The Case Against The Long-Only Commodity Index

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Implementing Commodities / Currencies
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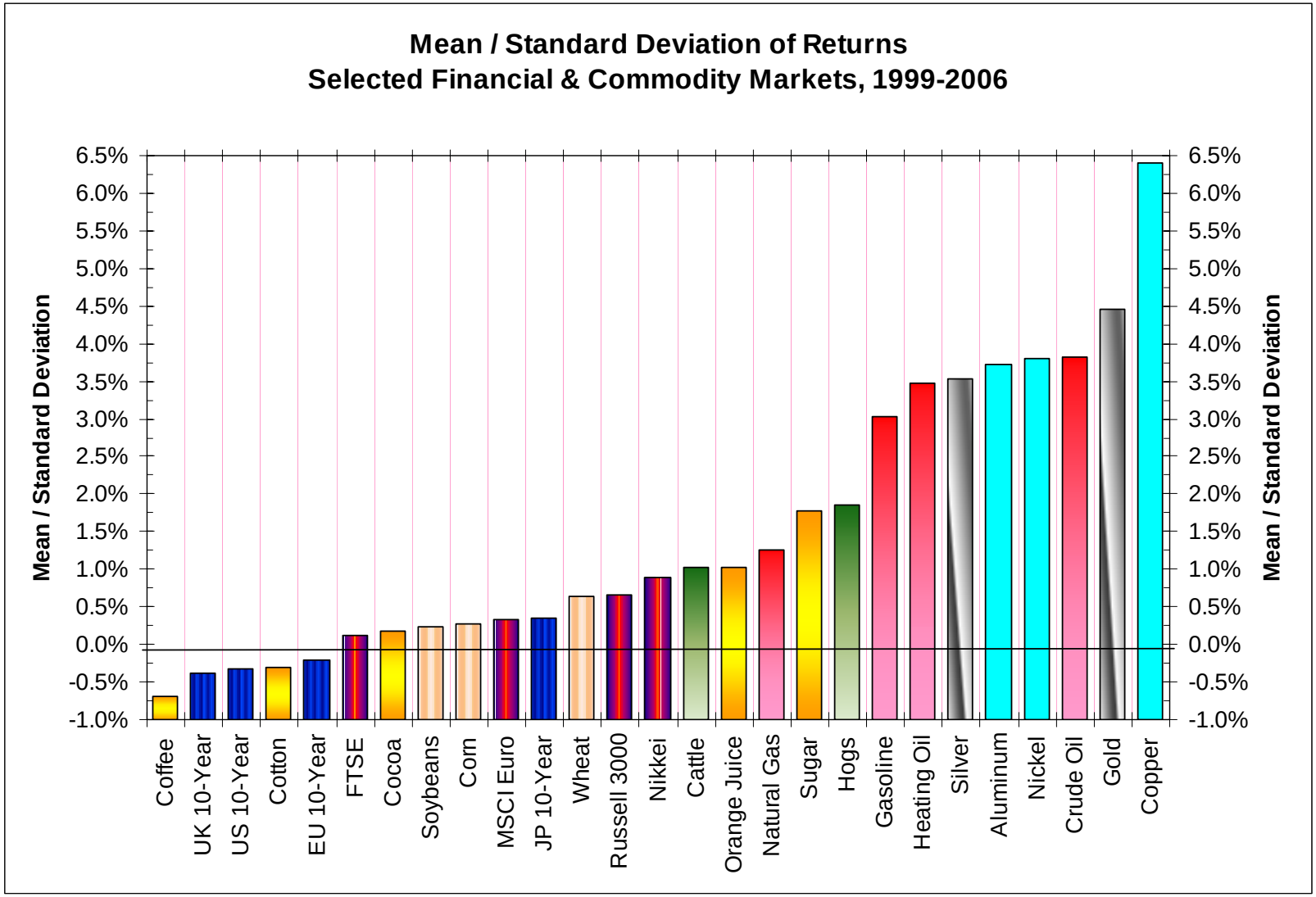
Introductory Points

- A better title for this presentation might be
  - "Moving Beyond The Obvious In Commodities: What The Sales People Forgot To Mention"
- Let's stipulate there are values to be added for institutions in commodities
- We need to understand in a forward-looking manner whether these values are intrinsic to this as an asset class. Understanding the pitfalls today will produce big savings in management stress tomorrow. Preparation is more pleasant than explanation

Daily Correlation of Returns : CRB Components & Senior Financial Markets Since Advent of Euro

	USD10	EUR10	JPY10	GBP10	R-3000	MSER	Nikkei	FTSE
Aluminum	-0.044	-0.067	-0.010	-0.060	0.121	0.147	0.109	0.132
Nickel	-0.032	-0.056	-0.024	-0.035	0.064	0.109	0.070	0.089
Silver	0.062	0.048	-0.028	0.052	-0.028	-0.022	0.075	0.009
Orange Juice	0.014	0.055	0.010	0.030	0.030	0.001	0.013	-0.001
Coffee	0.026	0.016	-0.007	0.007	0.047	0.012	0.020	0.004
Copper	-0.017	-0.078	-0.018	-0.074	0.127	0.167	0.124	0.158
Gold	0.127	0.148	-0.005	0.139	-0.101	-0.115	0.079	-0.081
Crude Oil	-0.025	0.032	-0.028	0.054	-0.014	0.002	0.035	0.005
Natural Gas	0.008	0.032	0.027	0.043	-0.006	-0.028	-0.048	-0.015
Gasoline	0.016	0.031	-0.020	0.046	0.017	0.018	0.034	0.024
Cattle	-0.051	-0.006	0.010	-0.005	0.040	0.061	-0.031	0.041
Hogs	-0.051	-0.035	0.027	-0.038	0.033	0.082	0.017	0.095
Corn	-0.022	-0.035	0.012	-0.022	0.006	0.009	-0.002	-0.007
Soybeans	-0.039	-0.032	-0.004	-0.039	0.021	0.026	0.025	0.002
Wheat	-0.020	-0.003	0.018	0.014	0.018	0.039	0.030	0.007
Heating Oil	-0.014	0.009	-0.013	0.022	-0.021	-0.022	0.017	-0.005
Cotton	-0.066	-0.021	-0.001	-0.029	0.023	0.048	0.012	0.032
Sugar	0.003	-0.002	-0.015	0.011	-0.005	-0.010	0.049	-0.004
Cocoa	0.012	0.052	0.005	0.043	-0.020	-0.043	-0.017	-0.054

Commodities' And Financials' Risk-Adjusted Price Returns



Key Topics

- Six years ago, this topic would have been uninteresting for all involved, and yet it is now *de rigueur* for institutional investors
  - The post-2001 bull market is the most obvious reason for commodities' sudden respectability
  - A low-return environment in both stocks and bonds intersecting with developed world demographics and pension demands has pushed investors out along the risk curve
- Flows follow performance. "Buy low, sell high" is a noble sentiment well-expressed
- Diversification alone never closed a sale

Considerations For Institutions

- Those seeking inflation protection or currency hedging by adding commodities to their portfolios should question their assumptions
- Thirty years after Burton Malkiel, everyone is an indexer
  - As we shall see, the collective entity called “commodities” may not be appropriate for indexation
- The orthodoxy for investors is long-only
  - This is inappropriate for commodities in general and commodity futures in particular
- While conventional financial assets have identifiable sources of returns, the principal returns in the now-accepted long-only index fund are not intrinsic to the instruments involved

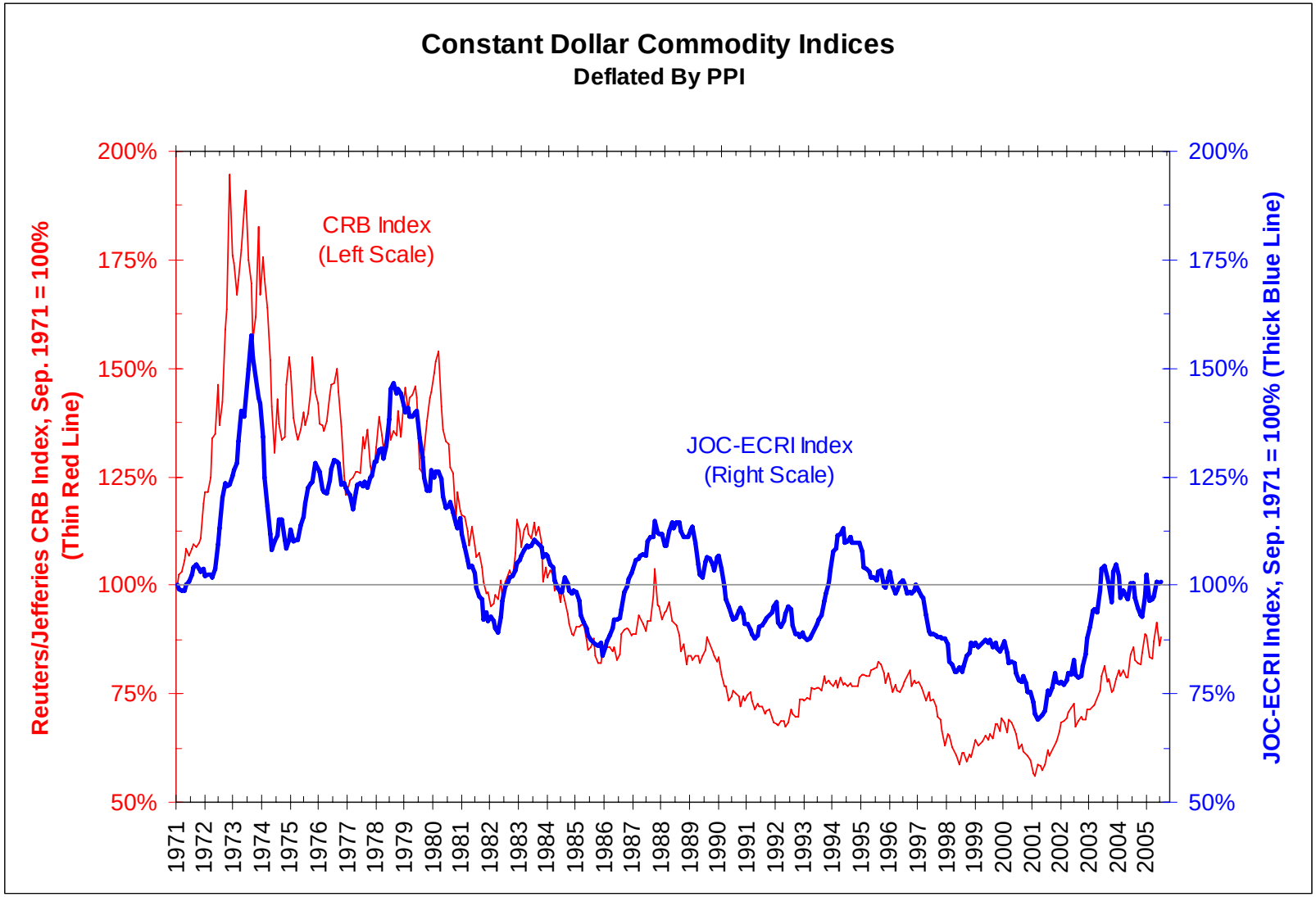
Section I:

Commodities, Inflation And Currencies

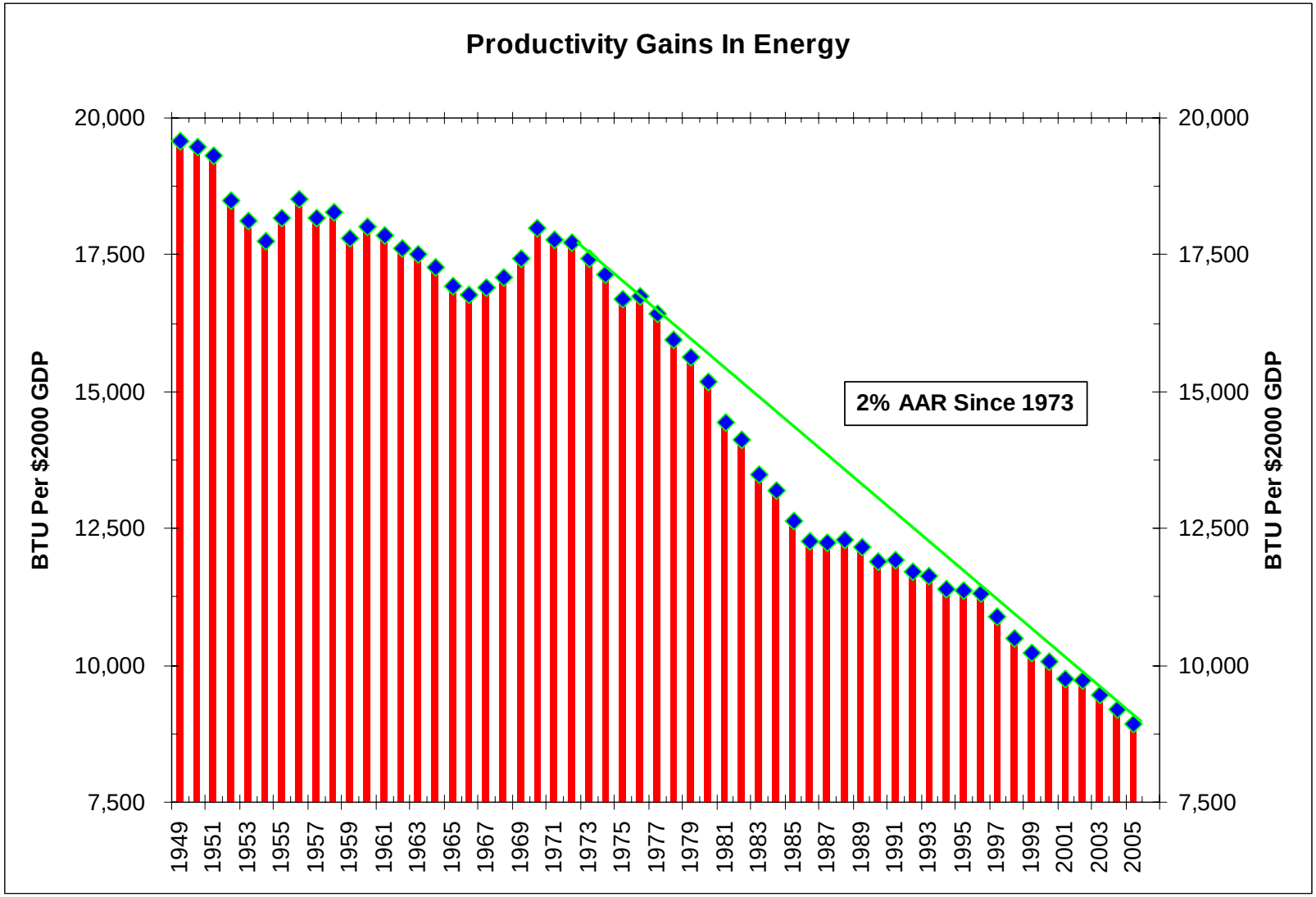
Commodities & Inflation

- Do commodity prices provide protection against inflation? Hardly: Even after four years of rising commodity prices, neither the JOC-ECRI nor the Reuters/Jefferies CRB indices have shown any material gain after being deflated by the PPI
- Rising productivity accounts for this
- Only certain commodities have positive constant-dollar price trends over time
- The more negative the constant-dollar trend, the more statistically significant it is

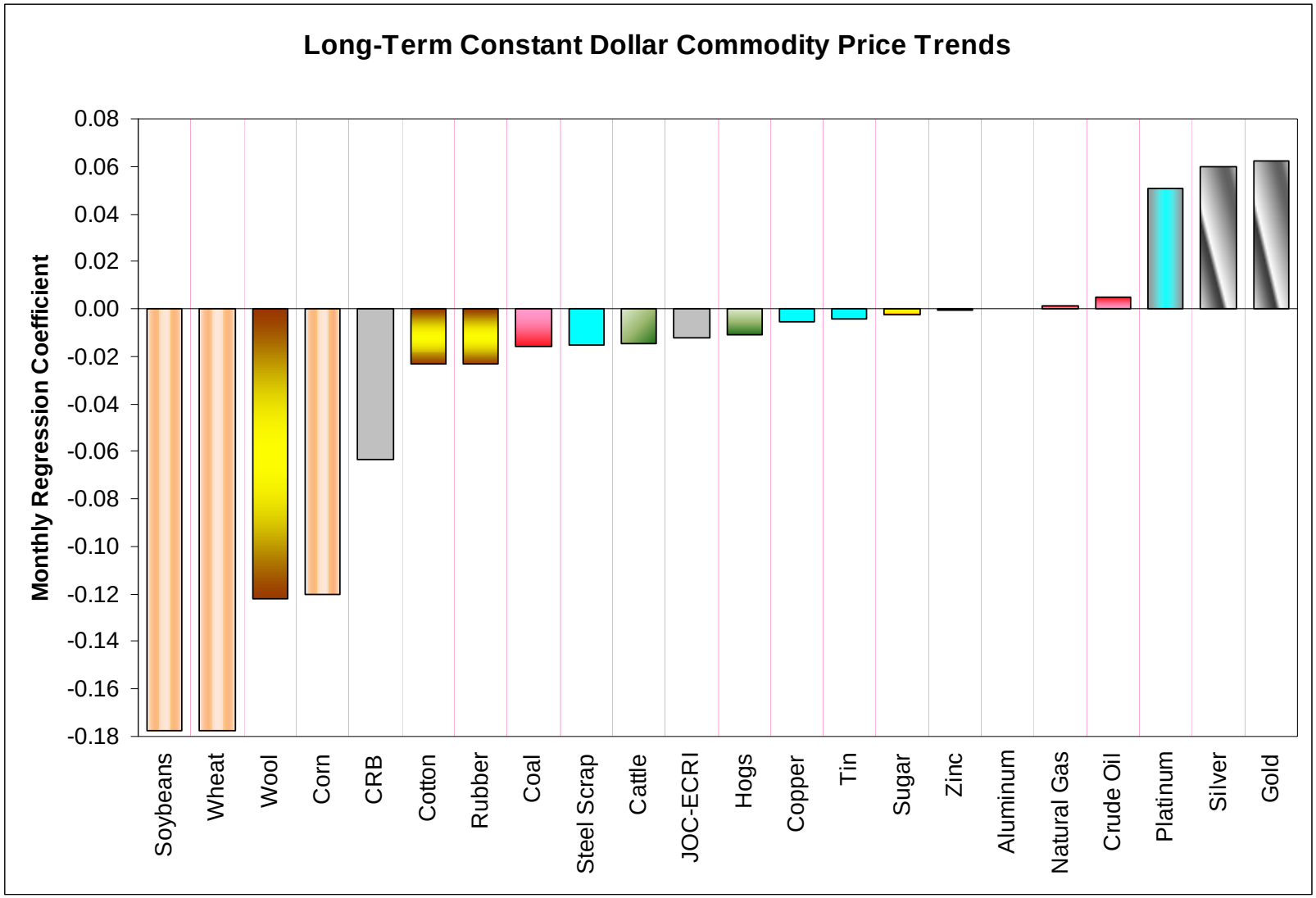
A Secular Rally Or A Recovery?



