

## ***Strong/Dollar Weak Dollar:***

### ***A two handed economist's view on the value of the US dollar and its impact on agriculture.***

*Risk & Profit 2008*

*August 14-15*

*Paul Clark, Kara Ross, Kelly Chen*

Recently, the popular press has been full of stories about the damaging effect of the 'weak' US dollar.

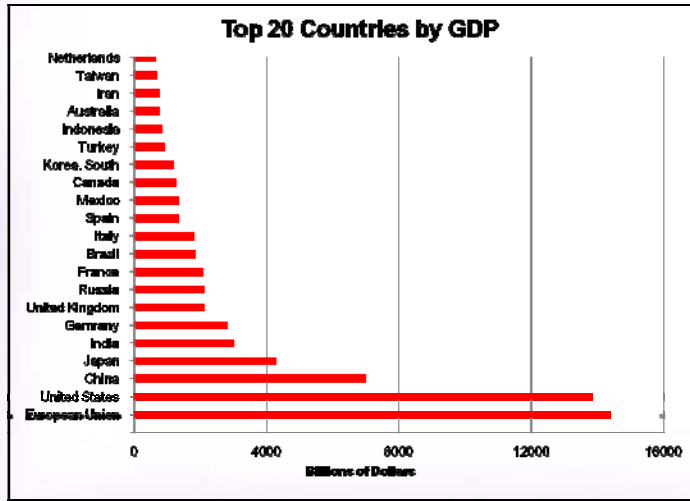
- *"A Weak Dollar is Bad for America."*  
- *Forbes*, 17 October 2007.
- *"Dissecting the Declining Dollar."*  
- *U.S. News & World Report*, 7 March 2008.
- *"The Weak Dollar Threat to World Order."*  
- *The Wall Street Journal*, 9 June 2008.
- *"Dollar's dip Signals Deep Concern."*  
- *The Wall Street Journal*, 16 July 2008.

However a short time ago, there was much hand wringing about the dollar being too 'strong.'

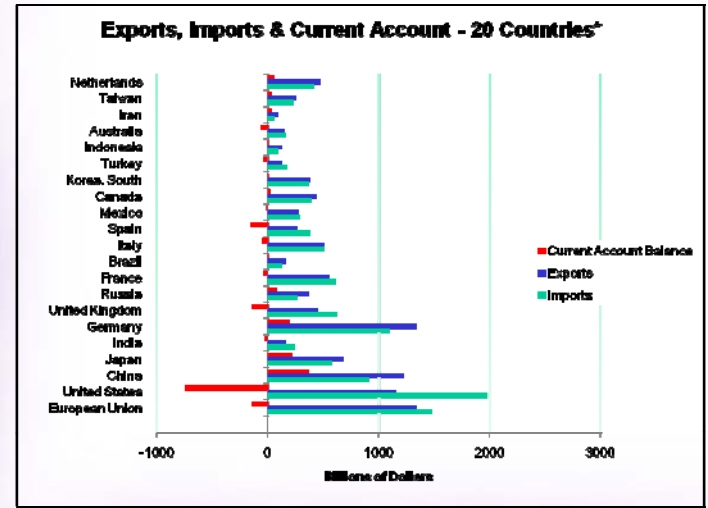
- *"Why the Dollar Isn't About to Fall."*  
- *Business Week.online*, 24 July 2001
- *"Let the Dollar Drop."*  
- *Economist.com*, 5 February 2004
- *"Strong Dollar Blues."*  
- *American Spectator*, 11 January 2006.
- *"Strong Dollar Could Cause Bigger Trade Deficit."*  
- *All Business*, 1 October 2006.

