

COMMODITIES OVERVIEW

Fresno County Employees' Retirement Association

October Retreat

WURTS  ASSOCIATES

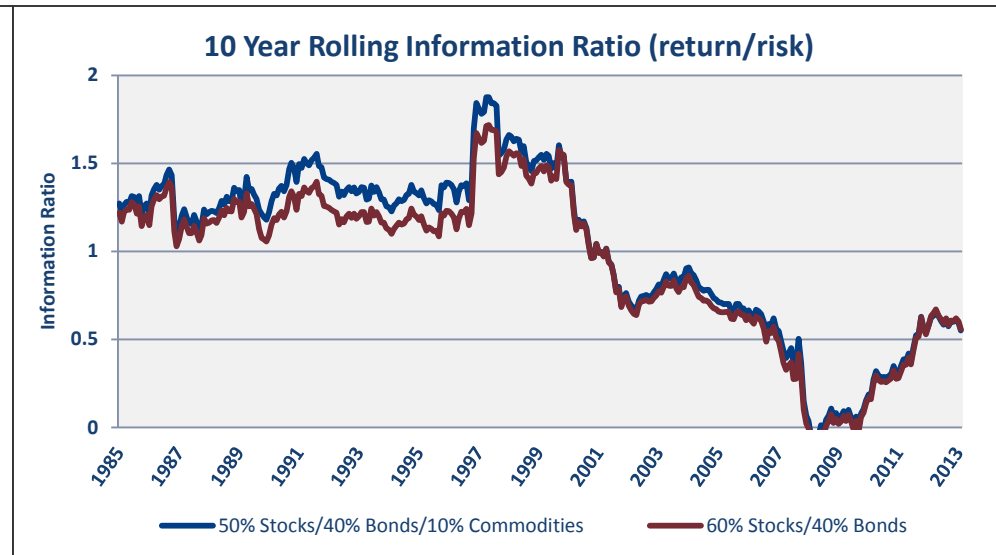
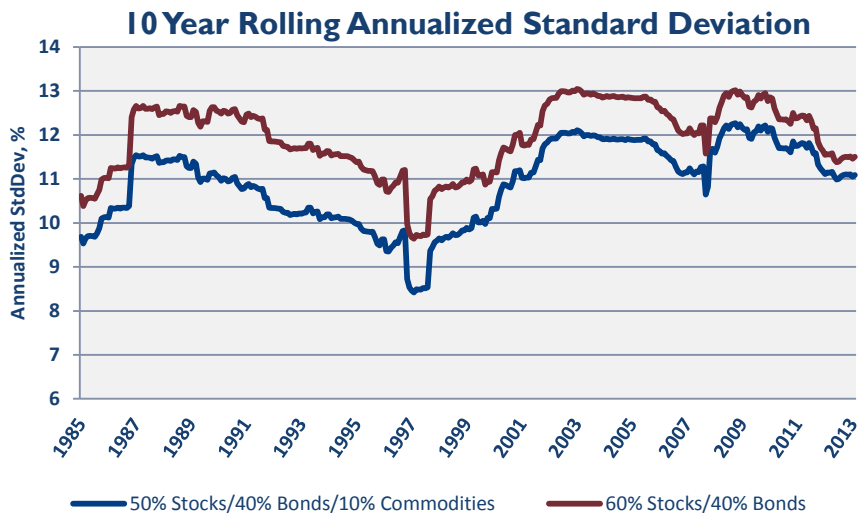
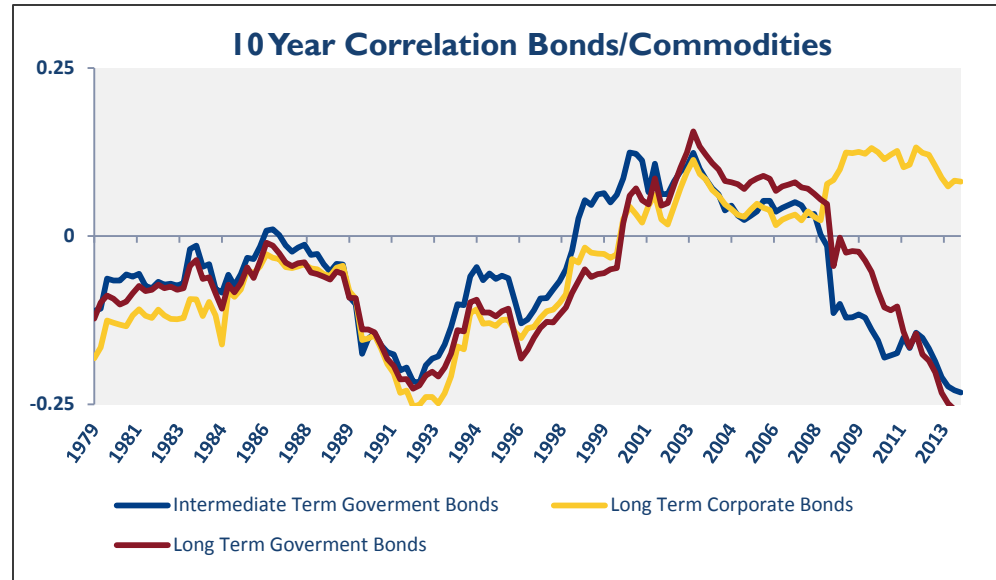
SEATTLE | 206.622.3700
LOS ANGELES | 310.297.1777
www.wurts.com

- Historically low correlation between commodities and financial assets, such as stocks and bonds, means that commodities should help institutional portfolios generate better risk-adjusted returns.
- Commodities tend to perform better than most financial assets during periods of inflation because commodity prices reflect a trend in rising prices of essential goods.
- The major commodities indices have significant drawbacks, most notably negative roll yield, and therefore active management of commodities exposure is preferred over pure indexing.
- This presentation will give an overview of commodities investing. It will highlight the drawbacks of passive indexing and present the case for active commodities investing.
- The appendix includes an active commodities manager comparisons.

