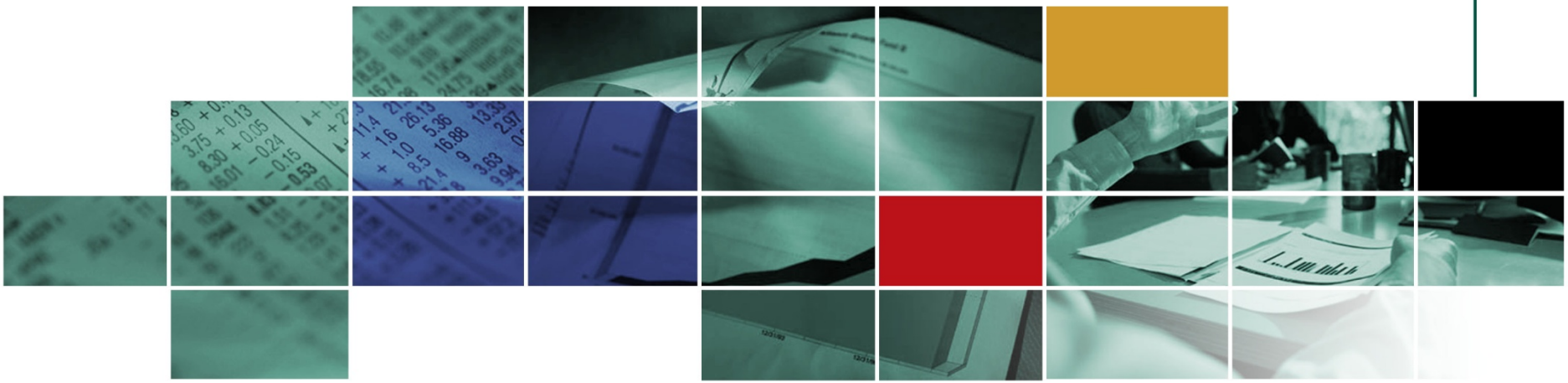
RVKuhns & ASSOCIATES, INC.

Commodities Portfolio Approach

Los Angeles Fire and Police Pension System

February 2012



Summary

- The Board approved a 5% allocation to Commodities, representing approximately $690 million of the $13.75 billion Portfolio.
- The Board asked RVK and LAFPP Staff to provide some specific categories of investment vehicles and approaches for the Commodities allocation.
- Commodity investment vehicles generally fall in to 5 categories – Passive, Enhanced Indexing, Constrained Active, Unconstrained Active and Private strategies.
- Within the liquid commodity strategies, we believe constrained and unconstrained active management provides better risk/return characteristics than passive or enhanced indexing approaches.

Summary

- We believe private strategies can complement liquid strategies in providing additional portfolio diversification and inflation protection.
- Despite the added benefits of private commodity strategies, we believe the commodities allocation should retain heavier weightings to liquid vehicles.
- The potential overlap between private commodities and private equity strategies is significant, and private investments included in the commodities allocation should be asset-based and implemented by skilled asset operators.

Investing in Commodities

What are Commodities?

- Definition: A basic good used in commerce as an input in the production of other goods and services (includes goods such as energy, livestock, grains, and metals, and more).

- Commodities markets are accessed by buying and selling futures contracts of underlying commodities.

- Commodities futures markets require components of unknown supply and demand, creating a need for producers and consumers to hedge their risk; highly predictable supply and demand components do not have futures trading.

Investing in Commodities

What are Commodities?

- Supply and demand is strongly influenced by global growth patterns and consumption, which results in a strong correlation to inflation pressures.
- Additional components for an inflation orientation may include:
  - Inflation linked bonds
  - Currencies
  - Timber
  - Infrastructure
  - Water or mineral rights
  - Private commodities strategies

Investing in Commodities

Basic Commodities Futures Concepts

- Commodity investments are typically made indirectly through derivatives.
  - Most commonly futures contracts, but often over-the-counter swaps as well.

- When the futures contracts are trading below the current market spot price of a commodity, then that market is said to be in “backwardation.”

- When the futures contracts are trading above the current market spot price of a commodity, then that market is said to be in “contango.”