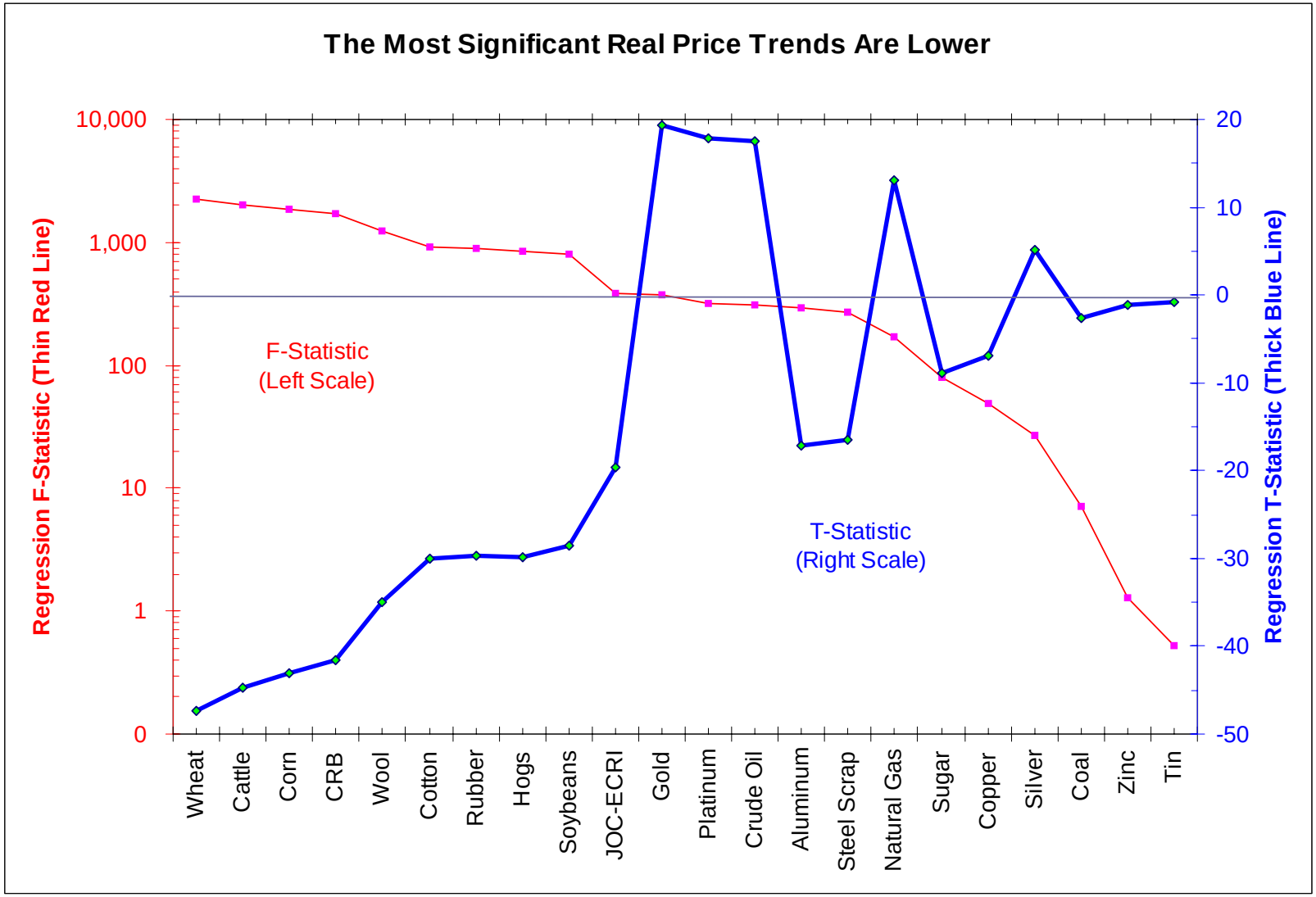
Productivity Improvements Persist For Decades



Most Constant-Dollar Trends Are Negative



Negative Trends Are More Statistically Significant



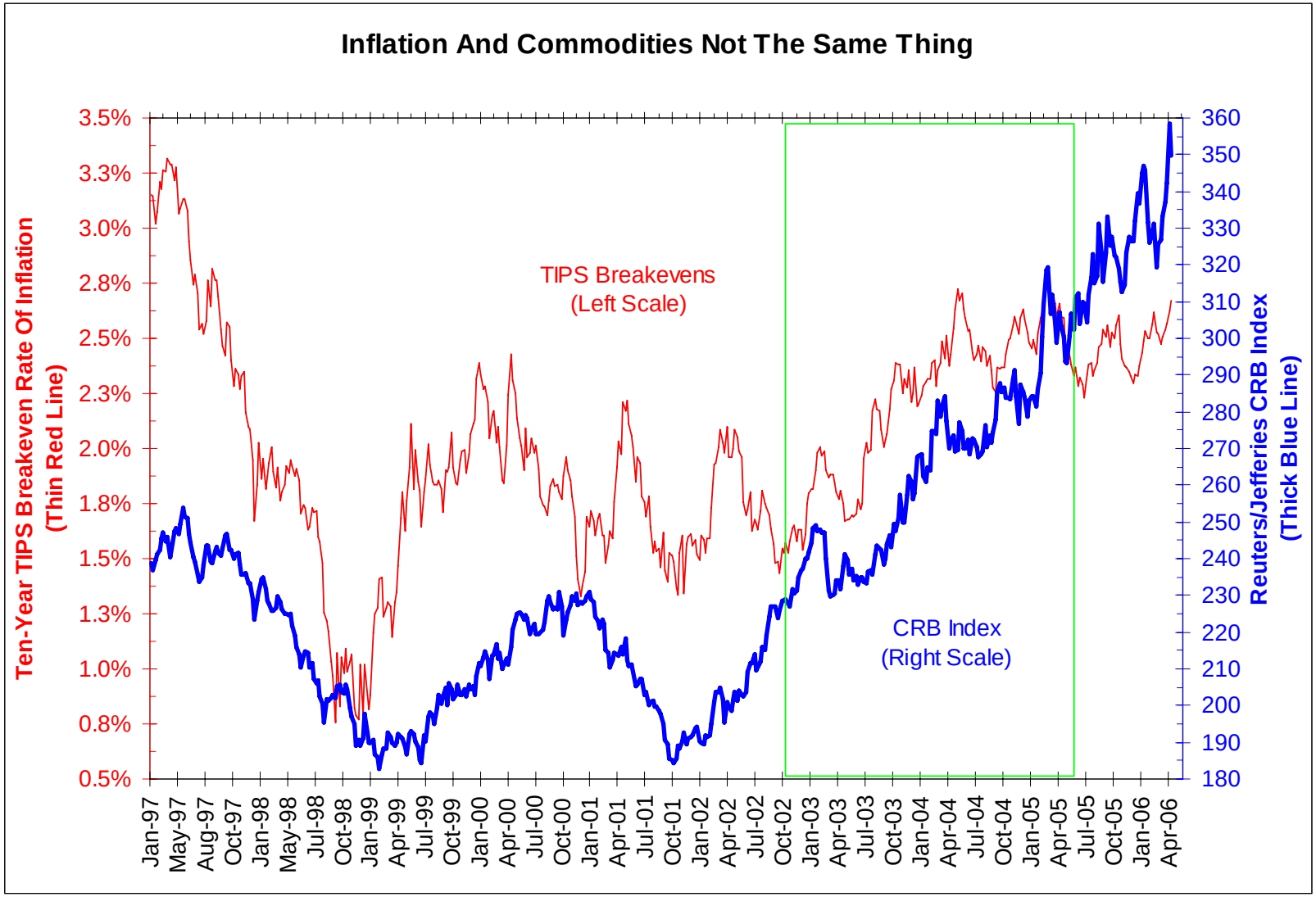
Money & Commodities

- A common belief holds commodities to be a warning of inflationary pressures loose upon the land by virtue of excess money
- A long-term comparison of the Reuters/Jefferies CRB index against the yield curve reveals no causal relationship
- However, some evidence suggests changes in the CRB lead changes in the monetary policy as measured by the yield curve

The CRB And TIPS

- Does the CRB rise and fall with the ten-year TIPS breakeven rate of inflation? No; the two rise together during the combination of strong economic growth, monetary stimulus and a weaker dollar
- The relationship seen after the end of the bear market in 2002 ended in mid-2005 when the bond market realized the Federal Reserve was going to continue raising rates