COMMODITIES OVERVIEW

WHY INVEST IN THE COMMODITY ASSET CLASS

- The correlation between bonds and commodities has always been low, or sometimes even negative.
- Adding commodities to a standard 60/40 portfolio reduces overall portfolio risk.
- Adding commodities to the same 60/40 portfolio also improves efficiency as measured by the information ratio.



THE ROLES OF ASSET CLASSES

Why do we invest in various asset classes?

What do we practically expect them to contribute to the portfolio over time?

What will determine whether or not they serve the desired role?

	RETURN ROLES				DIVERSIFICATION & VOLATILITY ROLES			HOW MACRO OUTLOOK/ GDP AFFECTS ROLE	
	Benefit from GDP Growth	Earn Risk Premium	Produce Stable Income	Hedge Against Inflation	Low Absolute Volatility	Low Corr. To Other Assets	Reduce Portfolio Volatility	Elements of Return for Asset Class	Sensitivity of Role to GDP
Public Equities	●	◐	◐	◑	○	◐	◐	PE's, Dividends, Earnings Growth	●
Private Equities	●	●	○	○	◐	◑	◑	PE's (exits), Financing, Opportunity Set	◐
Fixed (Treasury)	○	○	●	◐	●	◑	●	Direct Link to Yields	◑
Fixed (Credit)	◐	◐	●	◐	◐	◑	◐	Direct Link to Yields, Credit Spreads	◐
Hedge Funds (Perceived role)	○	◐	○	○	●	●	●	PE's, Credit Spreads, Fat Tails	◑
Real Estate	◐	◑	◐	●	◐	◐	◐	Unemployment, Vacancies, Cap Rates	●
Commodities	◐	◐	○	●	◐	◐	●	Roll Return, Collateral Yield, Price Return	◐

MAGNITUDE ● HIGH ◐ MED. HIGH ◑ MEDIUM ◐ LOW ○ NONE

Differentiated Risk Premium

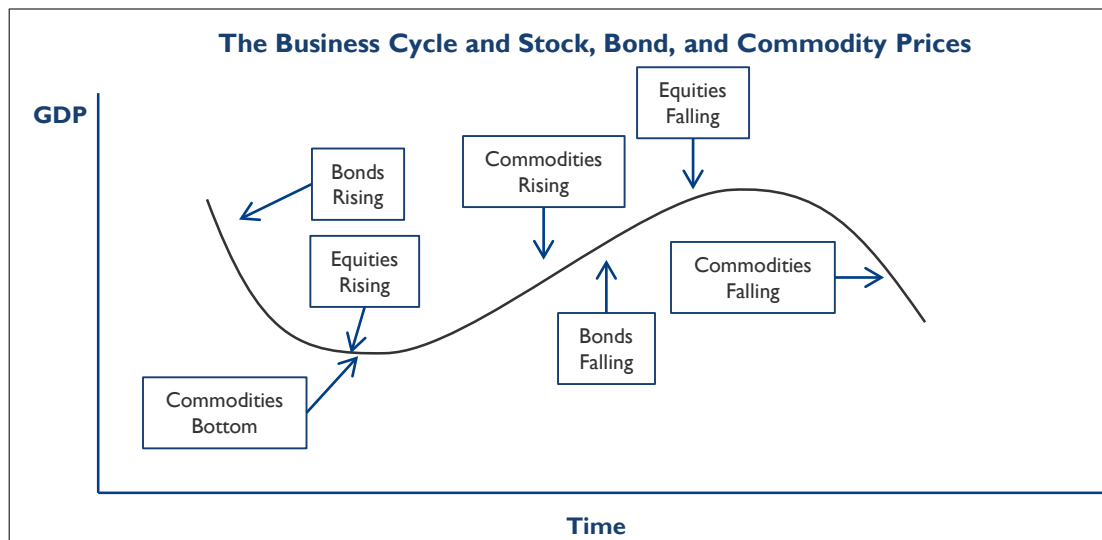
- Speculators earn a distinct risk premium by taking short-term price risk from commodities producers
- Long-term expectations and interest rates have only a minimal impact on commodities returns
- Commodities react different than bonds and equities during the course of the business cycle
- As a result, commodities have significant diversification potential to traditional asset classes

Secular Trends

- Urbanization and economic growth, especially in emerging markets lead to increased commodities demand

Event Risk Protection

- Commodities tend to have positive exposure to event risk (supply disruption)
- Commodities have shown a positive correlation to unexpected inflation



Source: Goldman Sachs

- **Unlike Stocks and Bonds, Commodities:**
 - Do not provide a claim on an ongoing stream of cash flow and cannot be valued on the basis of net present value
 - Have global markets and are less dependent on regional imbalances
 - Adhere even less to the capital asset pricing model

- **Commodities Futures:**
 - A futures contract obligates the seller (buyer) to deliver (purchase) the underlying assets at a set price, date and location
 - To maintain an exposure to commodities, the investor is required to roll the contract: close the position at expiration and initiate a new future position
 - The future contract's price depends on: time to expiration, risk free rate, storage costs, convenience yield, and risk allocation between hedgers and speculators
 - Only a small percentage of the total notional value is required to be posted as collateral for the obligation

- **Sources of Commodities Futures Returns Include:**
 - Changes in commodities spot prices (demand and supply dynamics, macroeconomic policy)
 - Yield generated on the posted collateral
 - Roll yield (carry costs, convenience yield, net hedging)