## **Presentation Outline**

- ***Putting Things into Perspective***
- ***Reviewing Foreign Exchange***
- ***Applying What We Have Learned to Ag Outputs & Inputs***



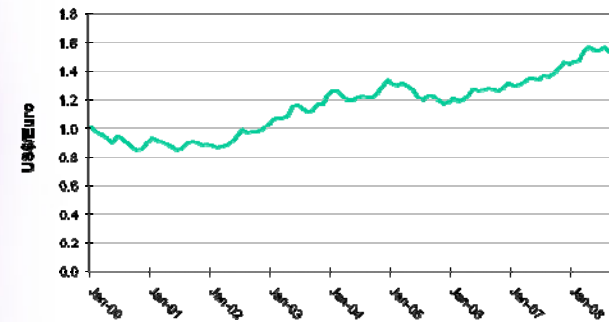
\*CIA World Factbook:  
<https://www.cia.gov/library/publications/the-world-factbook/>



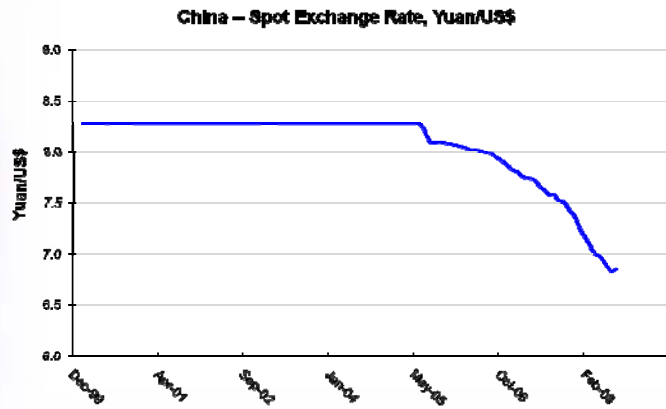
\*CIA World Factbook:  
<https://www.cia.gov/library/publications/the-world-factbook/>

	United States		China	
Population (thousands, 2006)	298,988.1		1,311,797.7	
GDP (million current PPP US\$, 2006)	13,201,819.3		10,048,026.3	
Current account balance (million US\$, 2006)	(811,490.0)		249,867.0	
Trade to GDP ratio (2004-2006)	26.0		69.0	
Rank in world trade, 2006	Exports	Imports	Exports	Imports
Merchandise (excluding intra-EU trade)	2	1	3	3
Commercial services (excluding intra-EU trade)	2	2	4	4
Merchandise exports, f.o.b. (million US\$)	1,036,634.7		968,936.0	
Merchandise imports, c.i.f. (million US\$)	1,918,076.9		791,461.0	
Share in world total exports	8.6		8.0	
By main commodity group (ITS)				
	Agricultural products	8.9	Agricultural products	3.4
	Fuels and mining products	6.8	Fuels and mining products	4.0
	Manufactures	79.8	Manufactures	92.4
By main destination				
	1. Canada	22.2	1. United States	21.0
	2. European Union (27)	20.7	2. European Union (27)	19.6
	3. Mexico	12.9	3. Hong Kong, China	16.0
	4. Japan	5.8	4. Japan	9.5
Share in world total imports	15.4		6.4	
By main commodity group (ITS)				
	Agricultural products	5.4	Agricultural products	6.5
	Fuels and mining products	20.7	Fuels and mining products	20.0
	Manufactures	70.3	Manufactures	73.2
By main destination				
	1. European Union (27)	17.8	1. Japan	14.6
	2. Canada	16.0	2. European Union (27)	11.5
	3. China	15.9	3. Korea, Republic of	11.3
	4. Mexico	10.4	4. Taipei, Chinese	11.0

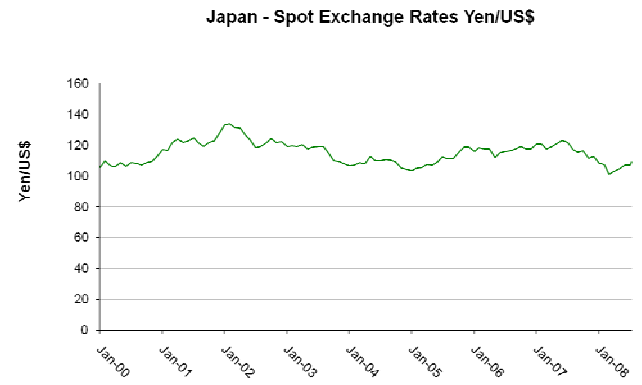
Euro Area - Spot Exchange Rate - US\$/Euro



