Historical Analysis of Real Global Price of Oil: Implications for Future Prices

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Preface to AAPG datapages - 2007

Today, oil prices are at record highs and the value of the US dollar on global currency markets is reaching historic lows. Some analysts have suggested a connection.

This paper shows that throughout OPEC's history, OPEC has frequently offset a low US dollar by raising nominal prices to maintain purchasing power parity.

The key concepts of this paper were first presented at the AAPG national meeting in 1996 in San Diego. An up-dated version of this paper was presented at the AAPG national meeting in 2000 in New Orleans.

This is the original, 2000 presentation. Word slides and annotations on the graphs have been added to clarify spoken points, taken verbatim from my notes.

Introduction - AAPG, 2000

"The Real Global Price of oil is the price of oil corrected for inflation and for exchange-rate fluctuations of the U.S. dollar on global currency markets. Exchange rates, and the Real Global Price of oil, are important because OPEC sells oil for U.S. dollars, and then uses those dollars to buy German pharmaceuticals and Japanese cars.

So, for example, if the U.S. dollar falls 20% relative to the German mark, then the price of those German pharmaceuticals goes up by 20%. OPEC can, and has in the past, lost purchasing power by virtue of an eroding dollar and responded with higher prices.

"OPEC countries, excluding Indonesia, get 75 to 90% of their income from the sale of oil. Changes in the value of the dollar have a real impact on OPEC's purchasing power, and their economies.

"Therefore, the Real Global Price of oil is a better measure of the true price of oil, because it measures oil's *value* relative to those who set the price - namely OPEC."

Introduction - AAPG, 2000

"Marathon's management requires I make this disclaimer: The opinions and analyses presented herein are entirely the author's and do not represent Marathon Oil Company's analyses, opinions, forecasts - or anything else. So this presentation does not reveal the secret, inner workings of Marathon's oil price predictions."

Outline of Talk

- Introduction
- Real Global Price of Oil
  - Historical Retrospective
- Commodity Analysis
- “Futurology”
- Conclusions

“This is the outline I will follow. Let’s start with the introduction”

Two oil price curves (next 2 slides)

"Two oil prices are commonly reported: 'Nominal' and 'Real'

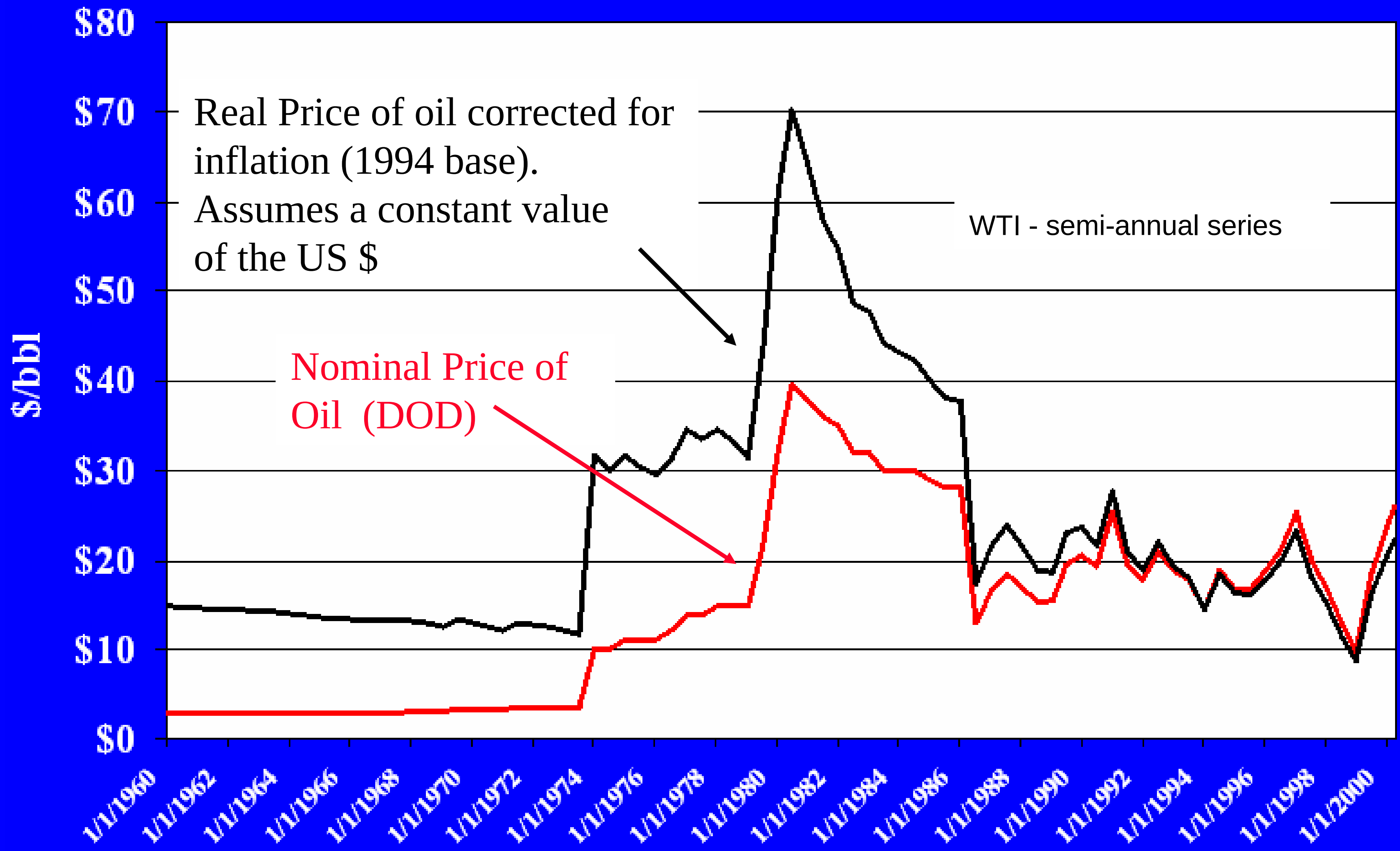
- The 'Nominal Price' is also called the price in dollars of the day (DOD). It is not corrected for anything.
- The 'Real Price' is the price corrected for inflation, usually using the American Consumer Price Index. Also referred to as 'in real terms.'