Investing in Commodities

Basic Commodities Futures Concepts

- "Roll Yield" is captured by rolling ownership from one contract date on a futures curve to a contract date further out on the same futures curve.
  - Positive Roll Yield is possible in a backwardated market and is the result of rolling a futures contract with a lower expiration price to that of one with a higher expected expiration price.
  - Negative Roll Yield occurs in a contango market when rolling a futures contract with a higher expiration price to that of one with a lower expected expiration price.

Investing in Commodities

Generating Returns in Commodities

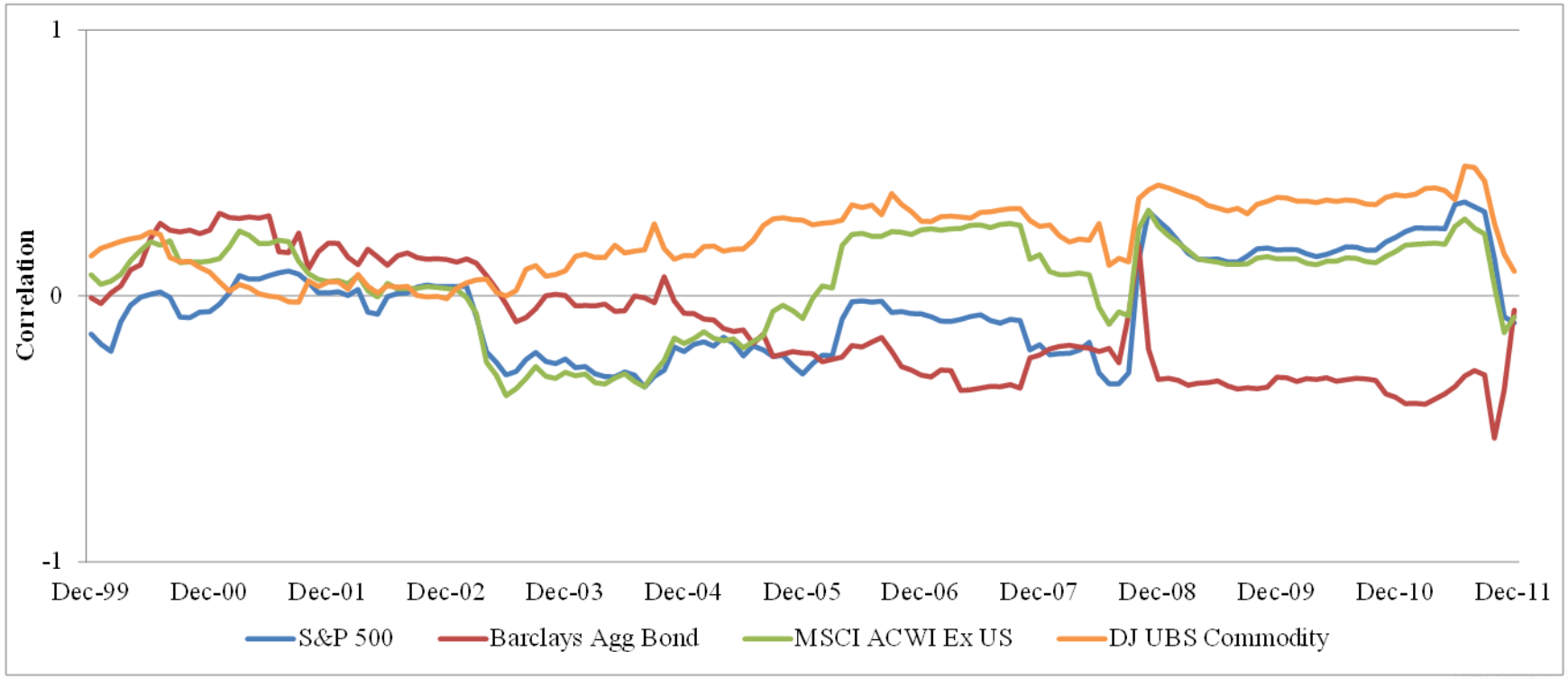
- There are four primary methods by which commodities managers capture available alpha in the asset class:
  - **Collateral management:** Due to margin requirements on futures, commodities investing creates large amounts of excess collateral that can be invested in a wide range of risk-free to highly risky assets.
  - **Tactical allocation:** Managers make tactical bets around specific commodities or sectors they expect to over- or underperform.
  - **Commodity equities:** Buying or selling either specific company equities or larger sector blocks of equities that are highly dependent on commodities pricing.
  - **Roll yield:** Capturing price gains as previously described. This methodology also involves developing trading strategies that capture inefficiencies around index trading rules.