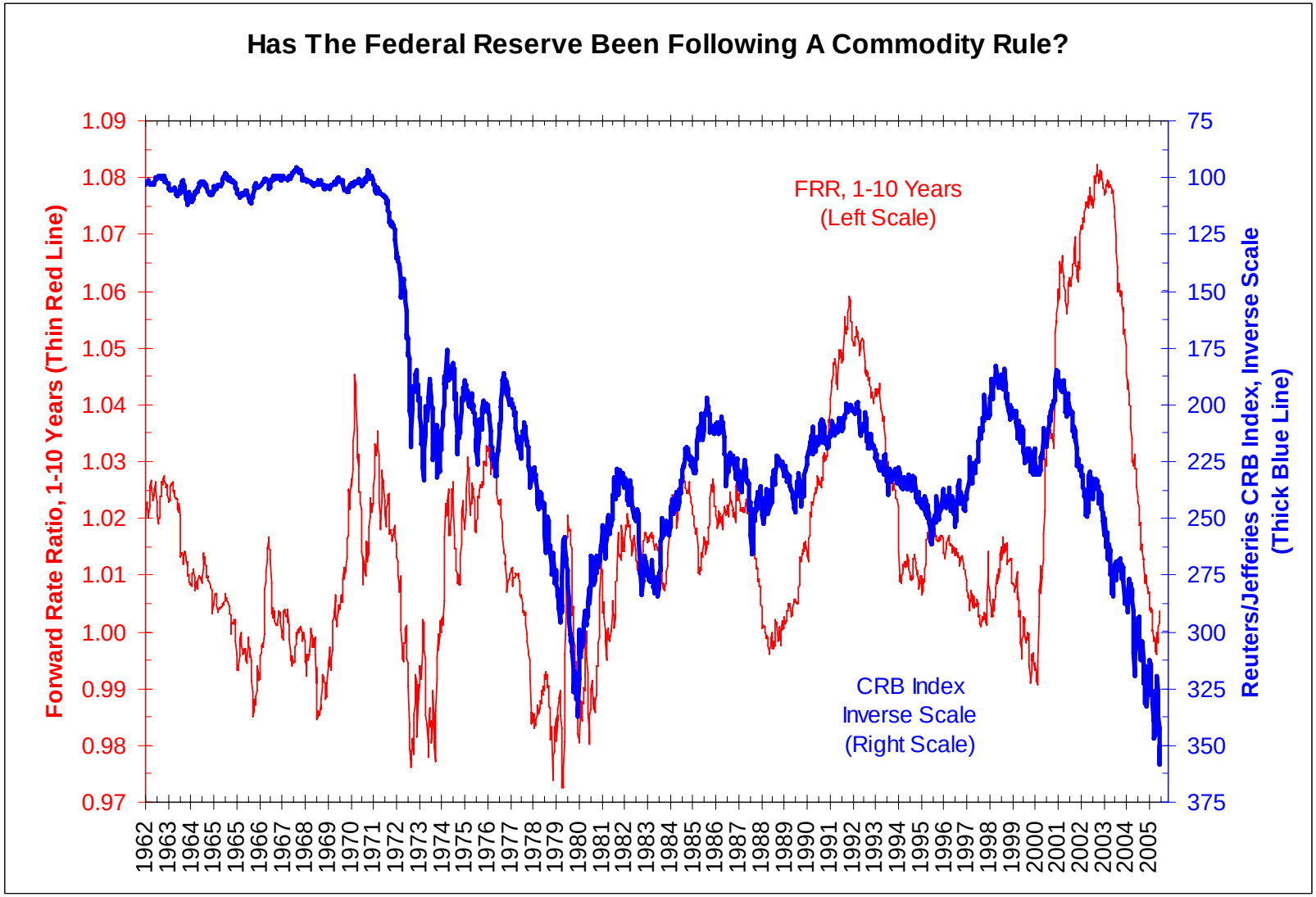
Commodities & Inflation Expectations Coincide During Growth Periods



Monetary Policy & Commodities

- After the 1970s inflation experience, changes in the yield curve were preceded by changes in the CRB index
  - A 1980-1986 drop in the CRB led a steeper yield curve
  - The same applies to 1988-1993
- The post-2001 commodities rally preceded the massive flattening of the yield curve seen since 2003
- Subconsciously or otherwise, the Federal Reserve appears to be reacting to commodity prices

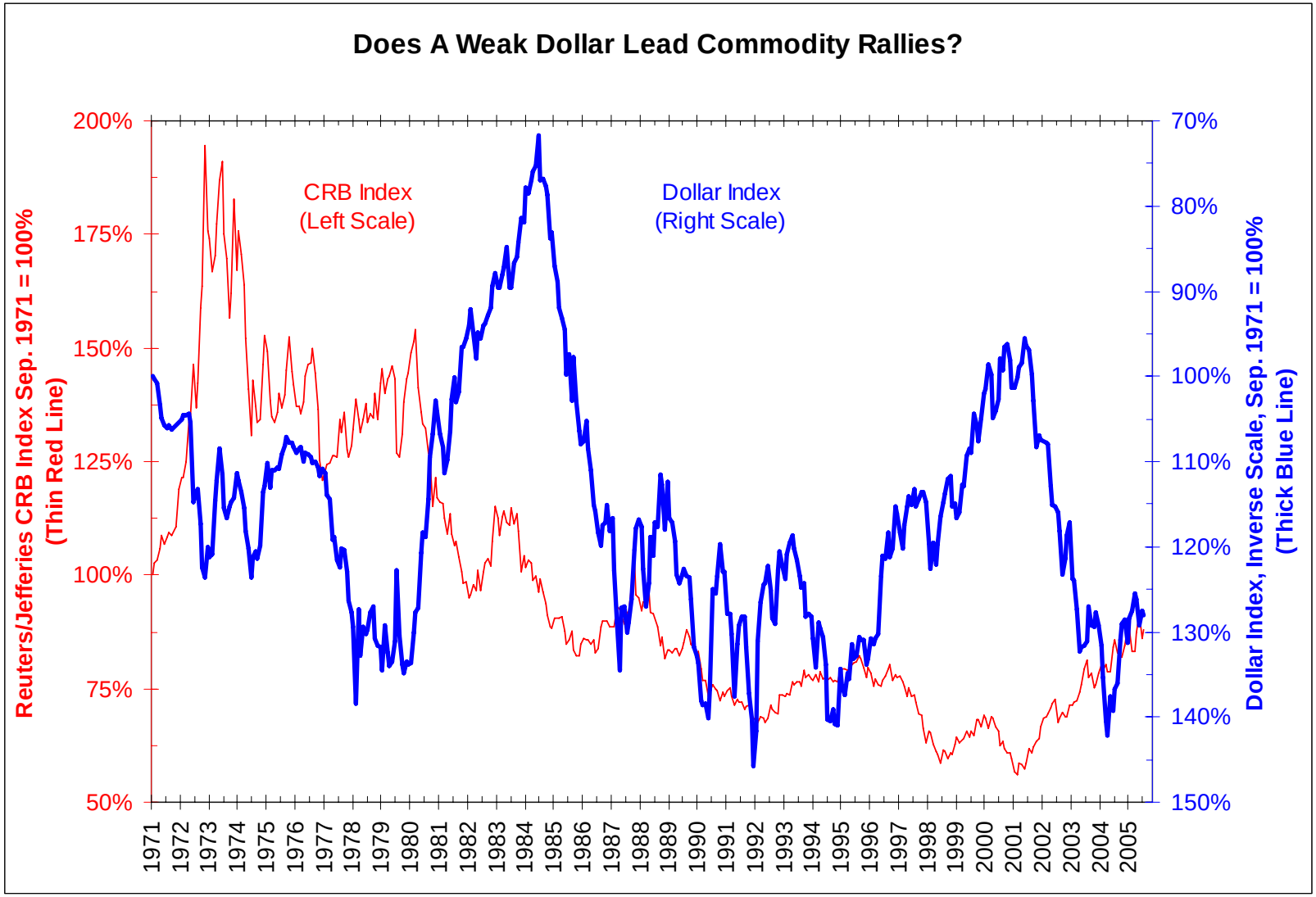
Commodity Trends Precede Monetary Changes



Commodities & The Dollar Index

- Another common belief holds a weak dollar index (DXY) leads strong commodity prices
- The logic is impeccable: If each dollar is worth less, the dollar price of “stuff” must rise
  - This is a nice theory; too bad it has not worked over the entirety of the floating exchange-rate era since 1971

Commodities & Exchange Rates



Section II:

Should Commodities Be Indexed?

