store of value and as protection against monetary debasement



Drivers Of Gold Prices

- The principal source of unexpected supply is sales by central banks
- Demand for gold as a store of value is linked to rising wealth levels in India, the Persian Gulf and other markets where it has been a tradition store of value
- The chief financial determinant is the excess of inflation expectations over short-term interest rates



Silver

- Silver is an industrial metal as well as a precious metal
- Much of the world's silver is produced as a by-product of mining either lead & zinc or copper
- Even though gold and silver have different sources and uses, the gold/silver ratio is a common trading measure for silver



Tracking Gold & Silver

- The [World Gold Council](#) and the [Silver Institute](#) both provide a wide range of production and demand data
- The central banks who are members of the Washington Agreement announce their gold sales
- The precious metals used to have a very direct reaction to inflation data; this no longer is the case
- The holdings of precious metals ETFs are an important indicator of marginal demand

Platinum & Palladium

- While these metals are precious in the sense they are rare and can be used in jewelry, they are extraordinarily useful as catalysts
- Their chief sources of demand are from automobile manufacture, petroleum refining and the petrochemical industry
- Exchange-traded funds with physical delivery started for both metals in 2010; neither has disrupted the cash market to-date

Copper

- Copper is vital to construction and electrical equipment
- It is considered a coincident indicator of global economic growth
- Demand at the margin has been established by China's imports, some of which have represented strategic stockpiles, in the past decade
- Copper thus responds immediately and directly to all global data related to industrial production and construction
- The [International Copper Study Group](#) is an excellent source of copper statistics

Summary

- Individual market supply and demand balances determine price trends over the long-term
- News reports and data may shock price in the short-term
- Each market's participants look at fundamental information through the lens of their market but pay attention to related markets especially when there are spreads, margins or intermarket fundamental relationships involved