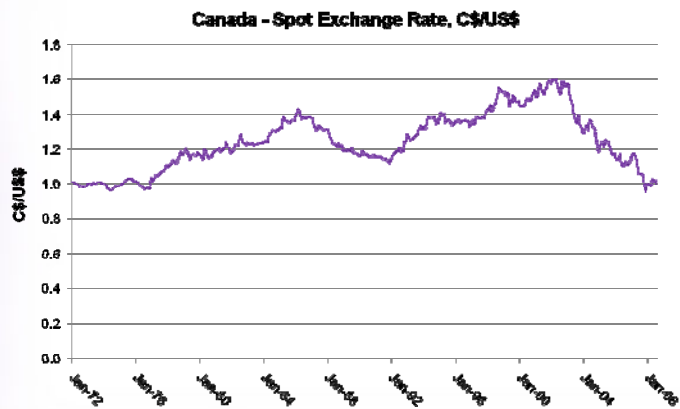
Source: U.S. Federal Reserve



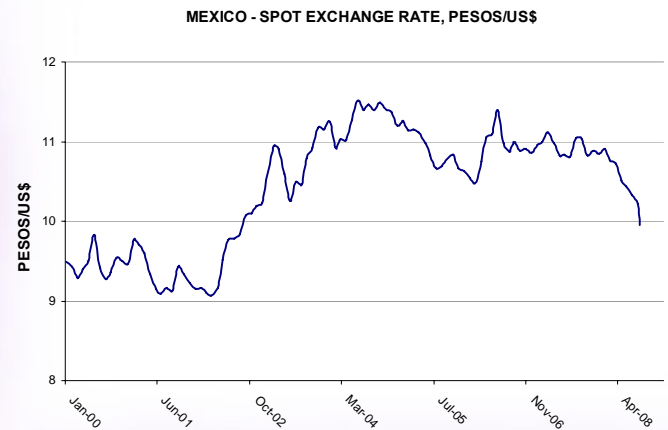
Source: U.S. Federal Reserve



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## Exchange Rate

The exchange rate ( $k$ ) is simply the price of one currency in terms of another.

For example, currently one US dollar (\$) is equal to about ten Mexican pesos (M\$) or  $M\$1 = \$0.10$ .

So, the exchange rate for \$1 in terms of the peso is M\$10 or it takes M\$10 to buy \$1.

*Note: Most foreign exchange rates are expressed in \$ terms – M\$/\$, ¥/\$, C\$/\$, etc. A couple of important exceptions are the Euro (€) and the British Pound Sterling (£) –  $k_{\$/\text{€}}$  and  $k_{\$/\text{£}}$ .*

## Definitions

The dollar is said to depreciate, or weaken against another currency when, for example, one dollar buys less units of a foreign currency.

The dollar appreciates, or strengthens when one dollar buys more units of a foreign currency.

## Exchange Rate Relationships

➤  $k$  is a multiplicative relationship:

If  $k$  increases by 10 percent, then the price of foreign currency increases by 10 percent

If  $k$  decreases by 10 percent, then the price of foreign currency decreases by 10 percent.

## Relationships (con't)

➤  $k$  is also an inverse one:

- appreciation of dollar = depreciation of foreign currency

- depreciation of dollar = appreciation of foreign currency.

## Relationships (con't)

- $k_{us} \downarrow$  (depreciates/weakens)  
M\$11/\$1 → M\$10/\$1
- $k_{us} \uparrow$  (appreciates/strengthens)  
M\$10/\$1 → M\$11/\$1,

Of course it is the opposite for the other currency:

- $k_{mex} \uparrow$   
\$0.10/M\$1 → \$0.11/M\$1,
- $k_{mex} \downarrow$   
\$0.11/C\$1 → \$0.10/M\$1

## Implications for Changes in Exchange Rate

- Changes in the exchange rate affects the volume and value of a country's imports and exports.
- All else equal, a depreciation of a country's currency makes its goods cheaper for foreigners, while all else equal, an appreciation of a country's currency makes its goods more expensive for foreigners.

## Who's Affected?

- A country's export sector benefits from a depreciating currency since foreign demand increases as those goods become relatively less expensive. The import sector suffers because the relative price of foreign goods goes up.