Contango

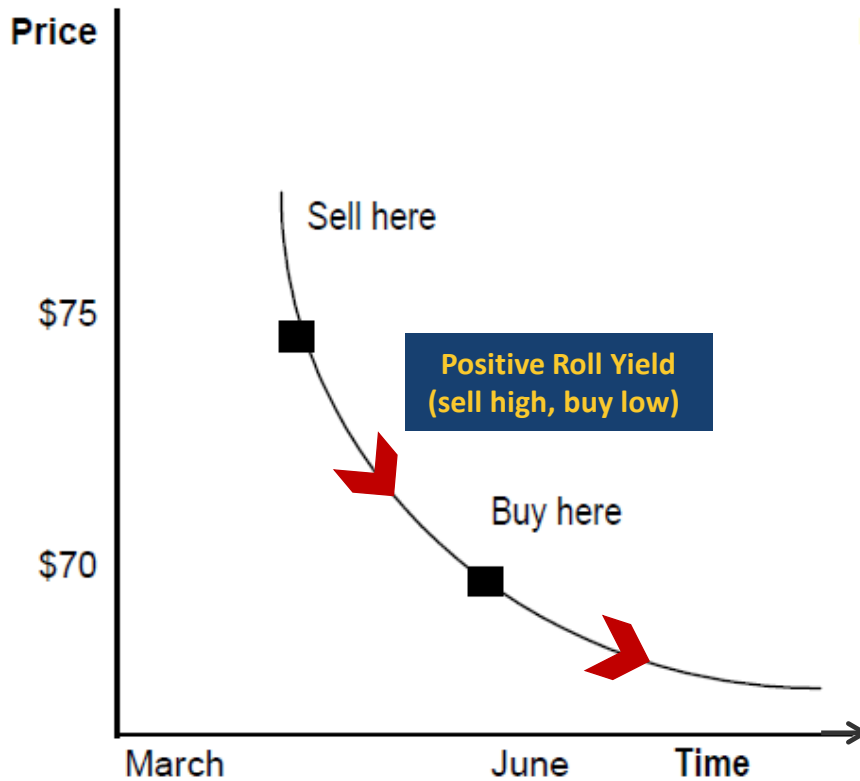
- Indicated by an upward sloping futures curve; the price of a commodity for future delivery is higher than the spot price, or a far future delivery price higher than a nearer future delivery
- A contango is normal for a non-perishable commodity which has a cost of carry. Such costs include warehousing fees and interest forgone on money tied up, less income from leasing out the commodity if possible (e.g. gold).
- The contango should not exceed the cost of carry, because producers and consumers can compare the futures contract price against the spot price plus storage, and choose the better one. Arbitrageurs can sell one and buy the other for a risk-free profit
- May indicate perception of current supply surplus in the commodity

Backwardation

- Opposite of Contango
- Indicated by a downward sloping futures curve; the price of a commodity for future delivery is lower than the spot price, or a far future delivery price lower than a nearer future delivery
- Near prices become higher than far prices because consumers prefer to have the product sooner rather than later, and because there are few holders who can make an arbitrage profit by selling the spot and buying back the future.
- May indicate a perception of a current shortage in the underlying commodity

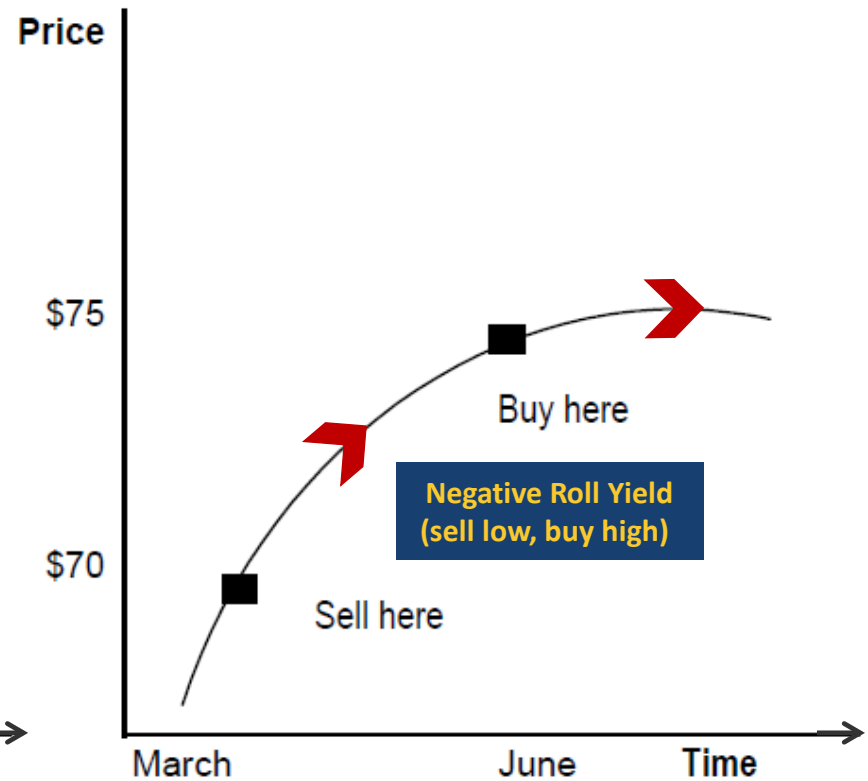
Backwardation:

When the futures curve is in backwardation, the “roll” results in a profit

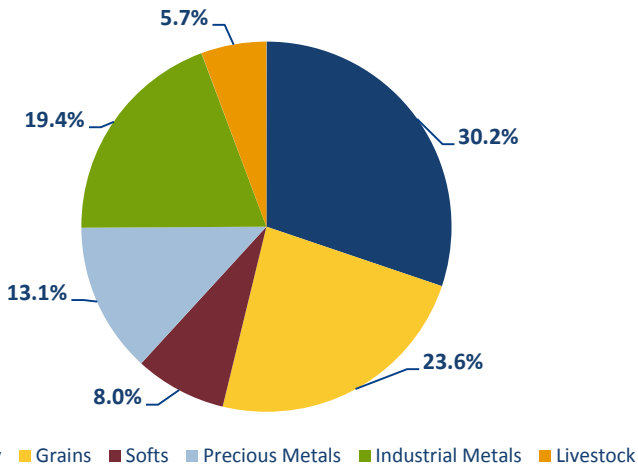


Contango:

When the futures curve is in contango, the “roll” results in a loss



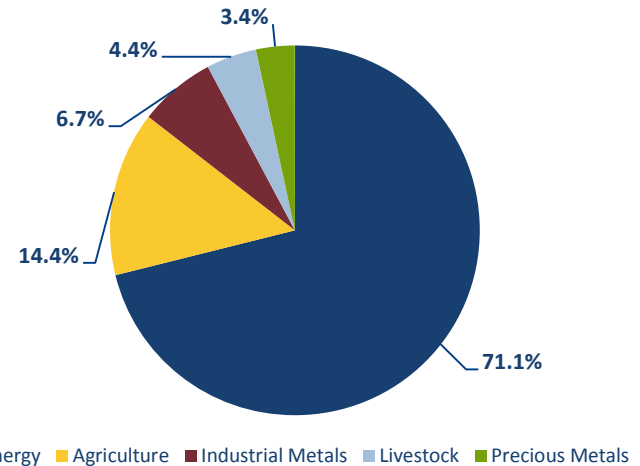
Dow Jones-UBS Commodity Index



Dow Jones-UBS Commodity Index

- Weighted by both liquidity (2/3) and dollar-adjusted historical production (1/3)
- Annual price-percentage rebalancing (no intra-year re-weighting)
- Diversification rules limit exposure to any one commodity (15%) or sector (33%)
- 2% minimum allocation to any commodity

S&P Goldman Sachs Commodity Index



S&P Goldman Sachs Commodity Index

- Production weighted by 5-year historical production amounts
- Annual rebalancing (no intra-year re-weighting)
- No predefined commodity or sector limits
- No minimum allocation to any commodity

Source: Dow Jones, Goldman Sachs. As of March 31, 2012

COMMODITY INDEX CONSTRUCTION METHODOLOGY

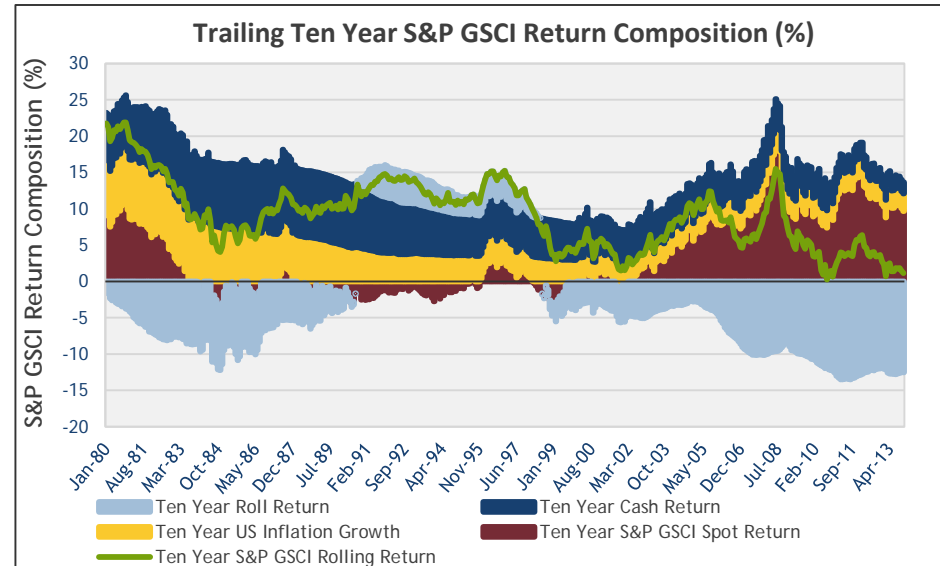
	DJ-UBSCI	S&P GSCI
Inception date (backfilled)	1998 (1991)	1991 (1970)
Constituents	20	24
Selection, weighting criteria	Liquidity, world production	World production
Futures selection	Nearby futures contracts	Nearby futures contracts
Contract country of origin	US, UK	US, UK
Diversification rules	Yes	None
Roll frequency	Varies	Monthly
Roll window	5th-9th US business day	5th-9th US business day
Rebalancing	Yearly	Yearly
Price rebalancing	Yes	No

Source: Goldman Sachs, Dow Jones

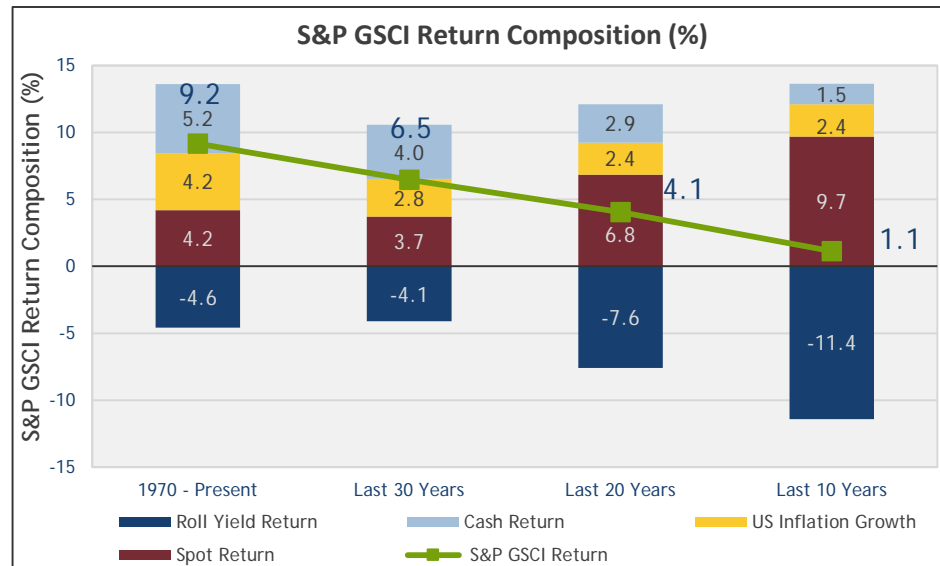
WURTS' CAPITAL MARKET ASSUMPTIONS FOR COMMODITIES

- Commodity returns can be decomposed into four sources: collateral return (cash), inflation, spot changes, and roll yield.
- Roll return represents either the backwardation or contango present in futures markets. Backwardation occurs when the futures price is below the spot price, which results in an additional profit. Contango occurs when the futures price is above the spot price, and this results in a loss to commodity investors. Historically, futures markets fluctuate between backwardation and contango. Although roll return can be a large contribution to commodity returns, they are not considered in our forecast as there is no consistent methodology to forecast roll return. Over the most recent 10-year period, roll return has been negative, contributing -12% to the S&P GSCI total return.
- Our 10-year commodity forecast combines collateral (cash) return with inflation to arrive at the nominal return, and subtracts out inflation to arrive at the real return.