Investing in Commodities

Why is Commodities Exposure a Good Idea?

- Commodities have historically been positively correlated with inflation, while equities and fixed income have been less and sometimes negatively correlated with inflation.

Returns Correlation: 3 Year Rolling (using Seasonally Adjusted U.S. CPI as Benchmark)

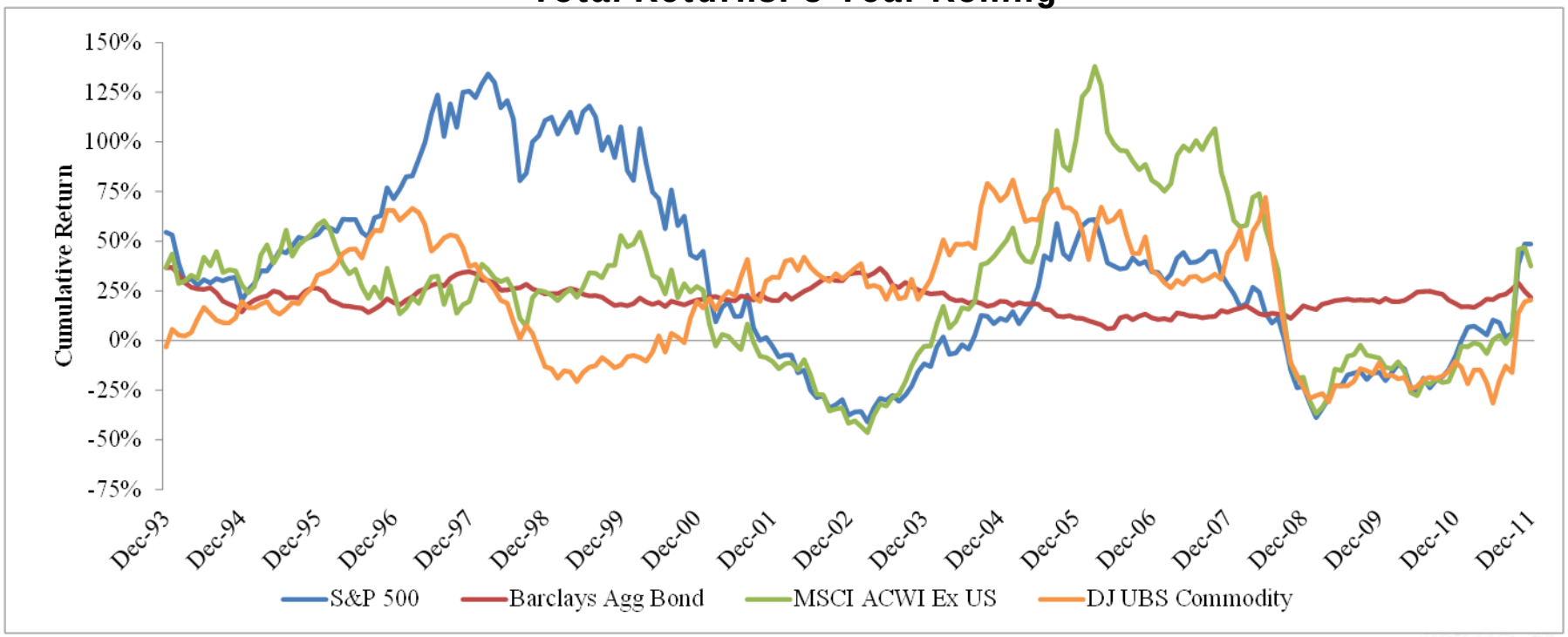


Investing in Commodities

Why is Commodities Exposure a Good Idea?