## Weakening Dollar\*

Advantages	Disadvantages
US firms more competitive in foreign markets	Prices for imported goods are higher
Easier for US firms to raise prices	Higher prices for imports contribute to inflation
Cheaper for foreign tourists to visit US	More expensive for US citizens to travel abroad
US capital markets more attractive to foreign investors	Harder for US firms and investors to expand into foreign markets

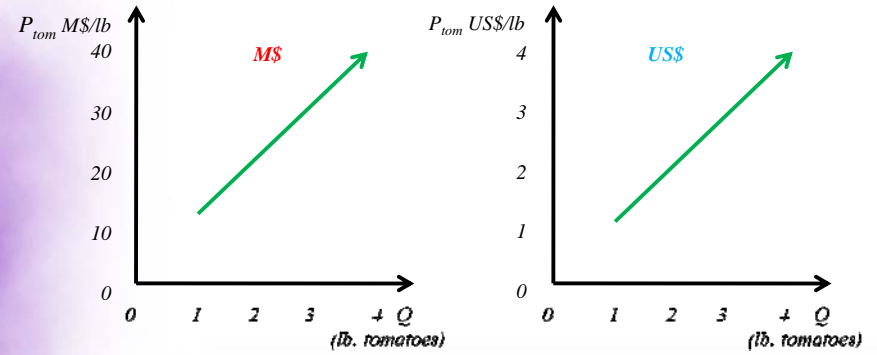
\*Federal Reserve Bank of Chicago, "Strong Dollar, Weak Dollar."

### Strengthening Dollar\*

Advantages	Disadvantages
Lower prices for imported goods	US firms at a price disadvantage in foreign markets
Lower prices of imported goods helps keep inflation low	US firms must compete with lower priced foreign goods
Cheaper for US citizens to travel abroad	More expensive for foreign tourists to visit the US
US investors can purchase foreign assets at lower price	Foreign investors less likely to provide capital to US market

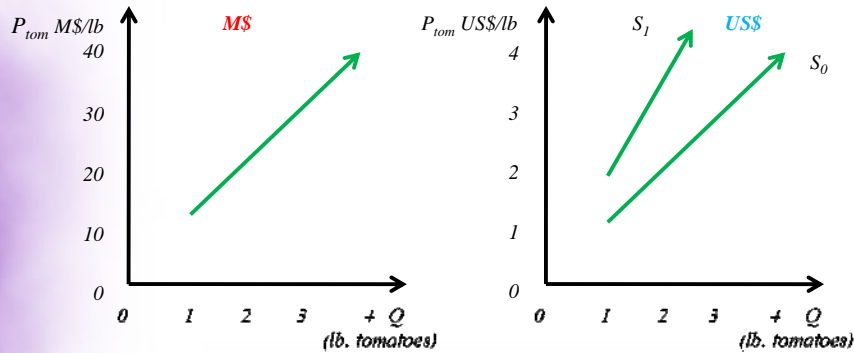
\*Federal Reserve Bank of Chicago, "Strong Dollar, Weak Dollar."