10-Year Forecast	
Collateral Return (Cash)	+2.5%
Roll Return	+0.0%
Inflation	+2.4%
Nominal Return	4.9%
Inflation	-2.4%
Real Return	2.5%



Source: MPI, Wurts' Calculation



Source: MPI, Wurts' Calculation

COMMODITIES INVESTMENT OPTIONS SUMMARY

Structure	Advantages	Disadvantages
Physical Commodities	Purest form of exposure	Costly, Difficult to Implement, Liquidity
Index Fund	Low-cost, ease of investment, transparent	Term Structure
Index Fund + Collateral Management	Ease of investment, can outperform index	Term Structure , Credit Risk, Leverage
Swap	Low-cost	Term Structure, Counterparty Risk, Operational Issues (ISDA)
Structured Products	Flexible, No ISDA required	Liquidity, Counterparty Risk, Term Structure
Commodities ETFs	Ease of investment, transparent	Term Structure, Higher Costs, Limited Options
Commodities Equities	Ease of investments	Market risk, Company Specific Risk
Long biased Managers	Term Structure Mitigation, Commodity Selection	Changes in term structure, underweight energy relative to benchmark
Long/Short Managers	Down-market protection, Commodity Selection	Leverage, Fees, Non-Directional Exposure, Manager's Oversight
Funds of Funds	Access to specialists	Leverage, Fees , Non-Directional Exposure

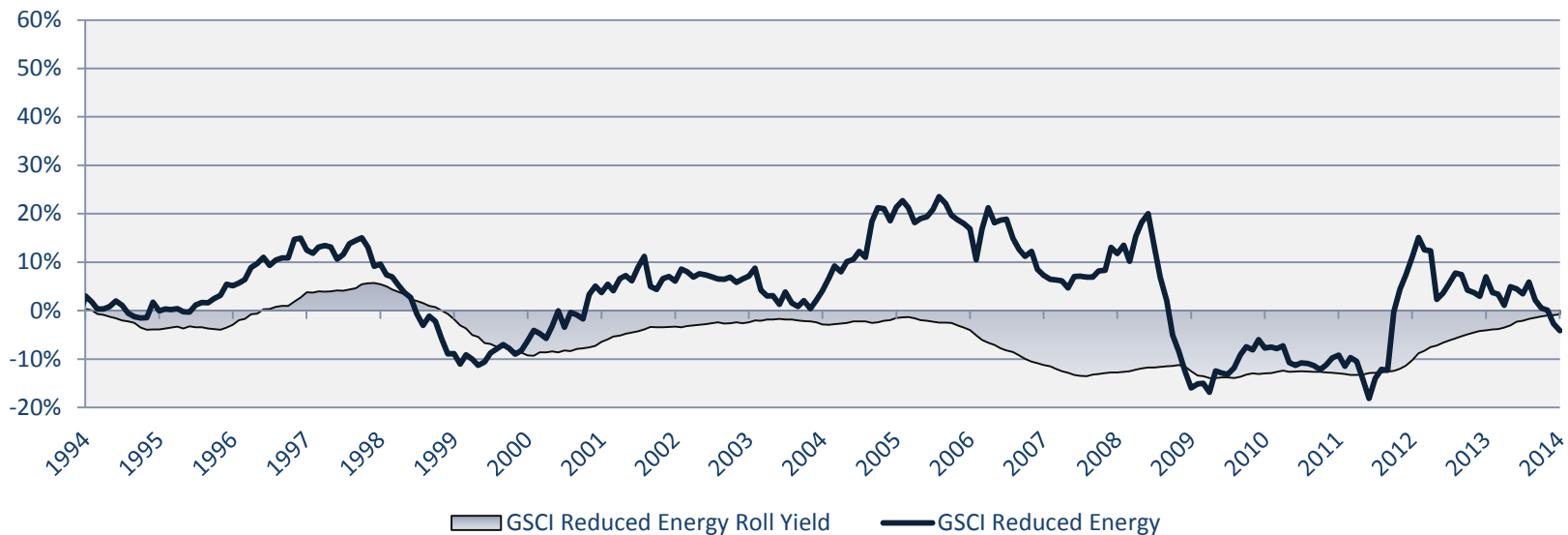
- There are three main drawbacks with passive long-only commodities indexing:
 - Inability to cope with upward sloping future curve that leads to negative roll returns
 - Sector weights without investment rationale
 - Predetermined trading schedule that is exploited by commodities traders
- Applying an active approach to commodities investing can mitigate these drawbacks
- Active long only commodities managers generate excess returns over the benchmark by:
 - Managing roll yield
 - Allocating among sectors based on fundamental investment rationale
 - Generating additional excess returns by relative value spread trades
- Implementing an active approach to commodities investing maintains the underlying investment thesis for commodities indexing
- However, long biased commodities active managers have only become institutional in the last few years and the universe includes only a handful of strategies

INABILITY TO COPE WITH UPWARD SLOPING FUTURES CURVE

Roll Yield Implementation in Long-Only Commodities Indexes Can Cause Losses

- Passive long-only commodities indexes apply a set process of continually rolling over expiring futures contracts. If a commodity futures contract price is above the spot price, a condition defined as “contango,” the subsequent roll yield will be negative
- For example, in 2009, the spot price of crude oil (WTI) appreciated by 78%, but the passive index crude oil allocation gained only 7% return after incurring negative roll yield
- In the last seven years negative roll yield hurt passive commodities index performance

