

# The Recent Metals Price Retreat: So Long Super Cycle?

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**DIVISION OF ECONOMICS & BUSINESS**  
COLORADO SCHOOL OF MINES

# Mineral Economics at Colorado School of Mines



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- At CSM's Division of Economics and Business, we welcome opportunities to engage faculty members and Mineral Economics graduate students in industry-funded research projects.
- Help graduate students studying economics, finance, and operations research applied in the mining, minerals and energy sectors.
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# Abstract

Cuddington-Jerrett (2008) define super cycles as sustained expansion phases in metals prices lasting 10-35 years. They argue that statistical evidence suggests that a fourth cycle (since the mid 1850s) began to emerge in 1999, due to industrialization and urbanization in China.

In light of the abrupt retreat in metals prices in late 2008, this paper asks: is the super cycle still in process? We argue that business cycle fluctuations can obscure longer-term super cycle behavior, but that long-term super cycle fundamentals are probably still ‘in play.’ Time will tell.



# Discussion Outline

- I. Real Versus Nominal Prices
- II. Super Cycles
- III. Global Recession
- IV. Business Versus Super Cycles
- V. Implications of Business-Cycle Downturn On Super Cycles
- VI. Concluding Remarks



# I. Real Versus Nominal Prices

- It is useful to compare nominal and real prices over a long time span to get some perspective on whether current metal prices are 'high' or 'low' by historical standards.
- Real prices  
= nominal price/U.S. consumer price index



# Mineral Commodity Prices: High or Low?

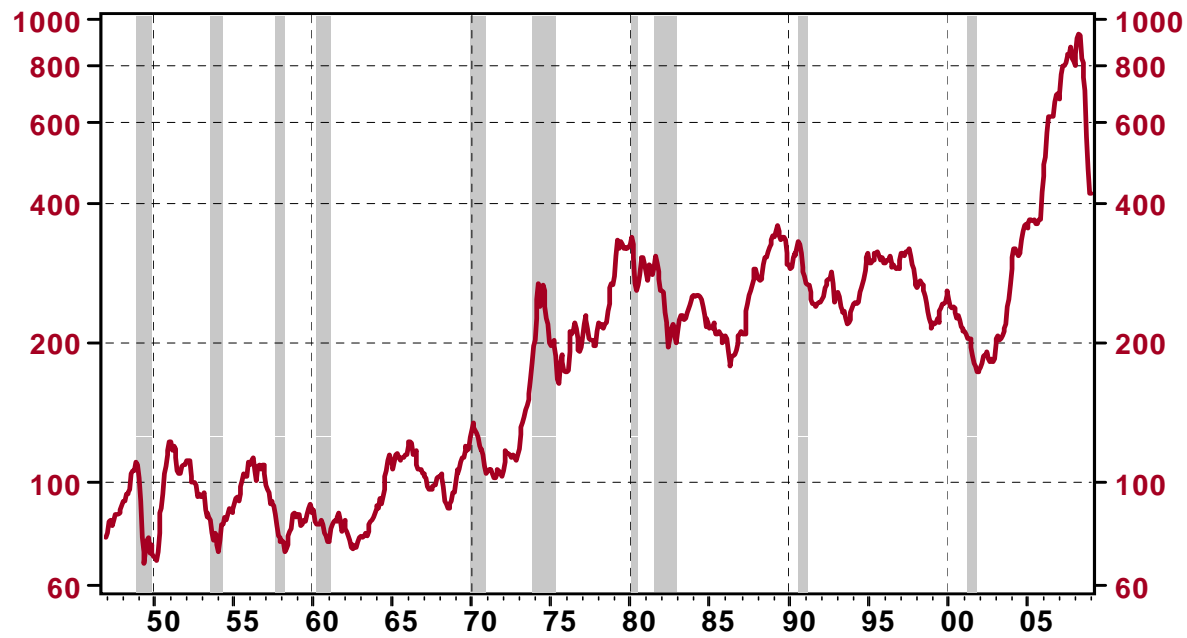
Let's look at:

- CRB-Metals Price Index
  - CRB metals (sub-index of 5 markets): copper scrap, lead scrap, steel scrap, tin & zinc
  - Available monthly from Jan 1947 –present
  - Source: Reuters-CRB Commodity Index Report/Haver Analytics.
- Gold (London PM fixing)
- Crude Oil (WTI)