### Mexican Tomato Supply Curve\*



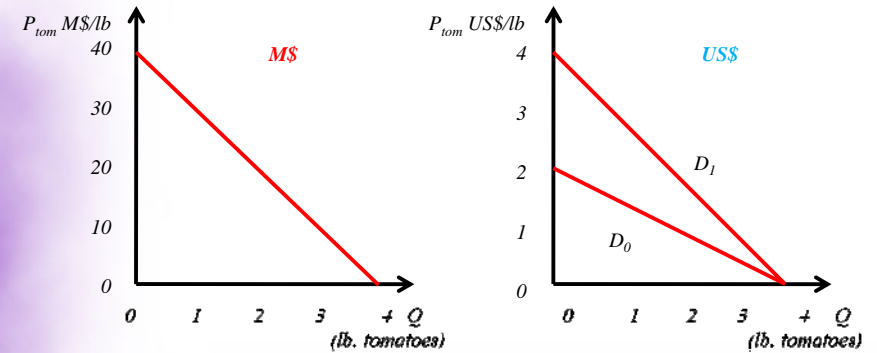
\* $k = M\$10/\$1$

### Peso Appreciation\*



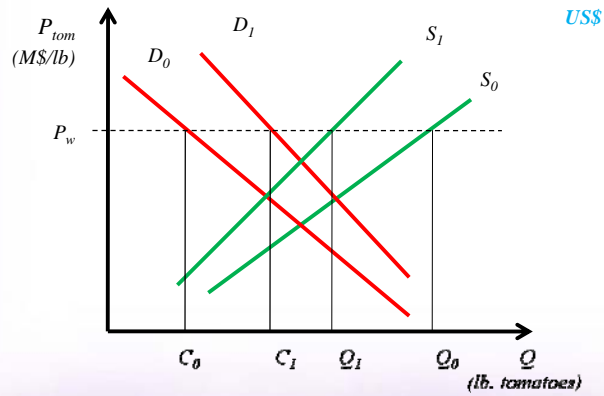
\* $k_0 = M\$10/\$1 \rightarrow k_1 = M\$5/\$1$

### Peso Appreciation\*

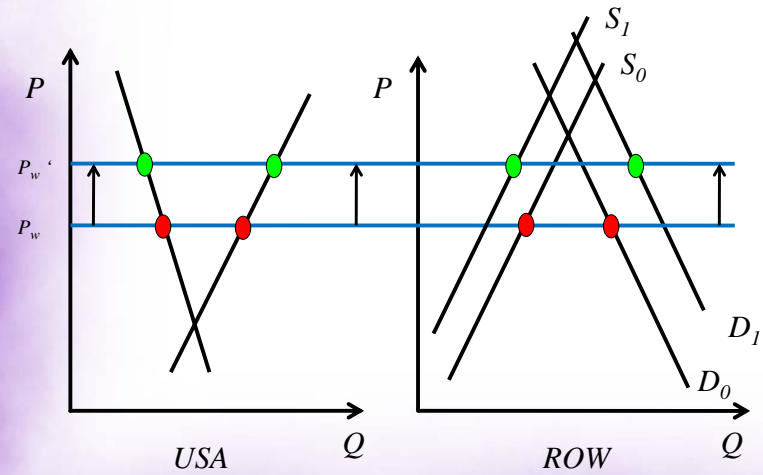


\* $k_0 = M\$10/\$1 \rightarrow k_1 = M\$5/\$1$

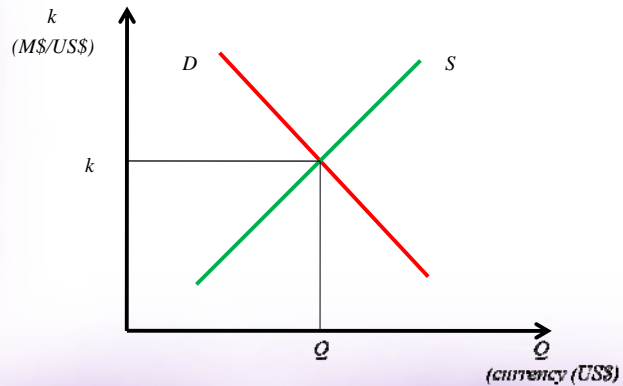
### Peso Appreciation



### Peso Appreciation = Dollar Depreciation



Like any other commodity,  $k$  is determined in a supply/demand system



System is driven by expected return on assets denominated in \$.

- Stocks and Bonds
- Capital Assets
- US government securities
- Beer Companies

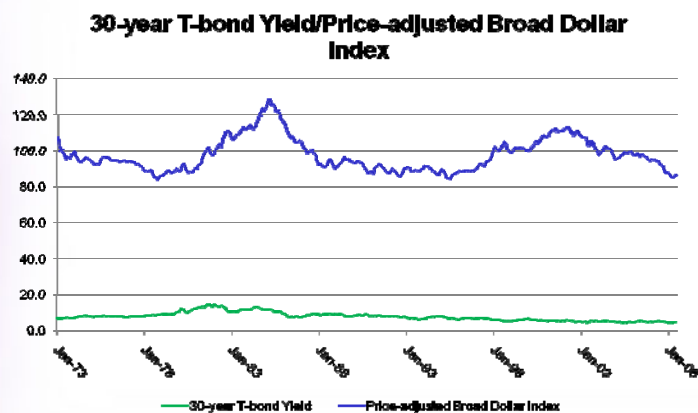
## Interest Rates Determined by: The Fisher Equation

- $i = r + \Pi$ 
  - $i$  = nominal interest rate
  - $r$  = real interest rate
  - $\Pi$  = inflation rate

Arbitrage occurs between real interest rates,  
not nominal interest rates.