S&P GSCI Reduced Energy* Returns vs. Roll Yield 3 Year Rolling Annualized Return

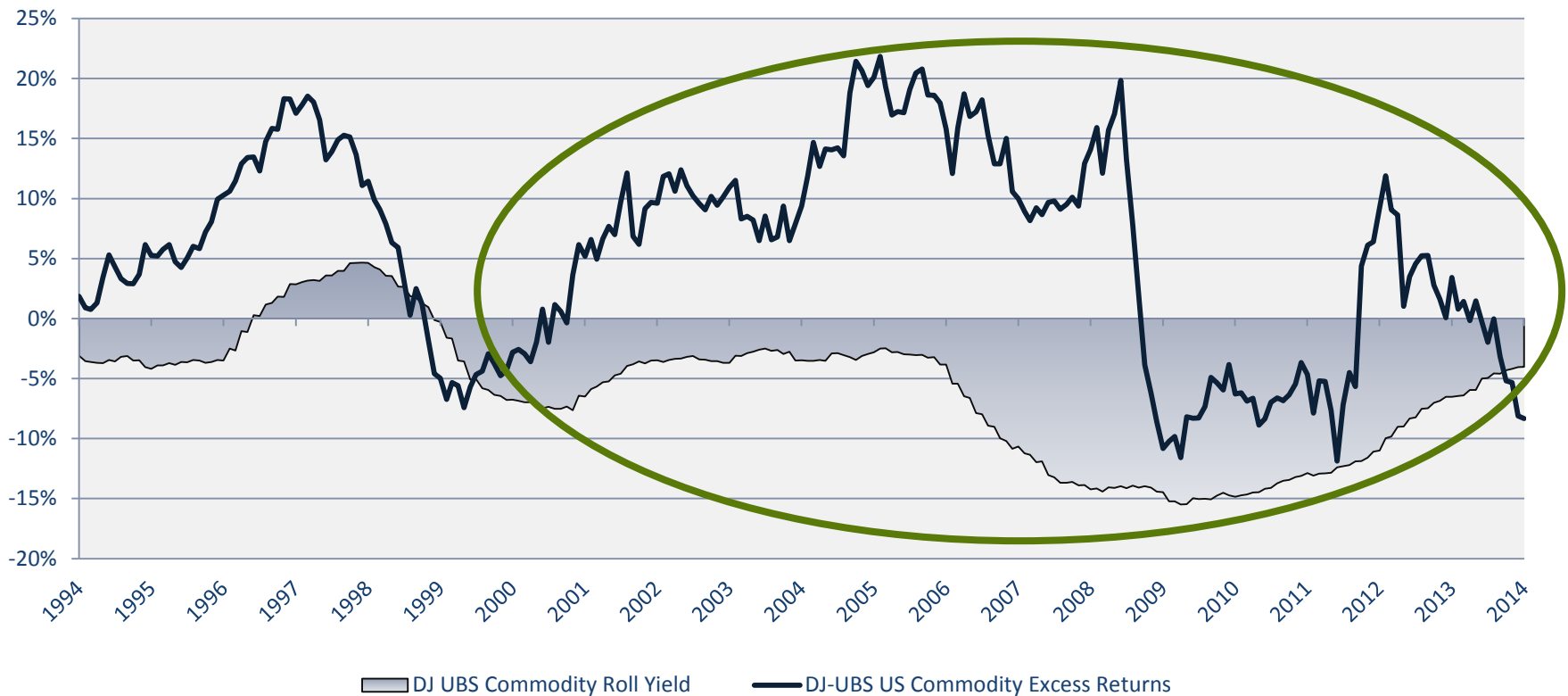


*The S&P GSCI Reduced Energy Index calculation uses 1/2 of the S&P GSCI contract production weights for the energy components

INDEXING PROLIFERATION EFFECT ON ROLL RETURNS

- The wide adoption of commodities indexing in the last ten years as a means to access the asset class may have caused buying pressures on front month contracts, leading to a regime change from backwardation to contango

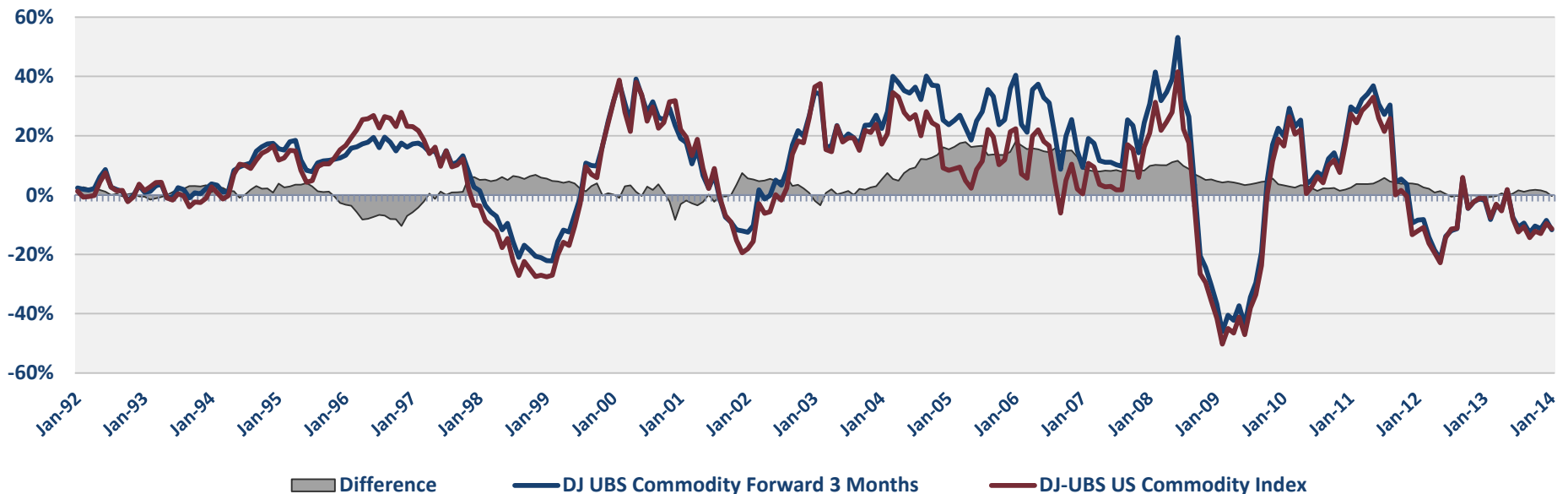
DJ UBS Returns vs. Roll Yield
3 Year Rolling Annualized Return