- Commodities have also historically provided diversification of returns with reduced correlations to equity and fixed income markets.
  - As with all asset classes, correlations have increased in the most recent markets

Total Returns: 3 Year Rolling



Commodities Index Overview

Index Methodology and Implementation

- An index represents a range of investments in exchange traded futures of different physical commodities.
- The prices specified by these futures contracts and the corresponding market spot prices determine the returns of the index.
- Index returns also consider the cash collateral of futures contracts invested at the risk free rate (currently the 90-day US T-bill).

Commodities Index Overview

Index Methodology and Implementation

- Futures contracts are bought and sold for individual commodities based on the policy of each index.

- At expiration, a contract is “rolled forward” to the next appropriate contract, as determined by the individual index’s methodology (the basis for various investment strategies).

Commodities Index Overview

A Wide Variety of Indices

- Four main commodities indices are used to benchmark investment performance and provide underlying beta, or direct commodities exposure:
  - **Dow Jones – UBS Commodity Index (DJ-UBSCI)** was created in 1998 and is the most prominent index utilized by managers.
  - **S&P Goldman Sachs Commodity Index (S&P GSCI)** was created in 1991 and is also widely used. It is diversified across several commodities, but is the most strongly biased towards energy sectors.
  - **Thompson Reuters/Jefferies Commodity Research Bureau Index (TRJ/CRB)** was created in 1957 using 28 commodities, but was renamed and reformulated in 2005 and presently covers 19 commodities.
  - **Rogers International Index** was created in 1990 using 35 commodities across 13 international exchanges; the index currently has increased coverage to 37 commodities.

Commodities Index Overview

Dow Jones – UBS Commodity Index

- The index is comprised of the exchange traded futures for 19 physical commodities.
- The commodities are weighted based on their economic significance using U.S. production data and market liquidity.
- Weighting restrictions are placed on individual commodities in order to provide diversification across the 19 commodities.

Commodities Index Overview

S&P Goldman Sachs Commodities Index

- The index is comprised of the exchange traded futures for 25 physical commodities.
- The index attempts to reflect the relative significance of each commodity on a global economic scale.
- The S&P GSCI is rebalanced annually by first identifying any new commodities to be included.
- After determining the commodities that will make up the index, the weightings for each commodity are decided.

Commodities Index Overview

Thomson Reuters – Jefferies CRB Index

- The index is comprised of the exchange traded futures of 19 physical commodities.
- The index is separated into four groups that each have a specified purpose:
  - Group 1 includes the commodities viewed as the most economically relevant.
  - Group 2 includes the commodities viewed as the most economically significant and highly liquid.
  - Group 3 commodities are equally weighted at a slightly lower level than Group 2 as they are less liquid.
  - Group 4 commodities add to the diversification of the index, but are viewed as less economically significant.