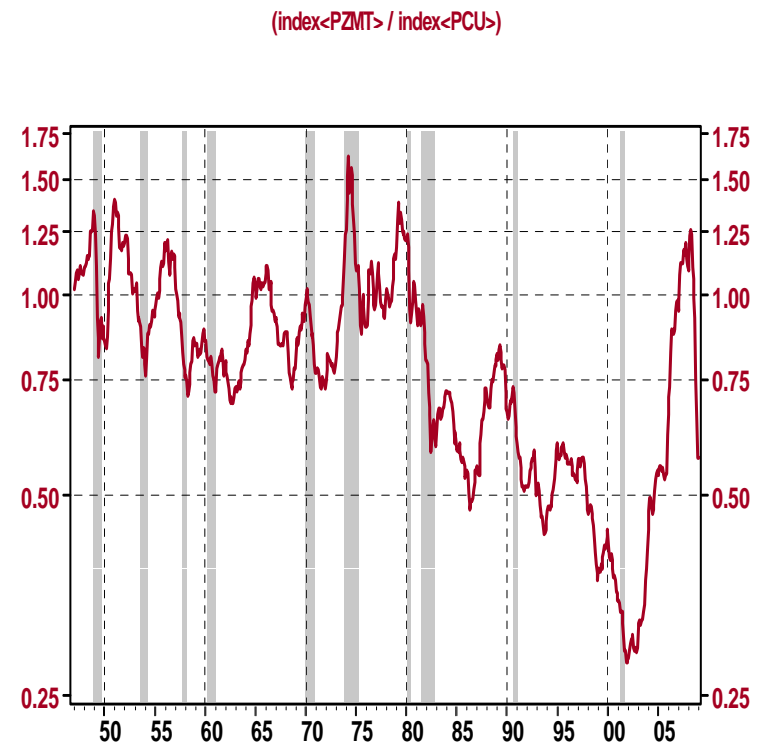
# CRB-Metals Price Index

KR-CRB Spot Commodity Price Index: Metals

1967=100



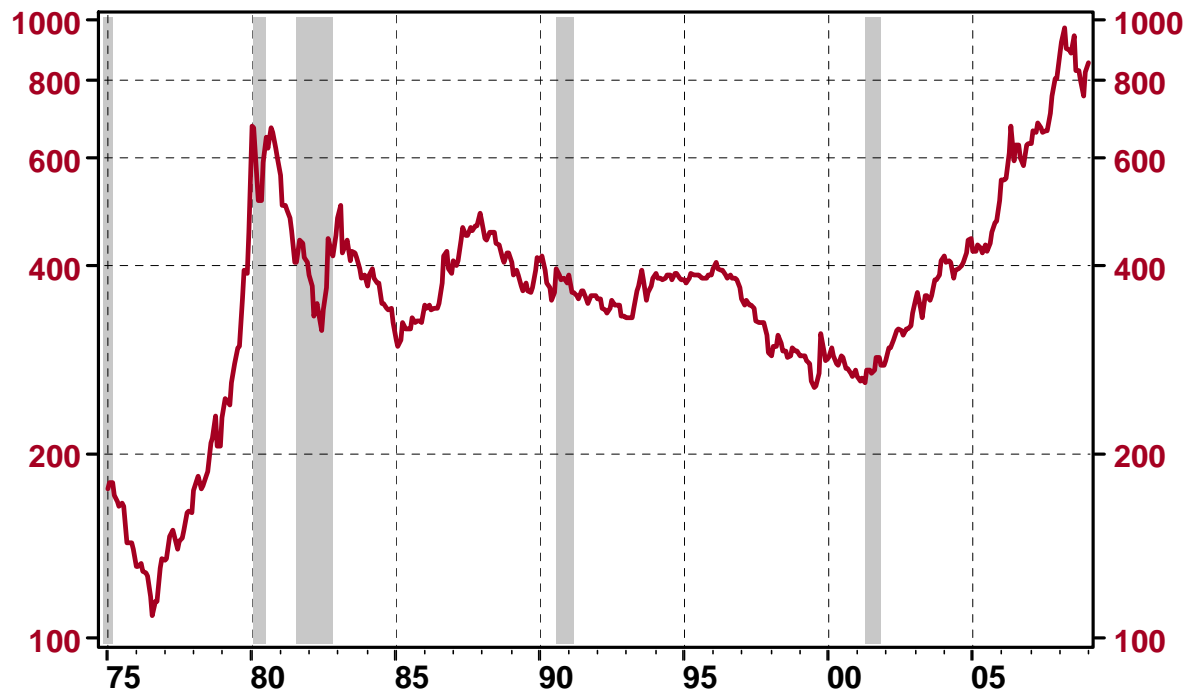
# CRB-Metals Price Index: Nominal vs. Real



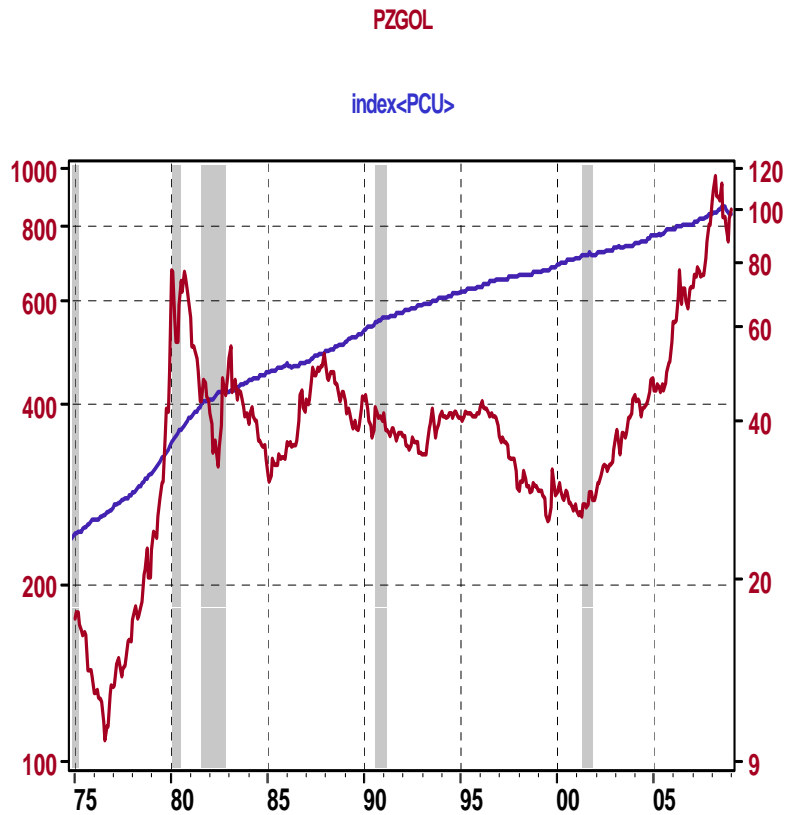
# Gold Price

Cash Price: Gold Bullion, London Commodity Price, PM Fix

US\$/troy Oz

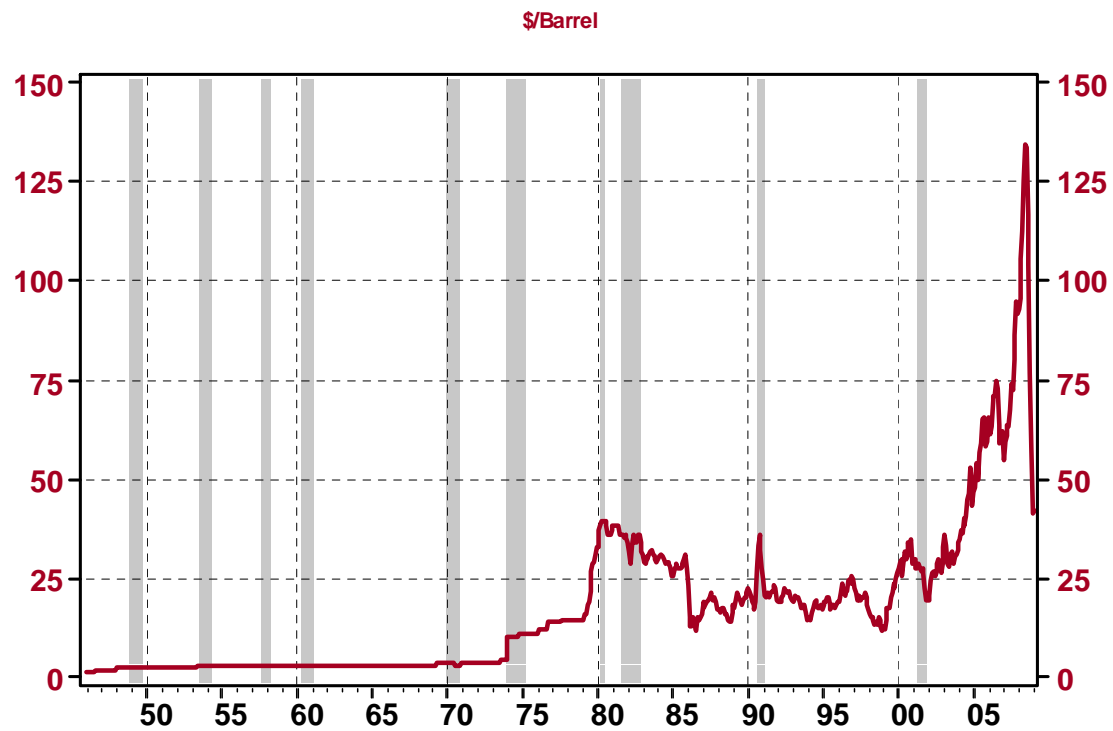


# Gold Price: Nominal vs. Real



# Crude Oil Price (WTI)

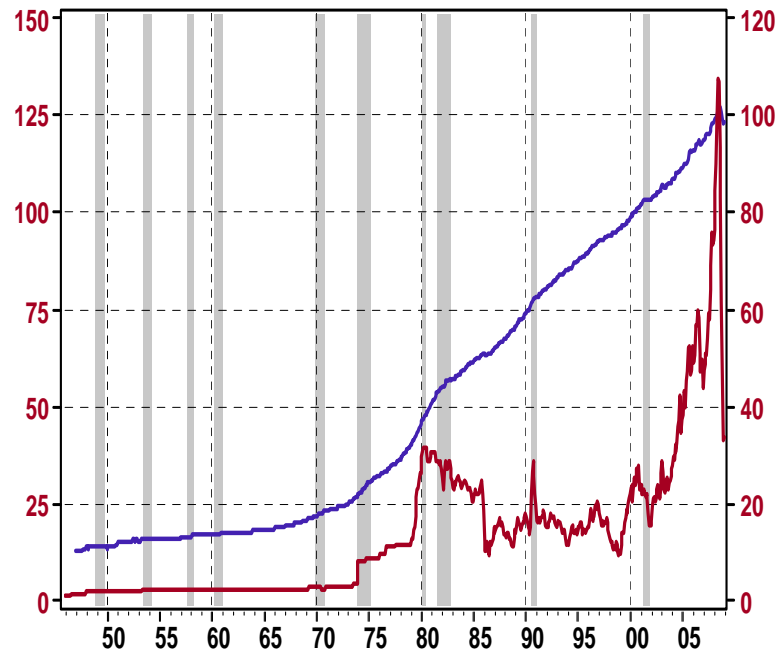
Spot Oil Price: West Texas Intermediate [Prior'82=Posted Price]