"Many experts *[circa 2000]* have made grave prognostications about future oil prices based on analysis of the data series for the 'Real Price' going back to 1900. They say, 'corrected for inflation, over the last 70 years, the price of oil has averaged about $13/bbl.'

"But 'Real Price' analyses are flawed because they only measure of the price of oil relative to the American Consumer.

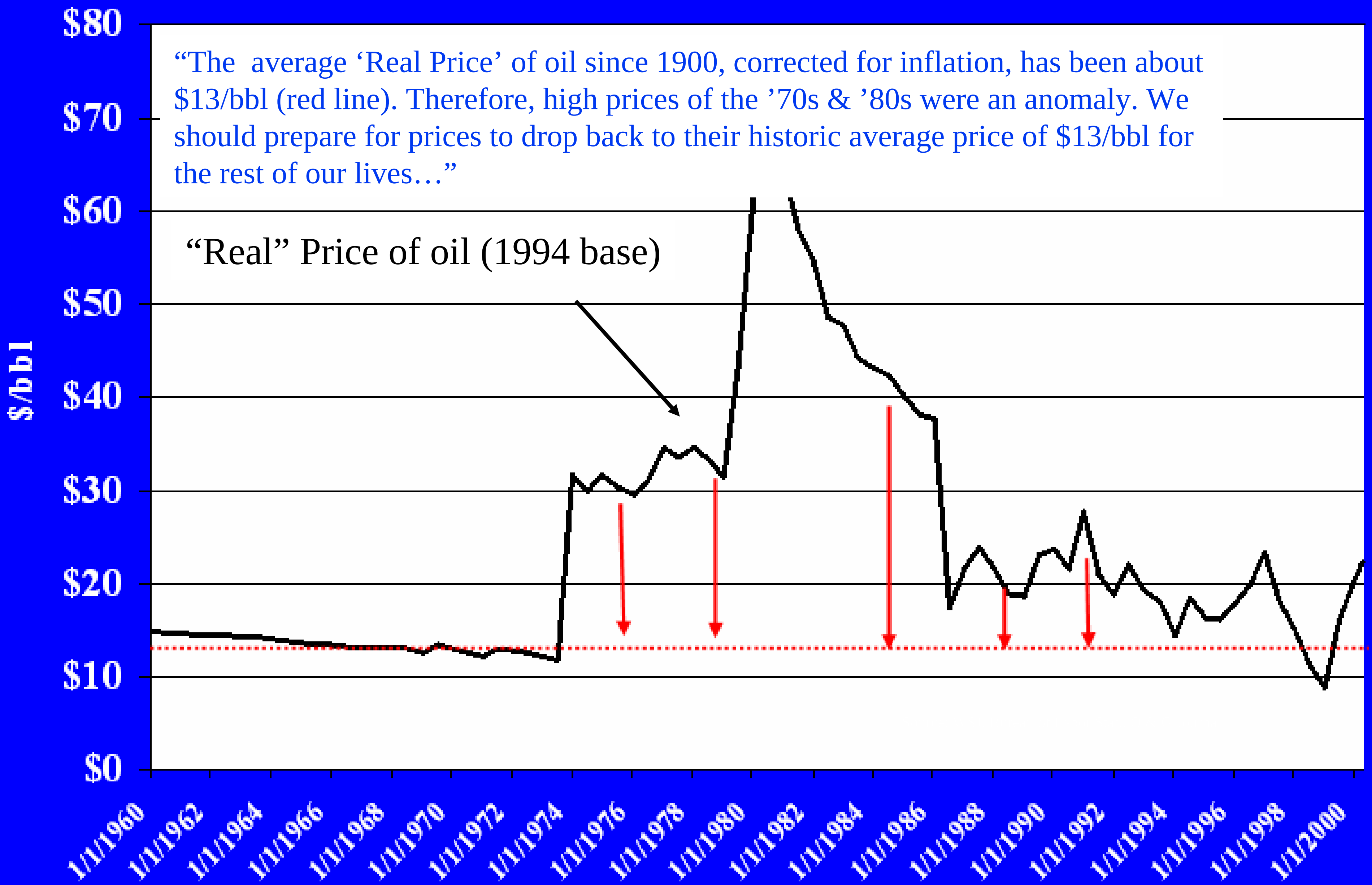
"So my question to the audience is, 'Does the American consumer set the price of oil?'"