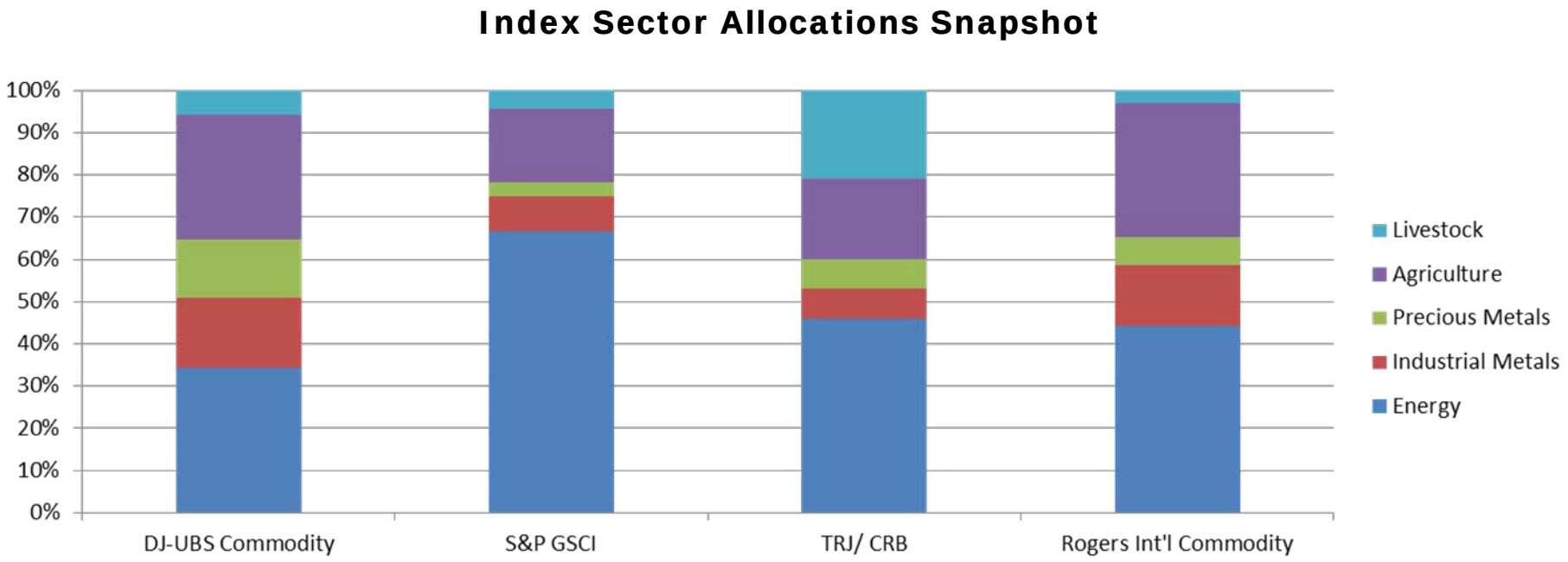
Commodities Index Overview

Rogers International Commodity Index

- The index is comprised of the exchange traded futures of 37 physical commodities listed on 13 international exchanges.
- Commodities are included if they are deemed to have significant role in global production.
  - If a commodity is traded on more than one index, the most liquid contract is chosen based on liquidity as measured by trade volume and open interest.
  - The weight of each commodity is reviewed annually and is determined by the contract liquidity.
- The contracts are usually rolled to the next month's contract on the last business day of each month unless liquidity restraints emerge.
- Weightings are rebalanced on a monthly basis to reset to the initial annual weightings, which are selected each December.

Commodities Index Overview

Index Composition



- As shown in the above chart, due to the different methodologies used by each index, the sector allocations can vary greatly between the four options.
- However, despite these varying methodologies, the energy sector makes up a significant portion of each index.

Commodities Index Overview

Index Comparison

	Advantages	Disadvantages
DJ-UBS	- Largest institutional following - Lower overall energy exposure - Maximum sector weightings to maintain diversification	- Lowest number of commodities in index compared to others - High degree of "ownership" may lead to higher index efficiency
SP-GSCI	- Longest track record of any index - High energy exposure could be more representative of the "real" markets - Accounts for market liquidity	- Energy exposure dominates index, less diversification - Higher level of rebalancing and potential costs, less ability of active managers to add alpha
TRJ/CRB	- Differentiated index weighting methodology - Livestock-dominated, for those investors who specifically target those commodities	- Lowest level of "ownership" out of the four primary indices; few products available - Somewhat subjective allocation process versus the other highly rules-based approaches
Rogers Int'l	- Only index of major four with international and currency exposure - Additional diversification with more commodities than the others	- International and currency exposure add additional volatility - Widely followed by international investors, but not in the U.S. - As with TRJ/CRB, few products available

Commodities Index Overview

Index Performance and Risk Comparison

Risk / Return: 7 & 10 Year Annualized Statistics

Risk/Return: 7 Years	Annualized Return	Annualized Std. Dev.
DJ UBS Commodity	1.58	20.01
S&P GSCI	-1.10	26.38
Reuters/Jefferies CRB	3.42	20.26
Rogers Int'l Commodity	3.97	21.99

Risk/Return: 10 Years	Annualized Return	Annualized Std. Dev.
DJ UBS Commodity	6.63	18.29
S&P GSCI	5.64	25.17
Reuters/Jefferies CRB	9.51	18.58
Rogers Int'l Commodity	10.88	20.07

- The Risk/Return tables above show the wide range of results available depending on which index is used.
- As the volatility of each index increases, the returns also increase, except for the S&P GSCI which is the most volatile and significantly lags in performance.