Attributes Of An Index

We should expect components of an index to:

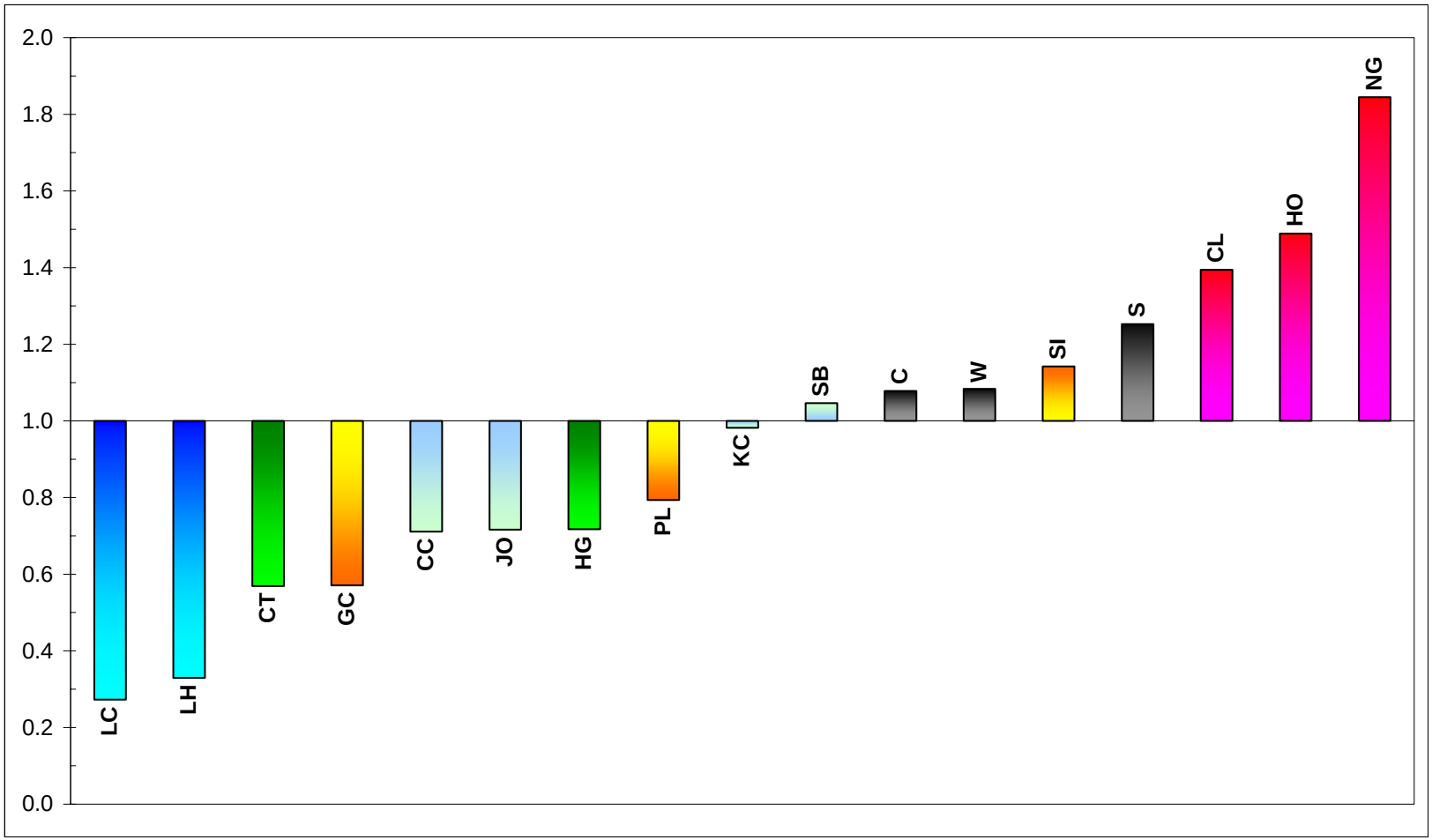
- Not have zero or negative correlation to each other
  - Negative correlation implies you are trading against yourself
- To have stable correlation over time
  - Portfolio decisions need to be based in some part on expected behavior
- To react in consistent and predictable ways to movements in common factors
  - We have already seen how this condition is not satisfied for movements in inflation, currencies or the yield curve

Note Presence Of Near-Zero And Negative Correlations

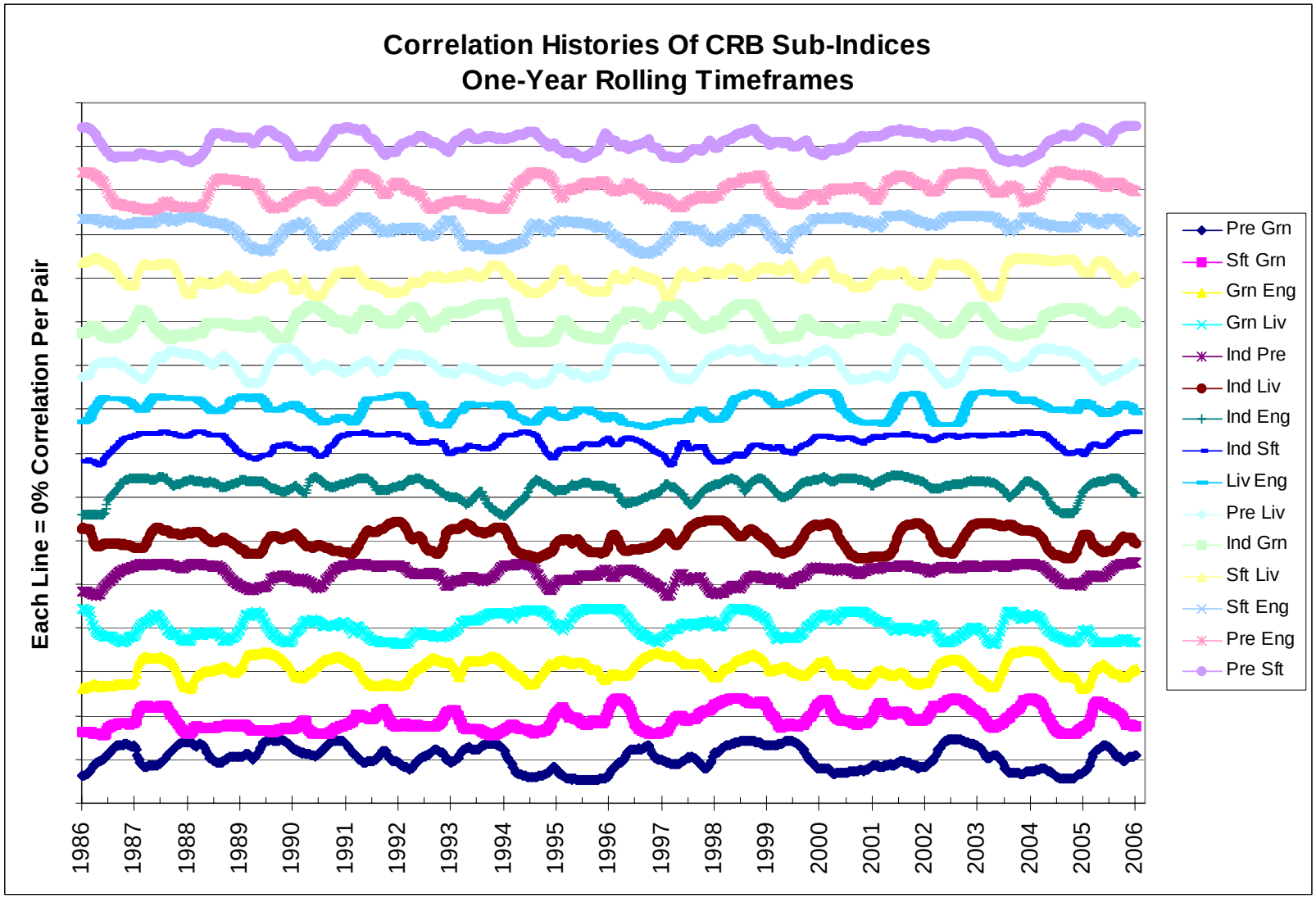
Correlation of Weekly Average Cash Market Returns, Jan. 1983 - Apr. 2005

	C	CC	CL	CT	GC	HG	HO	JO	KC	LC	LH	NG	PL	S	SB	SI	W
Corn	1.000																
Cocoa	0.059	1.000															
Crude	-0.003	-0.011	1.000														
Cotton	0.155	0.088	-0.100	1.000													
Gold	0.030	0.119	0.154	-0.025	1.000												
Copper	0.023	0.067	0.055	0.101	0.194	1.000											
Htg. Oil	-0.021	-0.004	0.655	-0.045	0.123	0.040	1.000										
Or. Juice	0.110	0.017	0.045	0.038	0.041	0.022	0.022	1.000									
Coffee	0.083	0.102	0.004	0.038	0.048	0.067	-0.011	0.024	1.000								
Cattle	0.025	-0.018	0.047	-0.010	0.016	0.027	0.085	0.013	0.011	1.000							
Hogs	0.023	0.011	0.033	0.009	0.032	0.006	0.009	0.015	-0.032	0.129	1.000						
Nat. Gas	0.054	-0.069	0.129	0.016	0.091	0.008	0.206	-0.008	0.080	0.025	0.018	1.000					
Platinum	0.044	0.051	0.132	-0.029	0.490	0.144	0.100	0.044	0.108	0.052	0.007	0.080	1.000				
Soybeans	0.571	0.084	-0.012	0.166	0.132	0.110	0.018	0.095	0.078	0.046	0.016	0.028	0.060	1.000			
Sugar	0.100	0.090	-0.011	0.032	0.079	0.088	0.027	0.031	0.049	0.006	-0.016	0.013	0.083	0.100	1.000		
Silver	0.048	0.136	0.134	-0.003	0.677	0.198	0.098	0.030	0.082	-0.013	0.017	0.081	0.409	0.138	0.118	1.000	
Wheat	0.399	0.085	0.003	0.046	0.102	0.084	0.015	0.077	0.046	0.056	-0.031	0.025	0.121	0.323	0.120	0.093	1.000
CRB Beta	1.078	0.711	1.394	0.569	0.571	0.717	1.489	0.716	0.982	0.273	0.329	1.845	0.794	1.253	1.046	1.142	1.083

Betas of CRB Components: 1983 - 2005



Unstable And Inverting Sign Correlation Over Time



Section III:

Why Long-Only?