EXTENDING THE CONTRACT TERM GENERATED EXCESS RETURNS

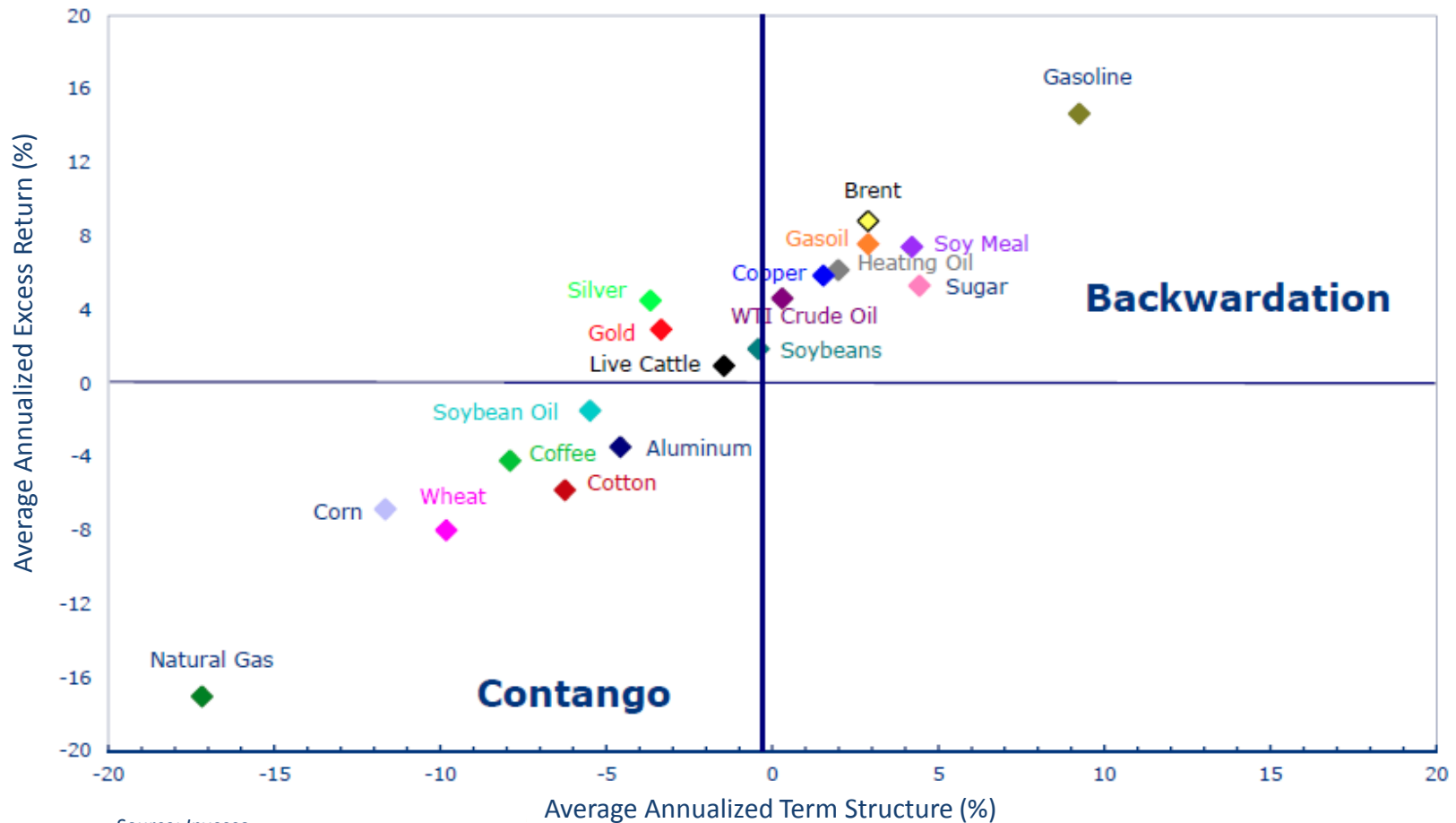
- Active roll yield management attempts to minimize the negative performance associated with rolling futures contracts in an upward sloping futures curve environment
- The chart below demonstrates the positive excess returns generated by simply extending the contract maturity of the DJ-UBS to three months
- The main risk of extending the contract term is underperformance when the futures curve shifts from contango to backwardation due to short term spikes in demand, supply disruption, or shifting expectations of future supply/demand

**DJ-UBS Forward 3 Months Vs. DJ-UBS Total Return
1-year Rolling Return**



SECTOR WEIGHTS WITHOUT INVESTMENT RATIONALE

- Commodity indexes are not constructed based on an academic rationale, similar to the equities indexes
- The DJ-UBS index currently represents 20 commodities, which are weighted to account for economic significance and market liquidity. Unsurprisingly, commodities that have historically tended to be in contango underperformed