## International Fischer Equation

- $i_{US} = i_{FOR} - e(\Delta k)$
- Investment decisions depend crucially on exchange rates expected to prevail in the future.



Source: Commodity Research Bureau

## Determining Exchange Rates

- Determined in the Foreign Exchange Market (FX)
- \$4 Trillion DAILY turnover
- World trade – \$27.9 trillion for 2007

## Factors Contributing to a Weak Currency\*

- Lower interest rates in home country than abroad
- Higher rates of inflation
- A domestic trade deficit relative to other countries
- A consistent government surplus
- Relative political/military stability in other countries
- A collapsing domestic financial market
- Weak domestic economy relative to foreign economies
- Frequent or recent default on government debt
- Monetary policy that frequently changes objectives

\*Federal Reserve Bank of Chicago, "Strong Dollar, Weak Dollar."

## Factors Contributing to a Strong Currency\*

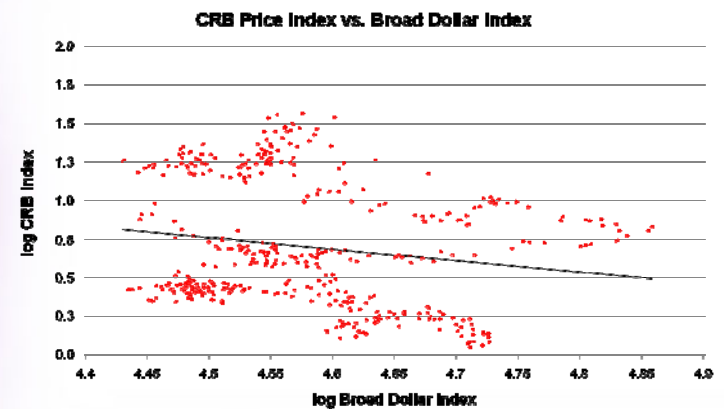
- Higher interest rates in home country than abroad
- Lower rates of inflation
- Domestic trade surplus relative to other countries
- A large, consistent government deficit crowding out domestic investment
- Political or military unrest in other countries
- A strong domestic financial market
- Strong domestic economy relative to foreign economies
- No record of default on government debt
- Sound monetary policy aimed at price stability

\*Federal Reserve Bank of Chicago, "Strong Dollar, Weak Dollar."

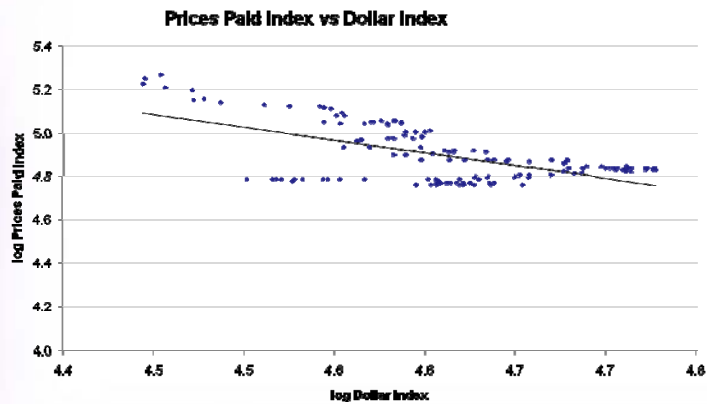
## Applying What We Have Learned

➤ Original question:

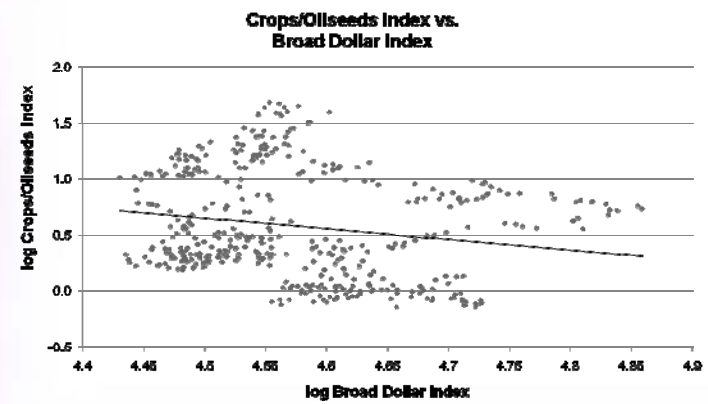
"How do changes in the exchange rate affect agriculture?"