General Comments On Indexation

- If it did not exist, would we need to invent it? While few money managers today remember a world without indexation, it did exist once
- It influences behavior when adopted widely. The few and early free-riders do not change market behavior, but we cannot say the same once it becomes the norm
- What is the correct approach? A study of the Merck Manual for physicians revealed a fascinating pattern: The less that was known about treating a disease, the longer the entry in the Merck Manual
- We have several widely divergent approaches to the construction of commodity indices, which indicates we have no *a priori* knowledge on how to construct one properly. All approaches, therefore, are *ad hoc* reactions to past performance as they seek to attract investment funds
- But if the institutional investor is a hammer, all investment problems are supposed to look like nails, and we force commodities into indices, for better or worse

Technical Analysis Differences Between Stocks And Futures

1. Futures have expirations
2. Stocks fulfill their economic mission at birth; futures are designed for price discovery, risk management and commerce facilitation
3. Until recently, stocks were far more subject to the mechanics of indexation
4. Stocks are not the intellectual property of an exchange; exchange hours affect trading patterns
5. The underlying asset for futures contracts remains constant over long periods of time
6. Stocks have discrete dividends and are subject to corporate actions
7. Stock prices are far more volatile, can go to zero and are unbounded. Commodity prices are bounded by process margins
8. Commodities tend to be mean-reverting over time; stocks tend to trend
9. Stocks gap on news more violently and with greater regularity
10. Futures markets treat buying and selling symmetrically
11. Futures margins are risk-based and often force decisions
12. Futures markets are taxed differently

Returns And The Forward Curve

- Commodity index funds are stymied by Points 7 & 8 above. Neither they nor anyone else can promise a long-term bull market in commodities due to the self-correcting nature of commodity price cycles
- The hope, therefore, is to distinguish commodity futures from cash commodities by virtue of Points 1 & 2 above
- Promises have been made, implicitly and otherwise, that this is an intrinsic source of return for commodity investors

Convenience Yield

- Keynes observed that futures prices often traded below their cost of carry and sometimes traded below the current spot price for the commodity itself
- He deduced the willingness of producers to sell for less than full carry value represented an insurance payment to risk-seeking speculators
  - The producers' hedge costs were known
  - The long speculators' returns remained at risk
- So long as the flow of insurance persisted, especially in extractive markets where the cheapest source of storage was the producer, speculators stood a chance of garnering a consistent stochastic return over time

$$CY = [1 + \frac{Month_1 * e^{rt} + Storage - Month_2}{Month_1}]^{365/d} - 1$$

Limitations To Convenience Yield

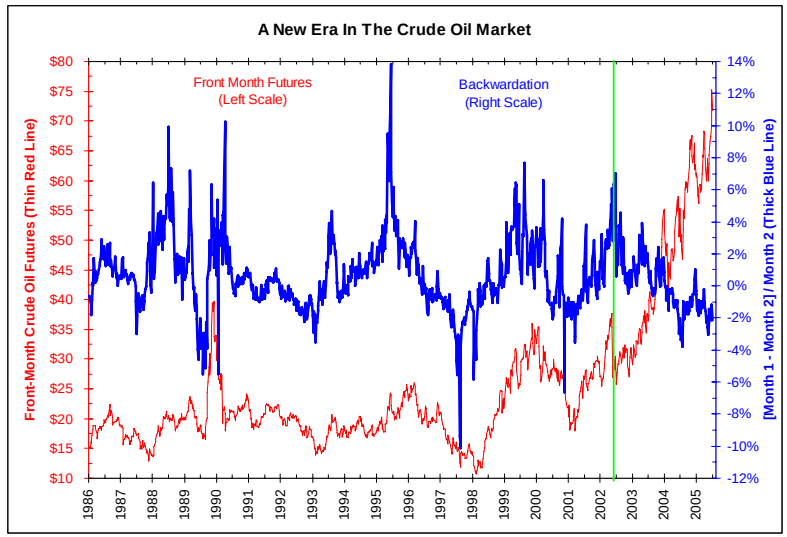
- Positive convenience yield is evidence of producers buying insurance
  - There is a finite potential pool of insurance equivalent to the quantity produced multiplied by expected downside risk
- Those seeking to capture this yield are writing insurance
  - Increased participation lowers the potential return per insurance writer
  - Insurance costs have become negative as formerly backwardated markets have started to trade in a carry

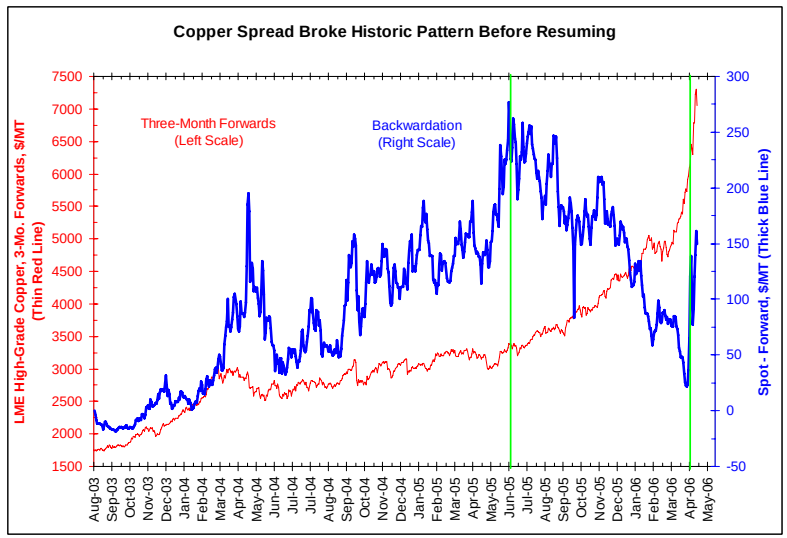
Which Commodities Should Have Positive Convenience Yield?

- Not all commodities are created equal
- Commodities that should exhibit positive convenience yield are those
  - Whose cheapest place of storage is with the producer
  - Are subject to logistical constraints in their production and distribution
  - Are prone to demand surges and/or supply outages
- These include crude oil and the base metals
- Seasonal effects preclude grains, soft commodities, natural gas, heating oil, gasoline and livestock from exhibiting consistently positive convenience yields
- The precious metals should never trade with a positive convenience yield
- All commodities whose convenience yields are not positive should see their back months rise in price more than their front months during bull markets. This will produce a negative roll yield during bull markets and erode whatever positive returns are present from price alone

Patterns Work Until They Are Recognized

- Two of the markets that should exhibit rising convenience yield in a bull market, crude oil (top chart) and copper (bottom chart) have seen notable reversals of pattern contrary to both the above-stated financial theory and their own history
- We need to explain how this could happen