Investing in Commodities

Primary Approaches to Commodities Investing

- **Passive Investment**
  - A passive index portfolio constructed of rolling futures contracts that attempts to track the allocations of a specified index and capture market beta.

- **Enhanced Index Approach**
  - An enhanced index portfolio, which primarily uses roll yield methodologies to capture inefficiencies of the passive index trading methodologies.

Investing in Commodities

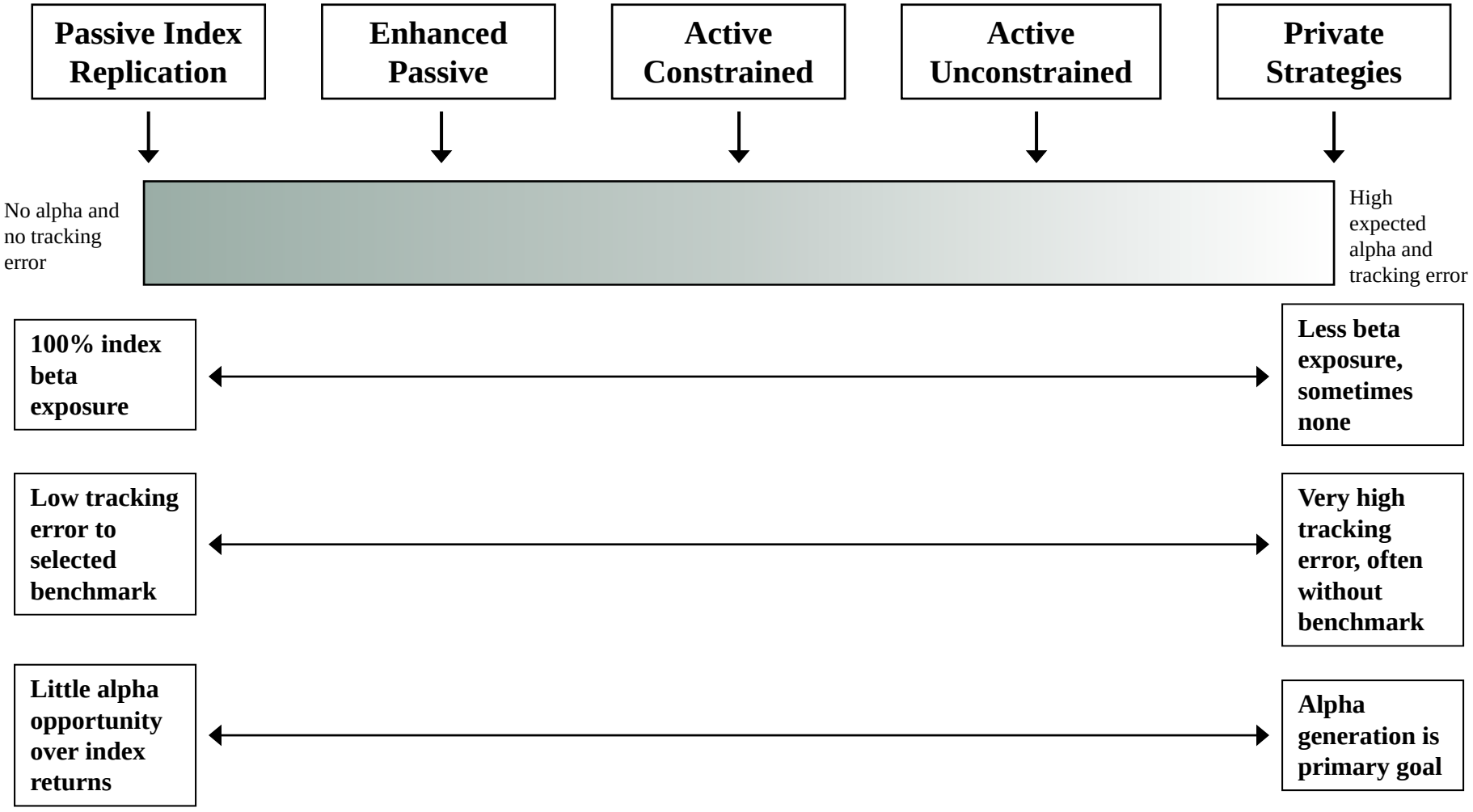
Primary Approaches to Commodities Investing

- **Active Constrained**
  - Designed to generate additional alpha above passive/enhanced index-replication approaches while generally providing exposure consistent with the benchmark index.