# Crude Oil Price: Nominal vs. Real

Spot Oil Price: West Texas Intermediate [Prior'82=Posted Price]  
\$/Barrel

CPI-U: All Items  
2008=100



(PZTEXP / index<PCU>)

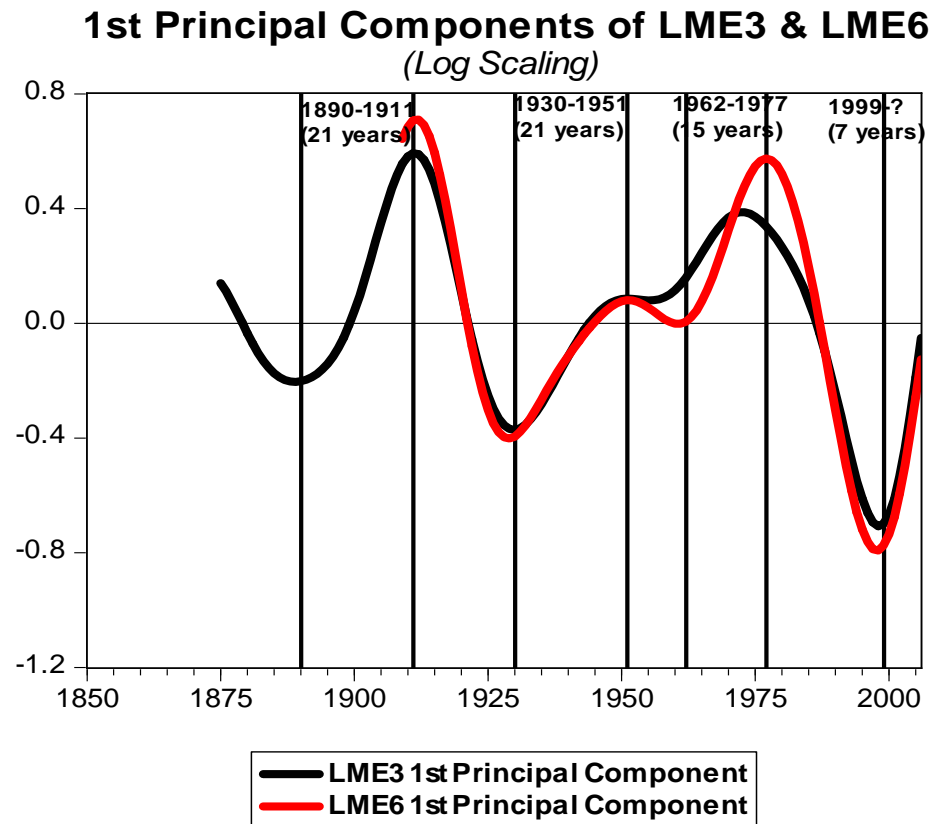




## II. Super Cycles in Metals Prices

# Cuddington-Jerrett IPIA Presentation – 2008

- Evidence for the emergence of a fourth metal price super cycle since the mid-1850s.
- A Super Cycle *expansion* phase measured from trough to peak:
  - 10-35 years

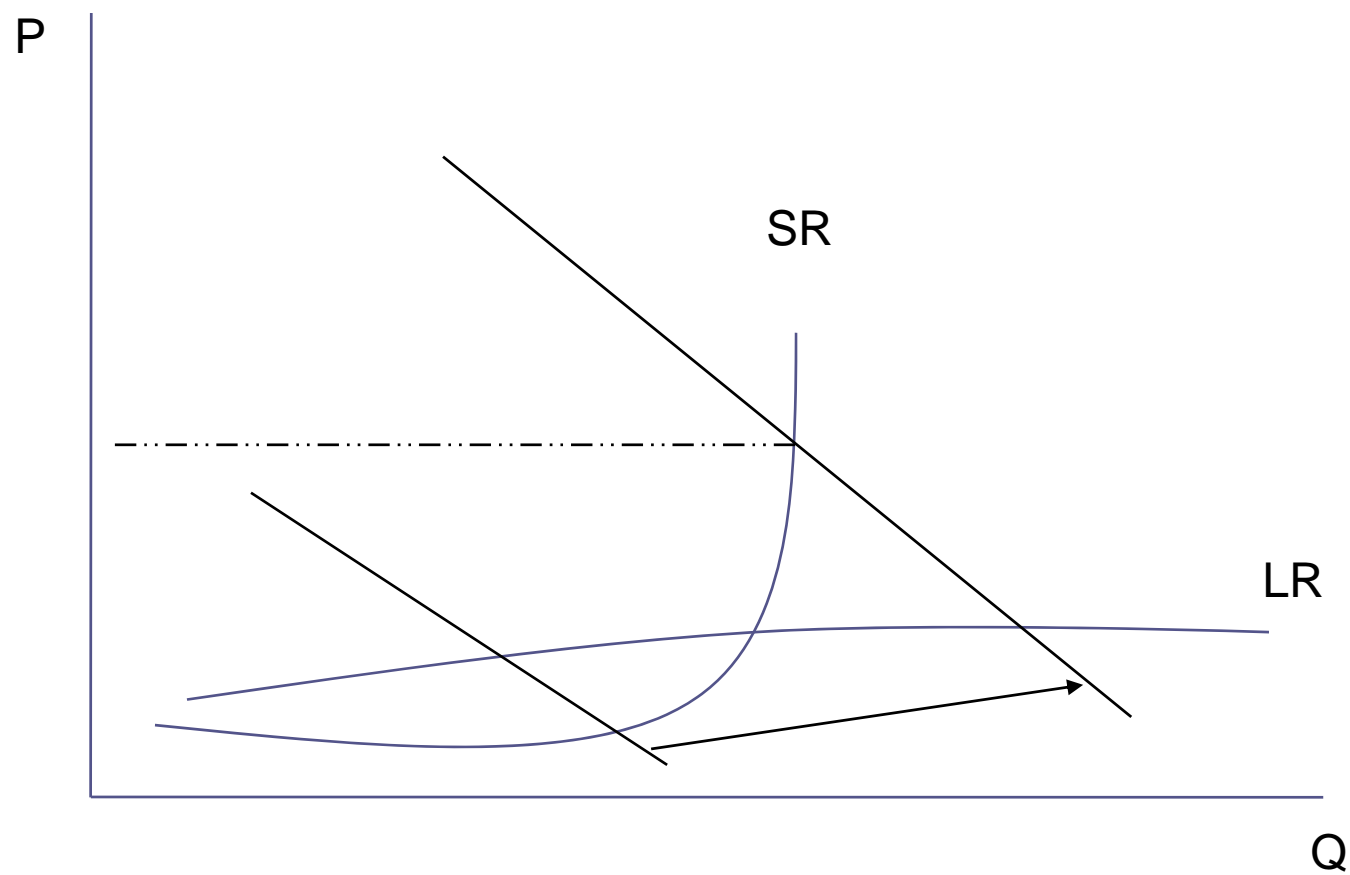




# Super Cycles: Necessary Ingredients

- **Demand** - Rapid industrialization and urbanization phase of economic development process in China.
- **Short-run Supply Constraints** - Very price-inelastic short-run (SR) supply (reflecting mining capacity constraints and sharply rising input prices).
- **Slow capacity adjustment** - toward the long-run (LR) supply curve, which is presumed to be essentially horizontal at LR marginal production cost.