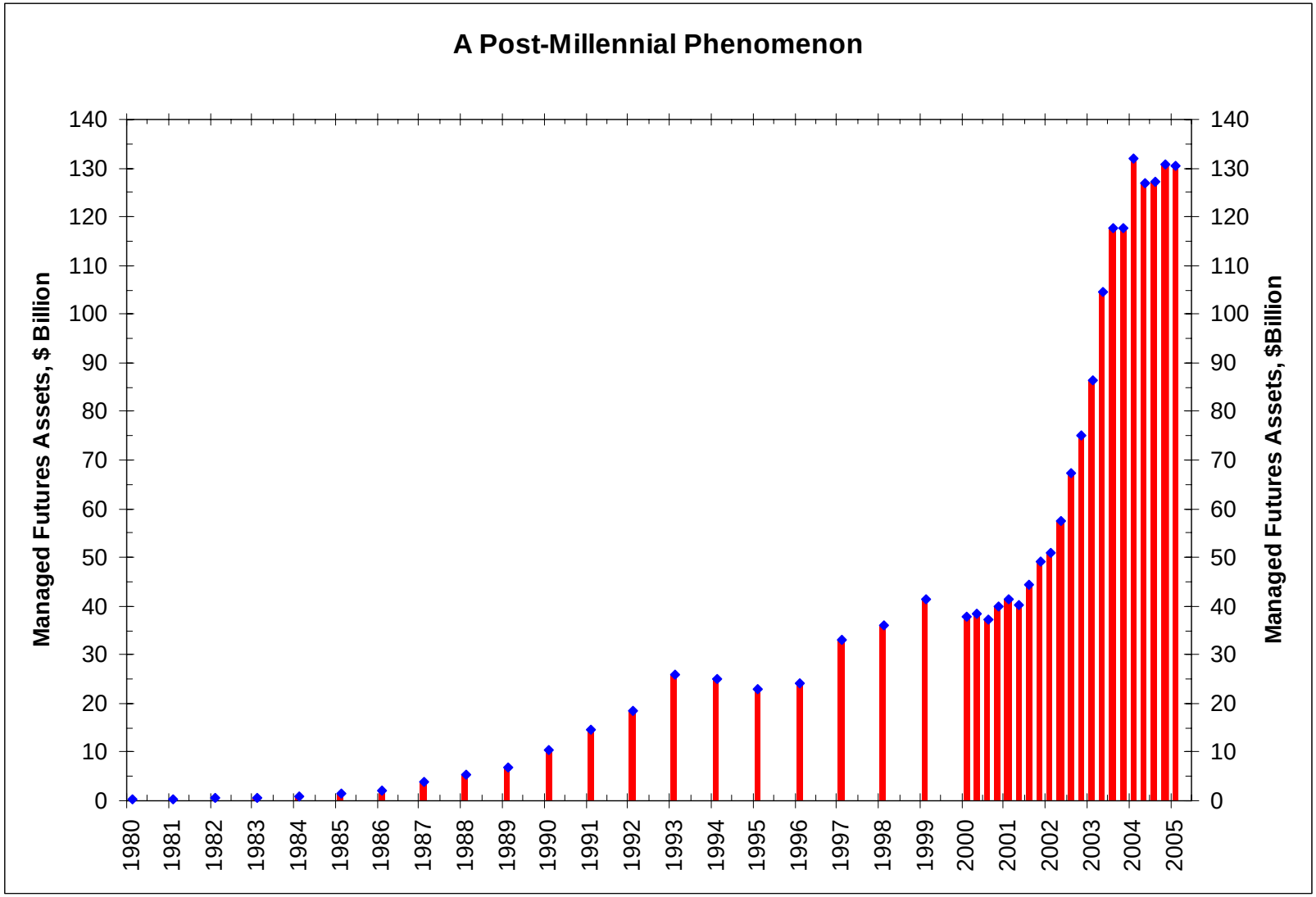




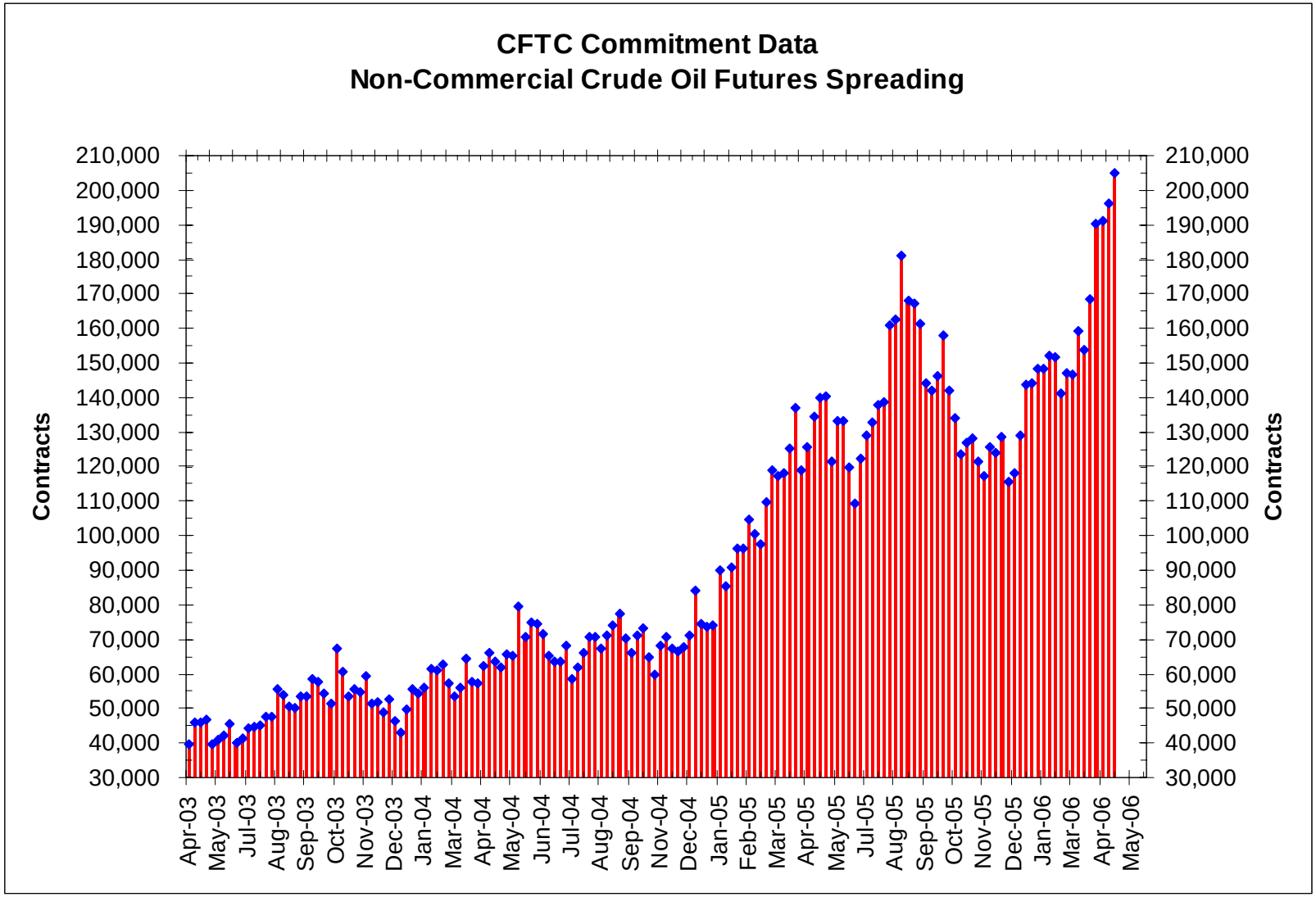
The Roll Gets Crowded

- Just as indexation can produce absurdities in stocks – see Yahoo's 20% jump in the hour it was added to the S&P 500 in December 1999 – it can produce crowding effects during the monthly roll
- What worked with $5 billion may get awkward at $70 billion, especially when everyone knows the dates and quantities of the trade
- This invites front-running, a polite way of describing far more graphic treatment of the funds involved in the roll
- Some indices roll on days 1-5 of the month, some on days 5-9. This is immaterial: Unless the strategy has an *a priori* justification in theory, it is simply an afterthought to the asset-gathering process
- The enormous growth in managed futures, related to but not the same thing as long-only commodity indices, has been concentrated in a handful of contracts. The Goldman Sachs Commodity index is 75.8% in the energy contracts. The other commodities are in there just to be sociable

No One Goes There Anymore; It Is Too Crowded



Spread Traders Love Commodity Index Funds



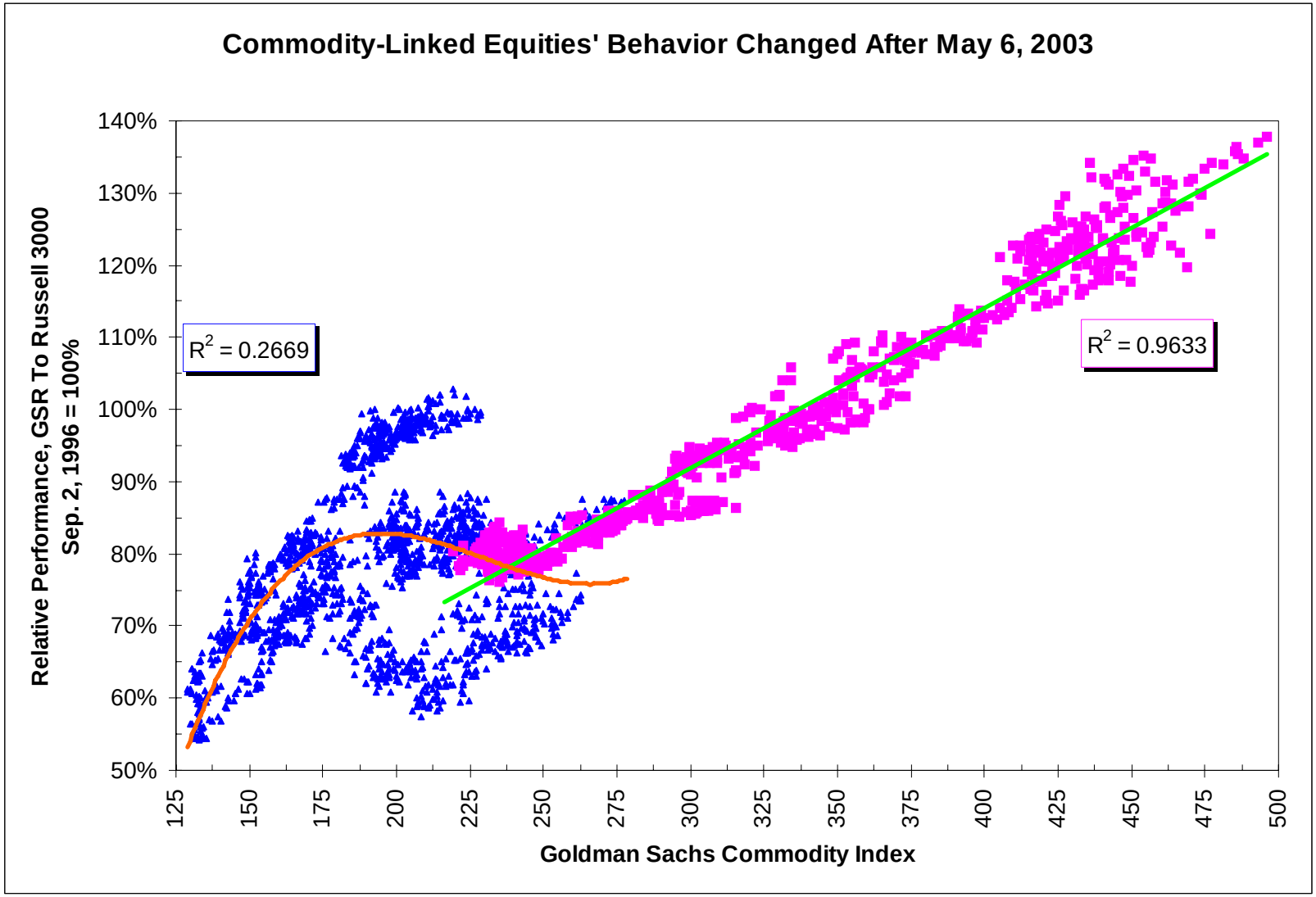
Section IV:

Thoughts On Commodity-Linked Equities

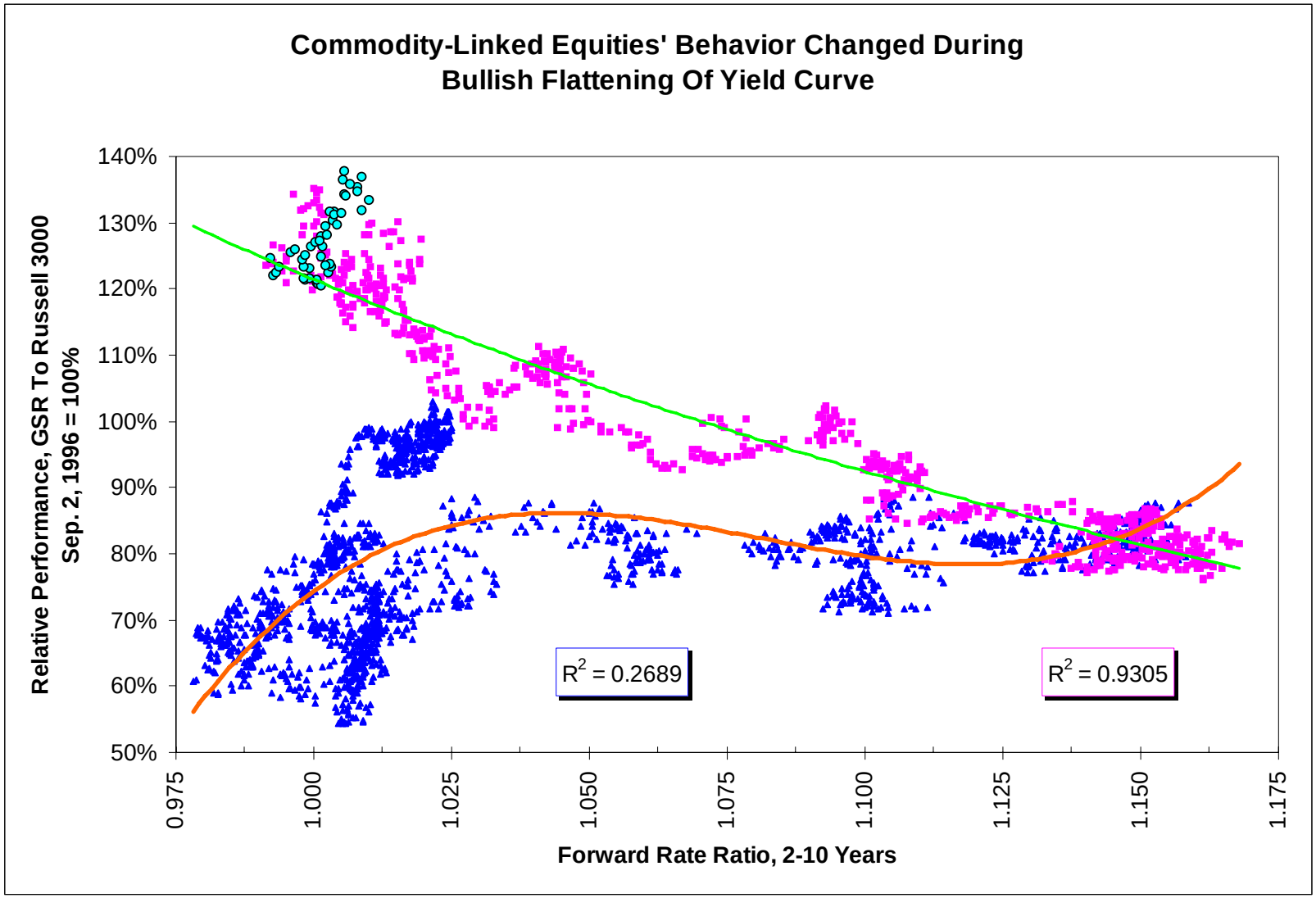
What Should The Pattern Be?

- Ideally the alpha of any commodity-linked equity should describe a call option on its underlying commodity
  - It should rise earlier and faster than the commodity during bull phases
  - It should fall less during bear phases as producers get to shut in high-cost facilities
- Producers who hedge return this natural call option to the market
- Evidence suggests the pattern has changed with the flood of money into commodities

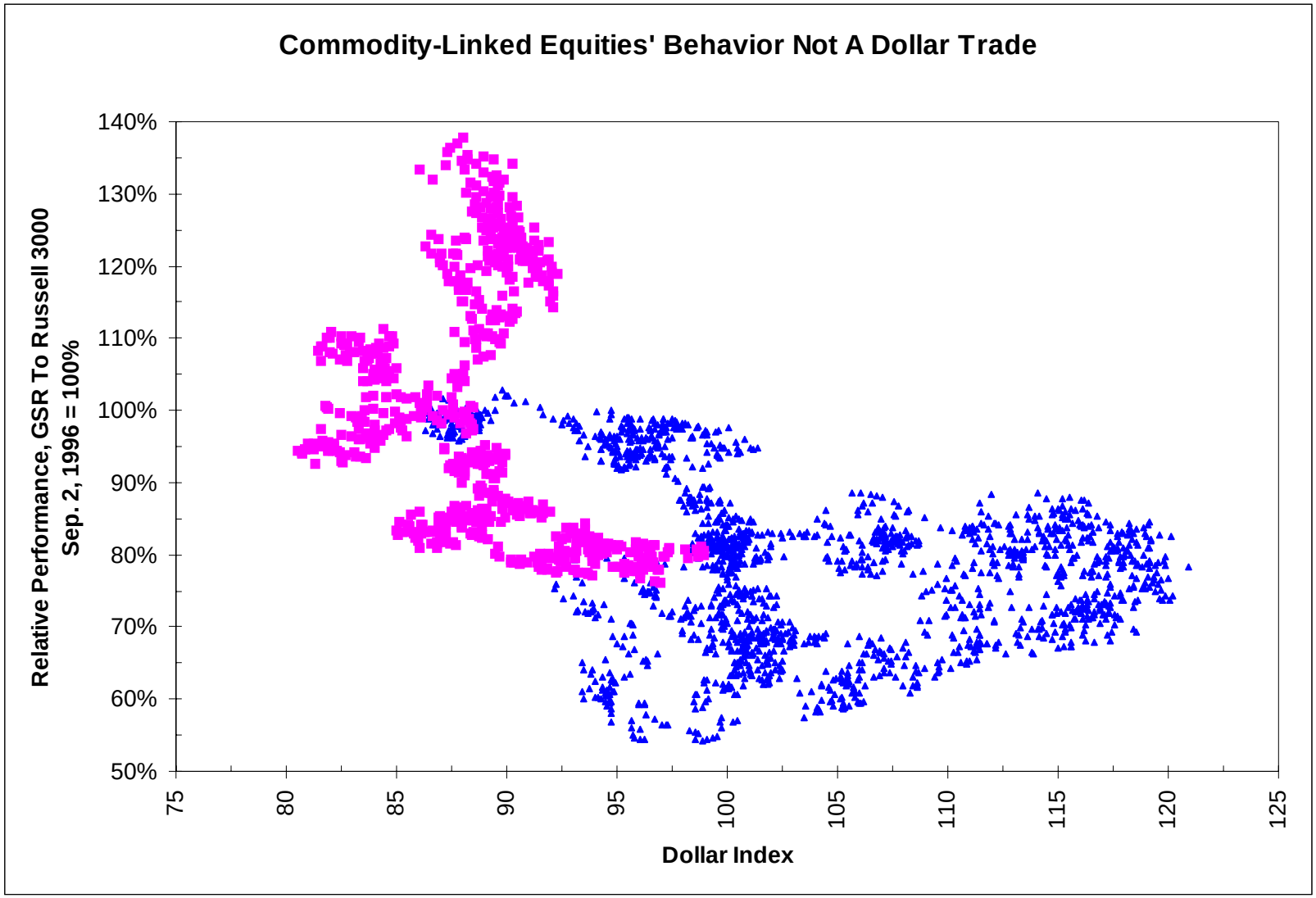
The Liquidity Trade of 2003 Lives On



The Yield Curve's Impact Changed After May 2003



Commodity Stocks Make Poor Dollar Hedge



Conclusions

- Commodity futures by their very design are a zero-sum game
  - Equities are a positive-sum game
  - Fixed-income and real estate can provide defined return streams at principal risk
- The cyclical and mean-reverting nature of commodity prices and their observed declining constant-dollar prices over time should give pause to those seeking this as a source of return
  - Petroleum markets may be an exception here. As crude oil is produced without replacement and there is no recycling, it may possess the same geometric Brownian motion with a positive drift term seen in equity markets

Conclusions (Continued)

- The harvest of convenience yield is a self-defeating strategy once adopted widely
- Higher price levels produced by buying irrespective of fundamentals will encourage future production and discourage demand, another self-defeating strategy
- Rebalancing yields are uncertain given the wildly unstable correlation between unrelated commodities
- In sum, we are in a self-fulfilling bull market at present wherein higher prices attract new funds. This is referred to as a “bubble” in other walks of life