- **Active Unconstrained**
  - Designed to generate alpha in commodities without regard for tracking error or market beta exposure.

- **Private Strategies**
  - Private equity-like investments that capitalize on the operational expertise of managers pursuing commodities strategies.

Continuum of Investment Approaches



Choosing a Commodities Investment Approach

Passive Index Approach

- This is the oldest type of commodities exposure, which can be used to access the beta of the commodities market.
- A manager will attempt to replicate the allocations and future contract holdings of the specified index.
- Low tracking error, a beta close to 1, and low fees are the characteristics of this type of strategy.
- Appropriate for tracking error-averse or fee sensitive clients.

Choosing a Commodities Investment Approach

Enhanced Index Approach

- The Enhanced Index Approach hinges on a manager's ability to forecast the futures prices and take advantage of index rolling inefficiencies.

- Buying futures at opportune points on the futures curves enables the manager to generate excess returns if they can create more positive roll yield than the index.

- Managers who attempt to generate positive roll yield in this fashion may also offer to invest the collateral cash used for the futures contracts in short-term debt or treasury securities.
  - This collateral management can be used to generate returns above the risk-free rate.

Choosing a Commodities Investment Approach

Active Constrained Approach

- Constrained active managers will generally be benchmark aware, but will utilize alpha-generating strategies while also providing market beta.

- Alpha-generating strategies may include:
  - Buying futures further out on the futures curve – increasing duration.
  - Tactically allocating their portfolios by overweighting (or underweighting) certain sectors in the benchmark that they believe will outperform (or underperform) over various time periods.
  - Adding exposure to targeted commodities equities.

Choosing a Commodities Investment Approach

Active Unconstrained Approach

- Unconstrained active managers may utilize similar strategies as constrained active managers, but typically without any regard for capturing index beta.

- These strategies may include:
  - Commodities-oriented direct hedge funds
  - Long/short or concentrated public commodities strategies
  - Commodities fund of funds
  - Commodity Trading Advisors (CTA's)
  - Commodity Master Limited Partnerships (MLP's)

Choosing a Commodities Investment Approach

Private Strategies Approach

- Private managers do not trade in public securities or liquid futures contracts, but invest directly in the extraction, production or distribution of commodities.

- The returns generated in this space are less reliant on the underlying commodity price exposure and more reliant on the operational expertise of the management team.

- These investments are typically made through limited partnerships with extensive lock-up periods and return patterns that are similar to private equity.

Choosing a Commodities Investment Approach

Private Strategies Approach

- The potential overlap between private commodity strategies and private equity strategies is significant, and investments considered for the commodities allocation should have the following characteristics:
  - Strategy should be asset based with direct price exposure to the commodity.
  - Strategy should be implemented by skilled operators in the specific commodity category, rather than be part of a broad "energy" fund that may allocate capital across the energy supply chain.

Choosing a Commodities Investment Approach

Private Strategies Approach

- Private strategies that may be considered include:
  - Oil & Gas extraction and production
  - Minerals & Mining extraction and production
  - Agriculture/farmland – predominantly row and permanent crops
  - Timber
  - Private MLPs

Choosing a Commodities Investment Approach

A Case for Active Commodities Management

- Performance data indicates that different types of active commodities management has shown the ability to add alpha without meaningfully increasing the risk of a portfolio.
- Risk/return data indicates that managers with lower tracking errors have historically underperformed the benchmark.
- Managers with higher tracking errors have shown a clear ability to outperform indices with lower volatility.
- Additional alpha generation may be possible with minimal additional risk.