Source: Commodity Research Bureau, U.S. Federal Reserve



Source: USDA-NASS, U.S. Federal Reserve



Source: Commodity Research Bureau, U.S. Federal Reserve

### Regression of log of real commodity price index on log broad dollar index

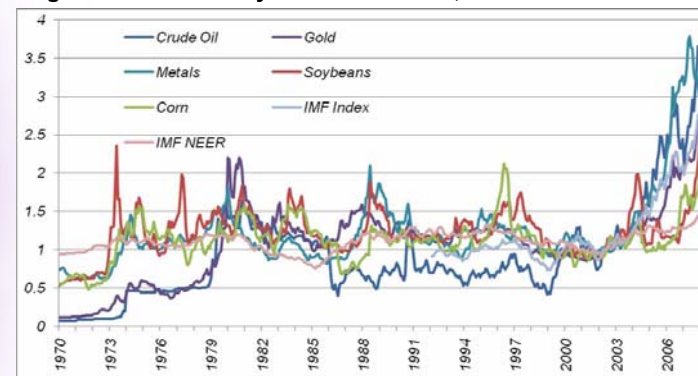
Index	Coefficient	Adj. R-Sq	Standard Error	Significant @ 5%
CRB	-0.040312668*	0.027938941	0.090197153	*
Rueters				
Crop/Oilseed	-0.941782473*	0.030554262	0.468362409	*
Prices Paid	-0.1.17050681*	0.365056838	0.10360318	*
Frankel/CRB	-.060**		0.024	*

\* log/log regression

\*\*log of CRB only

### Some Parallel Research:

Figure 16. Commodity Prices & Indices, 1970-2008\*



Source: International Monetary Fund, International Financial Statistics.

\* Commodity prices and indices are normalized to equal 1.0, on average, for 2002.

➤ Abbott, Hurt, and Tyner, 2008. "What's Driving Food Prices?" pg 31.

➤ <http://farmfoundation.org/news/templates/template.aspx?articleid=404&zoneid=26>

## More Research

### Log Real Commodity Prices and Interest Rates

sample: 1950-2005 (56 annual observations)

real interest rate in % and real commodity prices in log units

	Coefficient	Std error	sig. 5%
Goldman Sachs (1969-)	-0.080	0.029	*
Dow Jones	-0.070	0.023	*
CRB	-0.060	0.024	*
Moody's	-0.058	0.014	*
Reuters (1959-)	-0.009	0.024	
COMMODITIES (by coefficient in ascending order)			
Sugar	-0.144	0.035	*
Soy bean oil	-0.096	0.030	*
Corn	-0.091	0.032	*
Rubber	-0.090	0.037	*
Wheat	-0.088	0.033	*
Lead	-0.071	0.022	*
Oats	-0.066	0.029	*
Soy beans	-0.064	0.027	*
Cocoa	-0.063	0.035	*
Cotton	-0.061	0.030	*
Zinc	-0.050	0.018	*
Cattle	-0.048	0.016	*

➤ Frankel, 2006. "The Effect of Monetary policy on Real Commodity Prices."

➤ <http://ksghome.harvard.edu/~jfrankel/CP.htm>

## Review

➤ **A exchange rate is simply the price of a country's currency in terms of another**

➤ **There are winners and losers when a currency strengthens or weakens:**

**-With a 'weak' currency - export industries 'gain' while import industries 'lose'.**

**-The opposite is true with a 'strong' currency.**

**-Generally agricultural commodities – thus ag in general gain from a 'weak' currency.**

**- Consumers of imported goods 'lose'**

# Questions?

## Thank you!