# SR versus LR Supply Curves



# How long would we expect a super cycle to last?

- Duration of metals-intensive development phase? (~ 20-30 years?)
- Speed of capacity expansion in response to demand boom? (~ 10 years)
  - Radetzki et al (*Resources Policy* 2008)
  - **The speed of the LR supply response is critical for sustained demand expansion to give rise to a super cycle.**

# Causes of the Metal Price Retreat

- **Severe recession** in industrial countries and growth slowdown in developing countries.
- Sharp reversal of **speculative (hedge fund) investments** in commodities, in general, and metals and energy products, in particular?
  - Difficult to prove, but price reversal was very rapid!
- End of **excessive monetary expansion** causing commodity price overshooting behavior? See Jeff Frankel's Harvard website.



# III. Global Recession



## IMF's *World Economic Outlook* (WEO)

- Published by International Monetary Fund (IMF) twice a year.
- Provides an informed analysis of the state of the global economy – free online:

<http://www.imf.org/external/ns/cs.aspx?id=29>

- IMF monitors global activity in the World Economic Outlook published bi-annually.

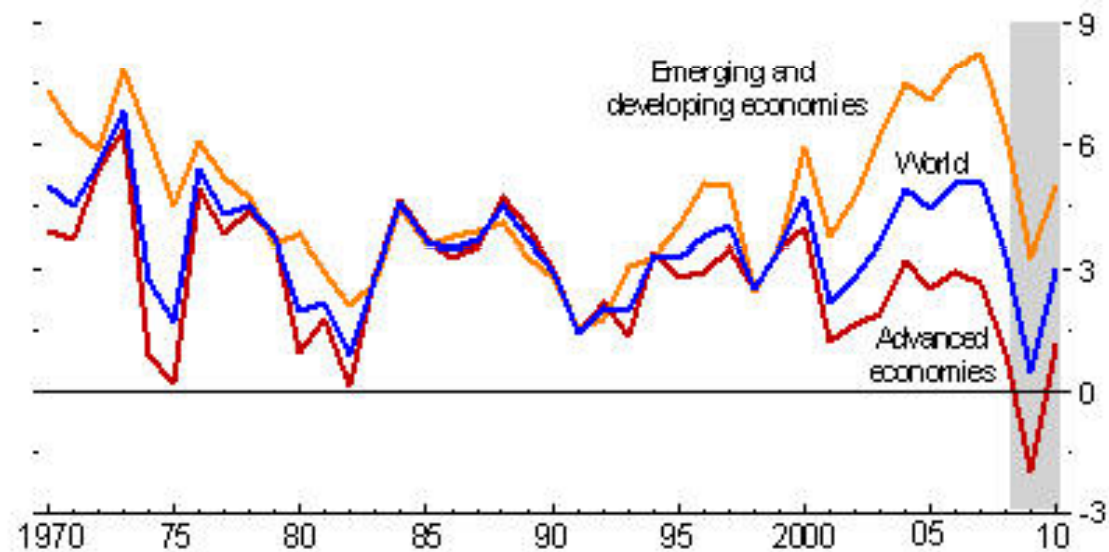


WEO Updates are provided when there are important changes in outlook to report.


- WEO -- April 2008
- WEO Update -- July 2008
- WEO -- Oct 2008
- WEO Update – Nov 2008
- WEO Update – Jan 2009
- WEO – April 2009 (?)

# Global Slowdown in GDP Growth?

**Figure 1. GDP Growth**  
(Percent change)



Source: IMF staff estimates.



## Latest IMF Global GDP Projections (1/28/09 news conference)

- Global GDP Growth revised sharply downward (again) by **-1.75%**
- November 2008: +2.25%
- January 28, 2009: +0.5%

## Latest IMF projections

(year over year percent change)

			Projections		Difference from 2008 WEO projections	
	2007	2008	2009	2010	2009	2010
<b>World output<sup>1</sup></b>	5.2	3.4	0.5	3.0	-1.7	-0.8
Advanced economies	2.7	1.0	-2.0	1.1	-1.7	-0.5
United States	2.0	1.1	-1.6	1.6	-0.9	0.1
Euro area	2.6	1.0	-2.0	0.2	-1.5	-0.7
Germany	2.5	1.3	-2.5	0.1	-1.7	-0.4
France	2.2	0.8	-1.9	0.7	-1.4	-0.8
Italy	1.5	-0.6	-2.1	-0.1	-1.5	-0.1
Spain	3.7	1.2	-1.7	-0.1	-1.0	-0.9
Japan	2.4	-0.3	-2.6	0.6	-2.4	-0.5
United Kingdom	3.0	0.7	-2.8	0.2	-1.5	-0.9
Canada	2.7	0.6	-1.2	1.6	-1.5	-1.4
Other advanced economies	4.6	1.9	-2.4	2.2	-3.9	-1.0
Newly industrialized Asian economies	5.6	2.1	-3.9	3.1	-6.0	-1.1
Emerging market and developing economies <sup>2</sup>	8.3	6.3	3.3	5.0	-1.8	-1.2
Africa	6.2	5.2	3.4	4.9	-1.4	-0.5
Sub-Saharan Africa	6.9	5.4	3.5	5.0	-1.6	-0.7
Central and eastern Europe	5.4	3.2	-0.4	2.5	-2.6	-1.3
Commonwealth of Independent States	8.6	6.0	-0.4	2.2	-3.6	-2.3
Russia	8.1	6.2	-0.7	1.3	-4.2	-3.2
Excluding Russia	9.7	5.4	0.3	4.4	-1.3	-0.3
Developing Asia	10.6	7.8	5.5	6.9	-1.6	-1.1
China	13.0	9.0	6.7	8.0	-1.8	-1.5
India	9.3	7.3	5.1	6.5	-1.2	-0.3
ASEAN-5	6.3	5.4	2.7	4.1	-1.5	-1.3
Middle East	6.4	6.1	3.9	4.7	-1.5	-0.6
Western Hemisphere	5.7	4.6	1.1	3.0	-1.4	-1.0
Brazil	5.7	5.8	1.8	3.5	-1.2	-1.0
Mexico	3.2	1.8	-0.3	2.1	-1.2	-1.4

Source: IMF, *World Economic Outlook*, January 2009.

<sup>1</sup>The quarterly estimates and projections account for 90 percent of the world purchasing-power-parity weights.

<sup>2</sup>The quarterly estimates and projections account for approximately 76 percent of the emerging and developing economies.



# Macro and Financial Environment: A Downward Spiral

- Pernicious feedback loop between real sector (esp. housing) and financial sectors leading to decreased household wealth, consumer demand, and business confidence re: capital investment.
- Falling global demand has “led to a collapse in commodity prices” and “has reversed the commodity price boom.”
  - Oil – 2009 forecasted prices revised down to \$50 from \$68.
  - Metals, Foods – also revised downward for 2009.