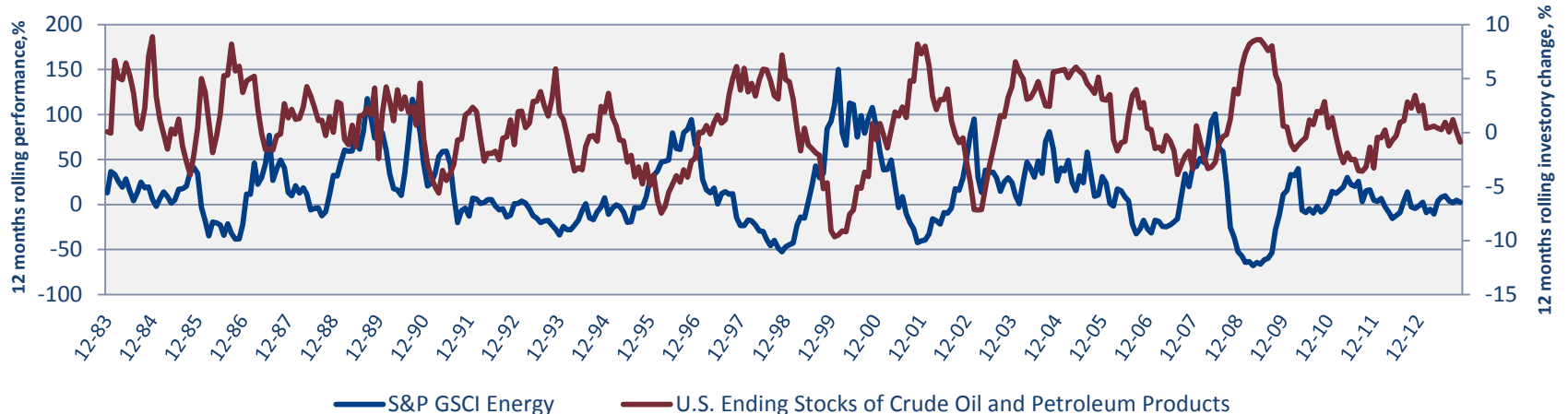


Source: Invesco

ACTIVE SECTOR ALLOCATION

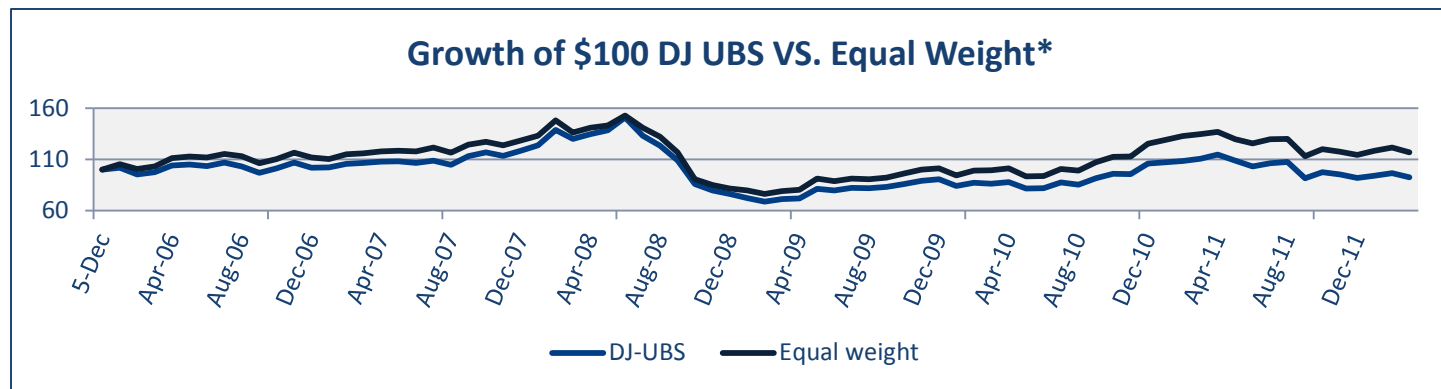
- Active commodities managers can strategically or tactically deviate from benchmark weights by conducting fundamental analysis regarding:
 - Supply and demand trends
 - Economic environment
 - Marginal cost of production
 - Inventories
 - Price trends and reversals
 - Shape of the futures curve

There is a clear negative correlation between oil inventories and oil prices



ADDITIONAL ALPHA SOURCES

- Spread trades:
 - Exploiting relative fundamental dislocations between commodities, capturing producer margins, and benefiting from a predicted shift in the curve structure
- Implementation :
 - Ensuring efficient trading implementation of the portfolio, avoiding trading pressure caused by indexer activity, and benefiting from hedgers activity
- Rebalancing:
 - Constructing the portfolio to maximize rebalancing returns



* Equal weight benchmark of 22 commodities (DJ-UBS constituents) rebalanced monthly, calculated by Wurts and Associates

INFLATION HEDGING

- Long only active commodities managers have similar or better inflation correlation compared to the commodities indexes
- Given zero interest rate on cash as well as continued negative roll yield, spot commodity prices would have to outperform inflation considerably to maintain the index real value
- Active managers can better position the portfolio to cope with various sources of inflation

Manager Name	Correlation to Inflation (Monthly)	Start Date
DJ-UBS	0.23	Feb 91
Invesco	0.27 (0.50)	Oct 08 (simulated since 1977)
Gresham	0.27	Jan 87
Wellington	0.32	Jan 08

Manager Name	Correlation to Inflation (Quarterly)	Start Date
DJ-UBS	0.54	Feb 91
DJ-UBS Forward 2 Months	0.53	Feb 91
DJ-UBS Forward 3 Months	0.55	Feb 91
Gresham	0.57 (0.56)	Feb 91 (Jan 87)

Source: Evestment, Wurts and Associates

Active management of commodities allocation is recommended, because it may:

- **Avoid the drawbacks of commodities indexation**
 - Gain exposure to commodities by employing the full maturity spectrum of futures contracts
 - Contract selection allows the manager to maximize a positive roll yield in the context of a commodity in backwardation or to minimize the negative roll yield of a commodity in contango
- **Provide better diversification benefits and inflation protection characteristics compared to indexation**
 - Adjust sector and commodity selection based on the market environment
 - Allows the manager to express fundamental views on expected changes in the term structure
- **Exploit commodities mispricing**
 - Arbitrage opportunities relying on temporary price divergence between different exchanges, variants, types, or grades available