Choosing a Commodities Investment Approach

Performance and Risk Comparison

Risk / Return: 3 & 5 Year Annualized Statistics

Risk/Return: 3 Years	Annualized Return	Annualized Std. Dev.
Commodity Managers < 3 TE	7.62	19.26
Commodity Managers 3-5 TE	10.22	18.50
Commodity Managers 5+ TE	11.11	17.01
DJ UBS Commodity	6.39	18.37

Risk/Return: 5 Years	Annualized Return	Annualized Std. Dev.
Commodity Managers < 3 TE	-0.88	23.06
Commodity Managers 3-5 TE	0.42	22.81
Commodity Managers 5+ TE	2.74	21.38
DJ UBS Commodity	-2.07	21.62

- Although one would expect the portfolios that result in the highest tracking error to the DJ-UBS Commodity Index to be the most volatile, the above tables show high tracking error portfolios to be the least risky and most rewarding.
- These results cannot be expected from every manager that uses a similar strategy, however it does show that most managers have outperformed using a less constrained process.

Choosing a Commodities Investment Approach

Performance and Risk Comparison

Risk Adjusted Analysis: 3 & 5 Year Annualized Statistics
(using DJ-UBS Commodity Index as benchmark)

Risk Adjusted Analysis: 3 Year	Information Ratio	Sharpe Ratio	Beta
Commodity Managers < 3 TE	0.53	0.47	1.04
Commodity Managers 3-5 TE	1.98	0.61	1.00
Commodity Managers 5+ TE	0.98	0.70	0.89
DJ UBS Commodity	-	0.42	1.00

Risk Adjusted Analysis: 5 Year	Information Ratio	Sharpe Ratio	Beta
Commodity Managers < 3 TE	0.35	0.02	1.06
Commodity Managers 3-5 TE	0.80	0.07	1.05
Commodity Managers 5+ TE	1.04	0.17	0.97
DJ UBS Commodity	-	-0.05	1.00

- Higher tracking error strategies deliver higher risk adjusted returns while still providing commodity market beta exposure.
- Deviating from the index allocations allows a manager to use their own forecasts to take advantage of market inefficiencies.
- A skilled manager can create a portfolio with higher alpha generation and similar risk and volatility to the index.

Choosing a Commodities Investment Approach

Performance and Risk Comparison

Annualized Total Return Periods

Annualized Performance	QTD	YTD	1 Year	3 Years	5 Years
Commodity Managers < 3 TE	0.9	-10.3	-10.3	7.6	-0.9
Commodity Managers 3-5 TE	2.4	-8.8	-8.8	10.2	0.4
Commodity Managers 5+ TE	1.1	-10.5	-10.5	11.1	2.7
DJ UBS Commodity	0.3	-13.3	-13.3	6.4	-2.1

- Above are representative groups of commodities managers in three different perceived risk targets.
- The annualized returns change depending on the level of complexity and risk introduced.
- Each strategy outperformed the benchmark on a gross of fees basis with managers exhibiting tracking errors above 3 generally outpacing lower tracking error managers.

Choosing a Commodities Investment Approach

Performance and Risk Comparison

Returns Correlations: 10 Year Annualized

Correlation: Jan 2002 - Dec 2011	Commodity Managers <3 TE	Commodity Managers 3-5 TE	Commodity Managers 5+ TE	DJ UBS Commodity	S&P 500	Barclays Agg. Bond	MSCI ACWI ex-US	U.S. Consumer Price Index
Commodity Managers <3 TE	1.00	0.98	0.94	0.96	0.34	0.03	0.51	0.35
Commodity Managers 3-5 TE	0.98	1.00	0.97	0.98	0.42	0.03	0.58	0.35
Commodity Managers 5+ TE	0.94	0.97	1.00	0.96	0.41	0.09	0.59	0.32
DJ UBS Commodity	0.96	0.98	0.96	1.00	0.41	0.05	0.57	0.31
S&P 500	0.34	0.42	0.41	0.41	1.00	-0.06	0.90	0.06
Barclays Agg. Bond	0.03	0.03	0.09	0.05	-0.06	1.00	0.04	-0.22
MSCI ACWI ex-US	0.51	0.58	0.59	0.57	0.90	0.04	1.00	0.11
U.S. Consumer Price Index	0.35	0.35	0.32	0.31	0.06	-0.22	0.11	1.00

- The correlations for all of the tracking error groupings is very high with the DJ-UBS Commodity Index.
- Each type of grouping provides a hedge against inflation and returns that are relatively uncorrelated with equities and fixed income.