# Policy Prescription – Key Ingredients

- A large global aggregate demand stimulus package to offset the collapse in private investment and consumption spending.
  - Monetary policy options in U.S. are limited
  - Emphasis on fiscal stimulus (G vs. T)
- Stabilizing housing values
- Resolving banking crisis -- crisis of confidence and massive 'bad 'loan' assets.
- Forsaking protectionism
- Mitigating the longer-term debt burden on the future growth trajectory of the global economy.

### *Economic stimulus, improved liquidity*

In addition to the steps taken in China, the latest stimulus package for the US is currently negotiating its way through the House and the Senate and is expected to become law by the end of the month. Furthermore, there are economic stimulus packages in place for most major economies—see Exhibit 3.

**Exhibit 3: Global stimulus packages**

	Stimulus package (US\$b)	2007 GDP (US\$ trillion)	% of national GDP	Interest rate (%)
US	825.0	13.8	6.0	0.25
Japan	132.0	4.4	3.0	0.10
China	586.0	3.5	16.7	5.60
Germany	65.4	3.3	2.0	2.00
UK	29.0	2.7	1.1	1.50
France	26.0	2.6	1.0	2.00
Italy	6.5	2.1	0.3	2.00
Canada	32.0	1.3	2.4	1.50
Brazil	152.0	1.3	11.7	13.80
Russia	64.0	1.3	4.9	13.00
India	8.0	1.2	0.7	5.50
South Korea	130.0	1.0	13.0	3.00
Mexico	4.4	0.9	0.5	8.30
Australia	6.7	0.8	0.8	4.30
Taiwan	14.4	0.4	3.6	1.50
<b>Average</b>			<b>4.5</b>	<b>4.29</b>

<sup>1</sup> This amount is in addition to the US\$700b bailout package approved by Congress in October 2008 for US financial institutions; the amount is also under consideration to be reduced to US\$700b for political reasons

Source: The World Bank, BBC News, CNBC News, New York Times, Bloomberg, CBC News, FX Street



## IV. Business Cycles vs. Super Cycles



# Business Cycles and Super Cycles

- Cuddington-Jerrett (2008) focus on super-cycle frequencies, but highlight the possibility that **business-cycle contractions may obscure super-cycle behavior:**
  - “The extent to which the super-cycle component differs from the total non-trend component in the lower panel reflects the importance of other shorter cycles (such as business and intermediate term cycles).”
  - “Even if one has confidence about the long-term trend and the super cycle in copper prices, the shorter cycles imply large price risks for those in the industry making long-run investment decisions.”

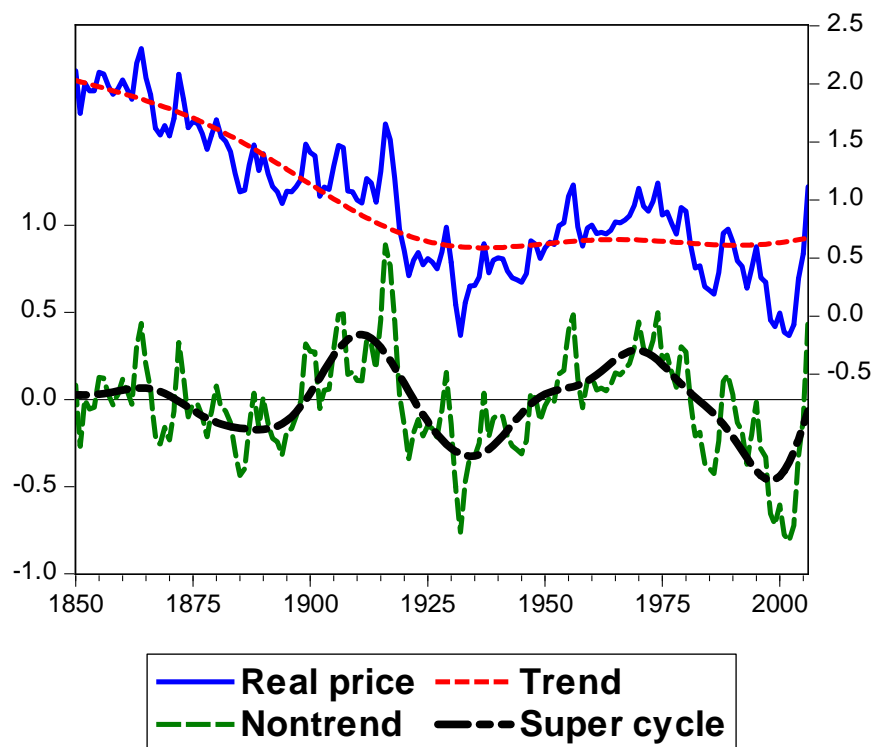


## Business Cycles and Super Cycles- cont.

- What can we learn by examining the overlay of business cycles on super cycles?
- In the lower panel of the decomposition graphs that follow, you'll see the super cycles.
  - The Difference between the total non-trend component (green) and the super cycle (black) captures short-term business cycle movements.

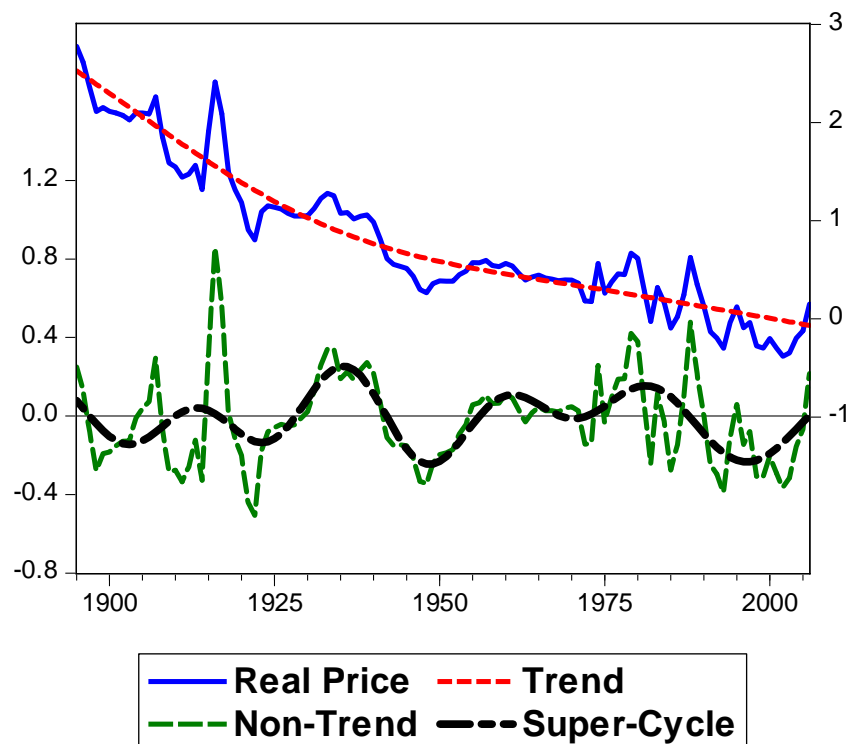
# Price Decomposition of Copper

Real Copper Price Components  
(Log scaling)



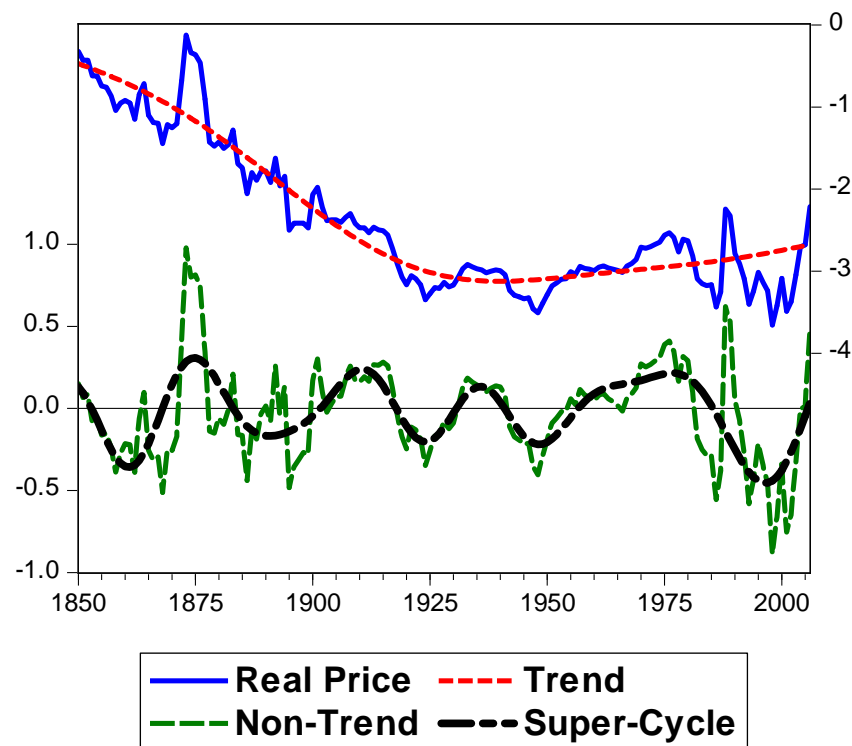
# Price Decomposition of Aluminum

Real Aluminum Price Components  
(Log Scaling)



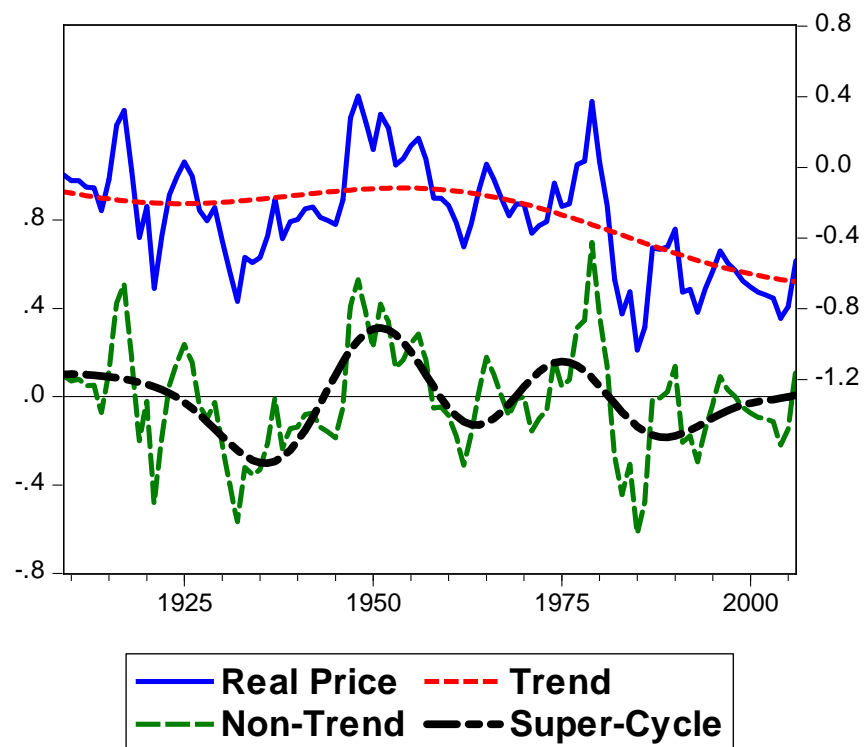
# Price Decomposition of Nickel

Real Nickel Price Components  
(Log Scaling)



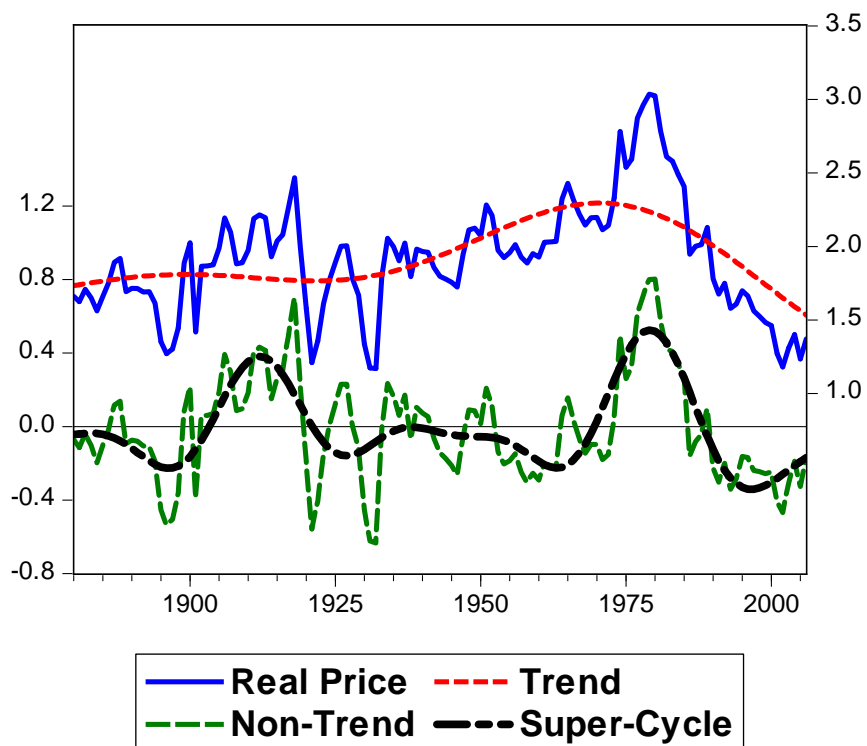
# Price Decomposition of Lead

Real Lead Price Components  
(Log Scaling)

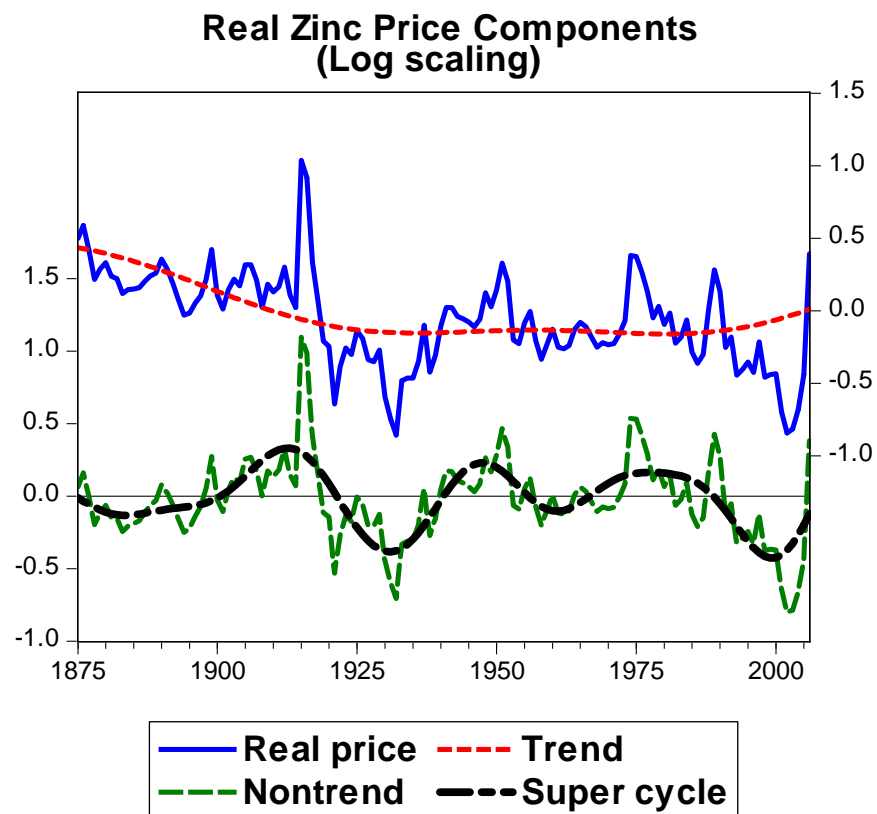


# Price Decomposition of Tin

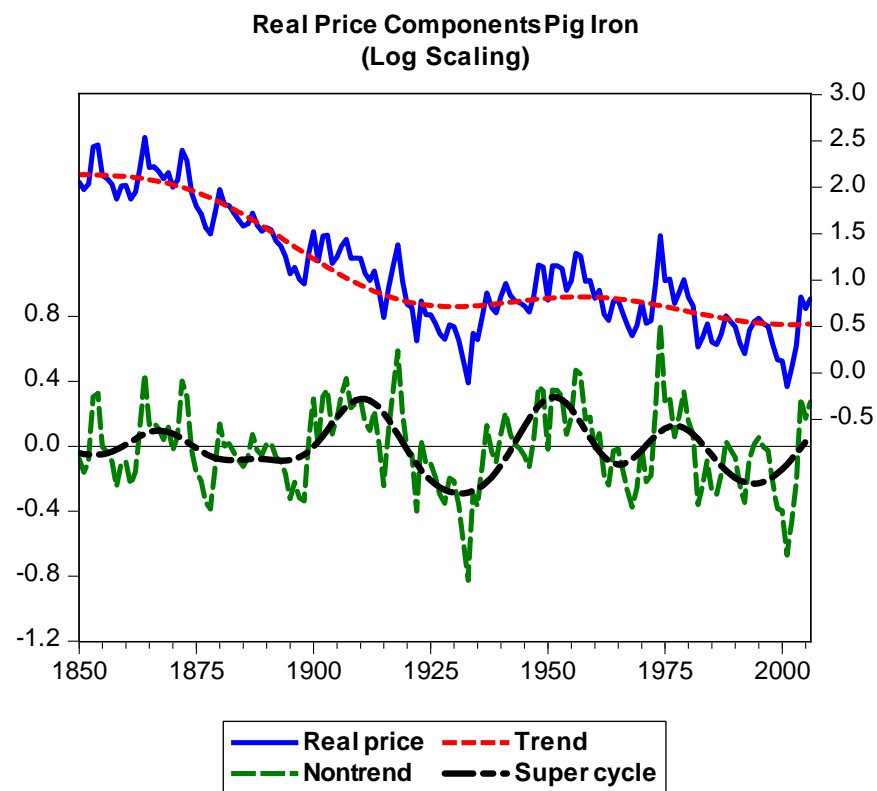
Real Tin Price Components  
(Log Scaling)



# Price Decomposition of Zinc

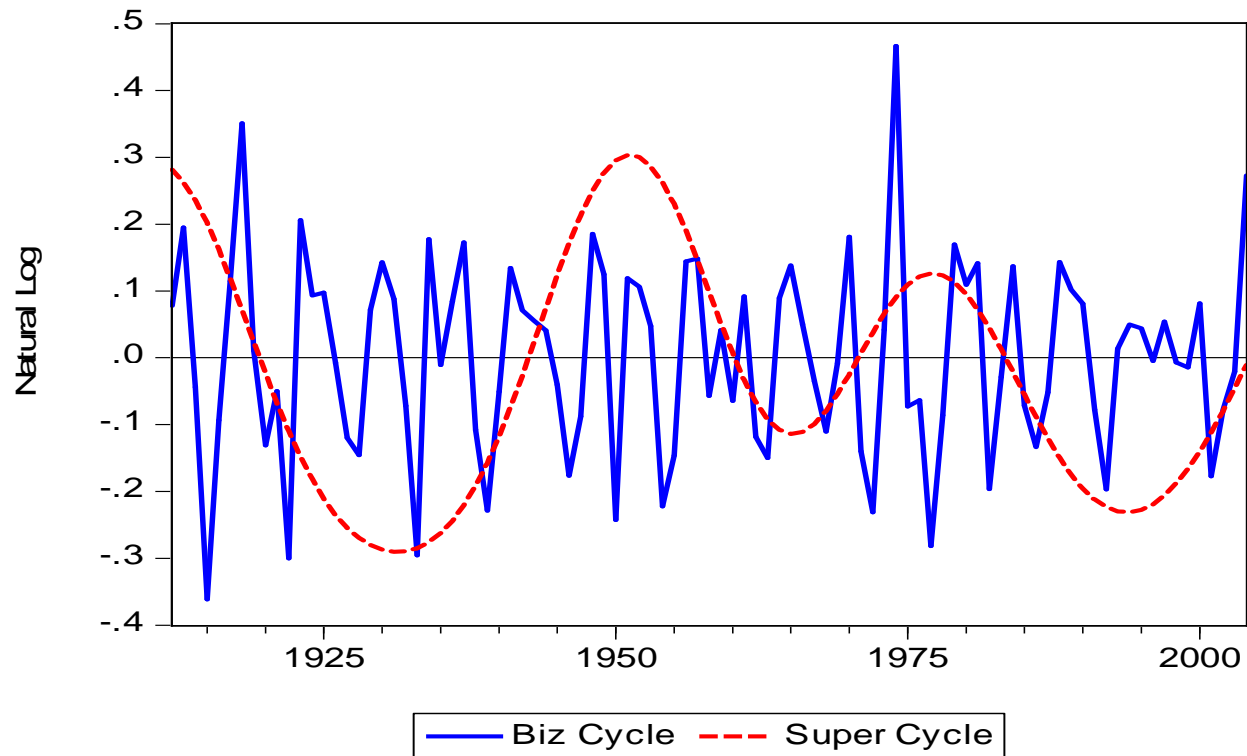


# Price Decomposition of Pig Iron



# Pig Iron Cycles

Pig Iron Biz Cycle vs. Super Cycle





## V. Implications of a Business-Cycle Downturn on Super Cycles



# Impact of Biz Cycle Downturn?

## Demand-Side Considerations

- Temporary softening of global (esp. Chinese) growth will moderate metals' demand.
  - IMF still forecasts +6.7% GDP growth for China in 2009 (even after the 1/28/09 downward revision).
- Industrial Country recession will be accompanied by sharp reduction in investment spending (construction, housing) >> reduced metal demand

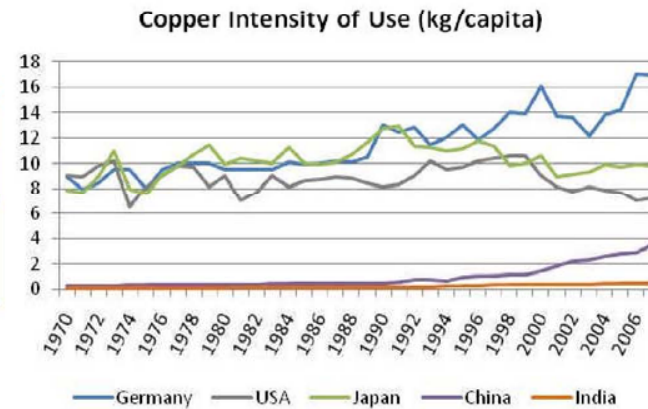
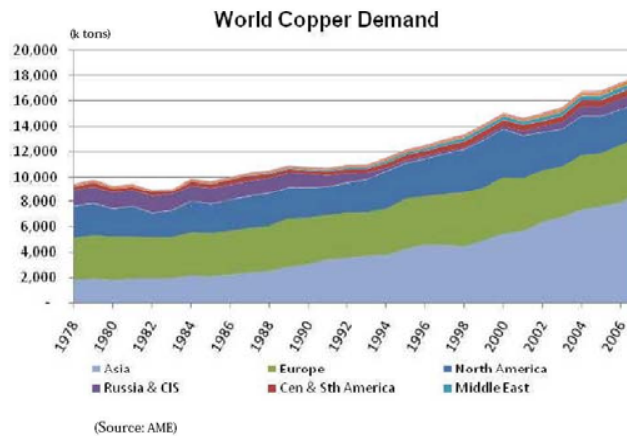


# Ross Bhappu of Denver's Resource Capital Funds

- Ross argued at a recent 40<sup>th</sup> Anniversary celebration for the Mineral Economics program at CSM that the long-term metal market fundamentals remain strong.
- Several of his PP slides follow (with thanks!)
- <http://www.resourcecapitalfunds.com>

# Mining Remains a Growth Story

- Copper demand is steadily growing and is forecast to increase to over 22Mt by 2012, a CAGR 4-5%
- Intensity of use increasing in emerging markets - driven by urbanization / infrastructure development





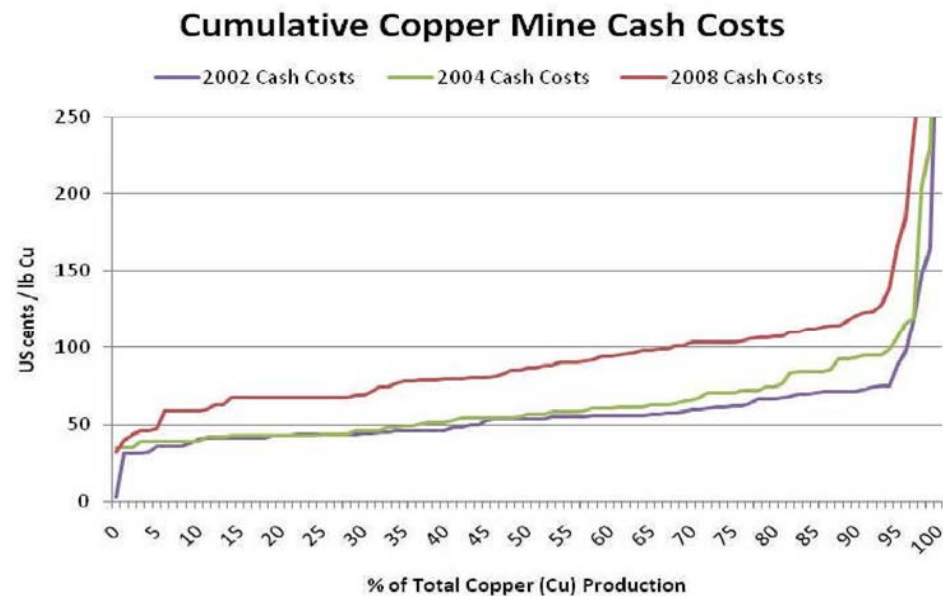
# Impact of Biz Cycle Downturn?

## Supply-Side Considerations

- Mining companies have slashed capacity expansion programs.
- Credit markets are frozen, so external sources of funding for capacity expansion is hard to come by.
- The “option value of waiting” before undertaking additional capital expansion in mining is very high, esp. given recent price retreat.
- Prices of key mining inputs will fall and availability will improve – energy input prices, tires, etc.
- Bulk transport costs and time lags have fallen (at least until very recently when Baltic Dry Freight Index began to rise again).

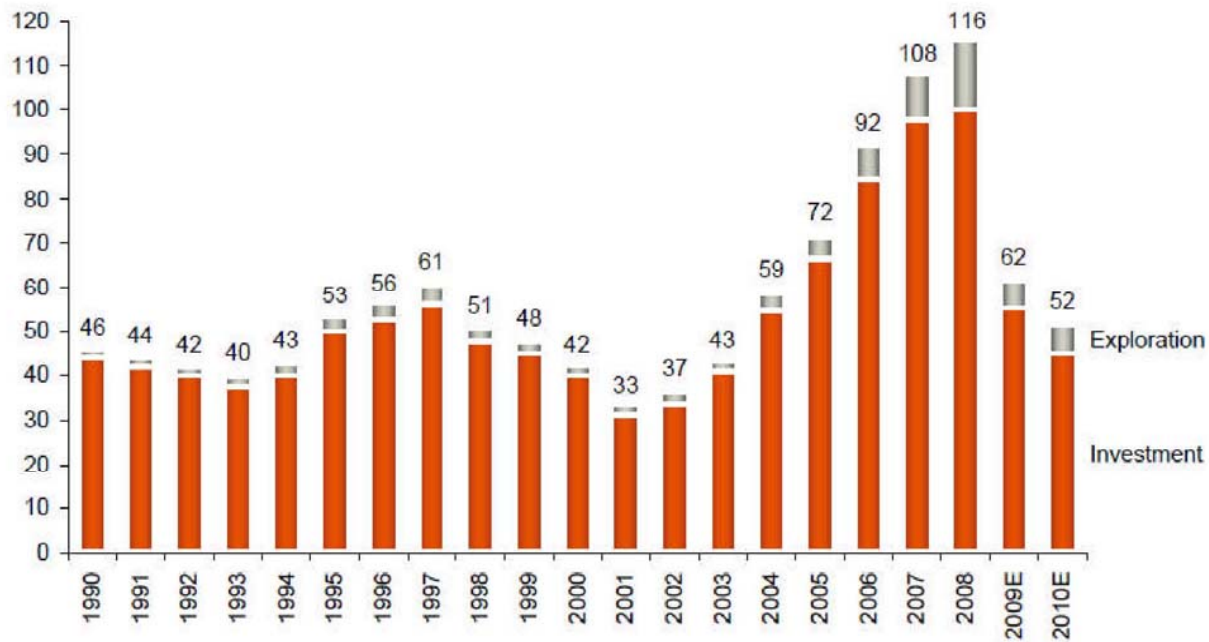
## Supply Side Constraints – Operating Costs

- ❖ Historically operating costs fell on a regular basis
  - For the first time we are seeing a dramatic cost increase



# Mining Capex to Collapse in 2009

Capital Expenditure for the Global Mining Industry  
(US\$bn)




Source: McKinsey Mining Database; RMG



## VI. Concluding Remarks

- So Long Super Cycle? We think not, but only time will tell.
- We believe the demand-side drivers for the current super cycle are still in play.
- Strong upward metal price movements over the next couple of years have probably been choked off by the global downturn, which we expect to be severe in terms of depth and duration.
- LT capacity expansion “catch up” described in Radetzki et al (*Resources Policy* 2008) is being delayed.
- When the global economy emerges from recession, supply will again be struggling to catch up with demand.



Thank you for inviting me to speak at the IPIA meetings  
again this year.

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