Nominal and Real Price of Oil

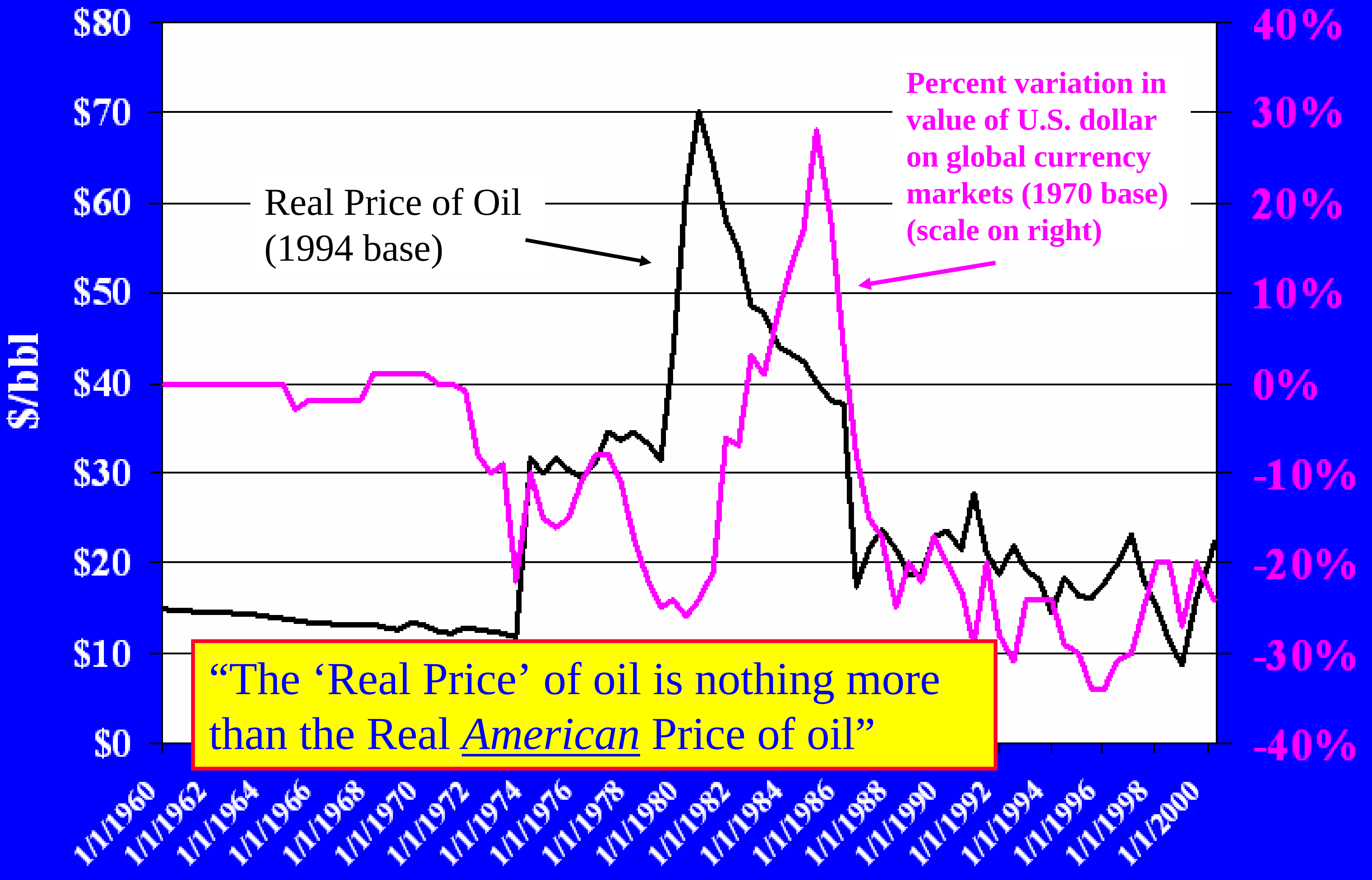


Data Sources: IMF, WSJ, Fed. Reserve Bank of Dallas, O & G Journal

Common "analysis" of real price data



The fallacy of "Real Price" analyses is that the *value* of the U.S. dollar has not been constant.



“A better measure of the price of oil is the price relative to the people who control oil production and price; which is OPEC and not the American consumer. And this means looking at oil from a global perspective: the Real Global Price.”

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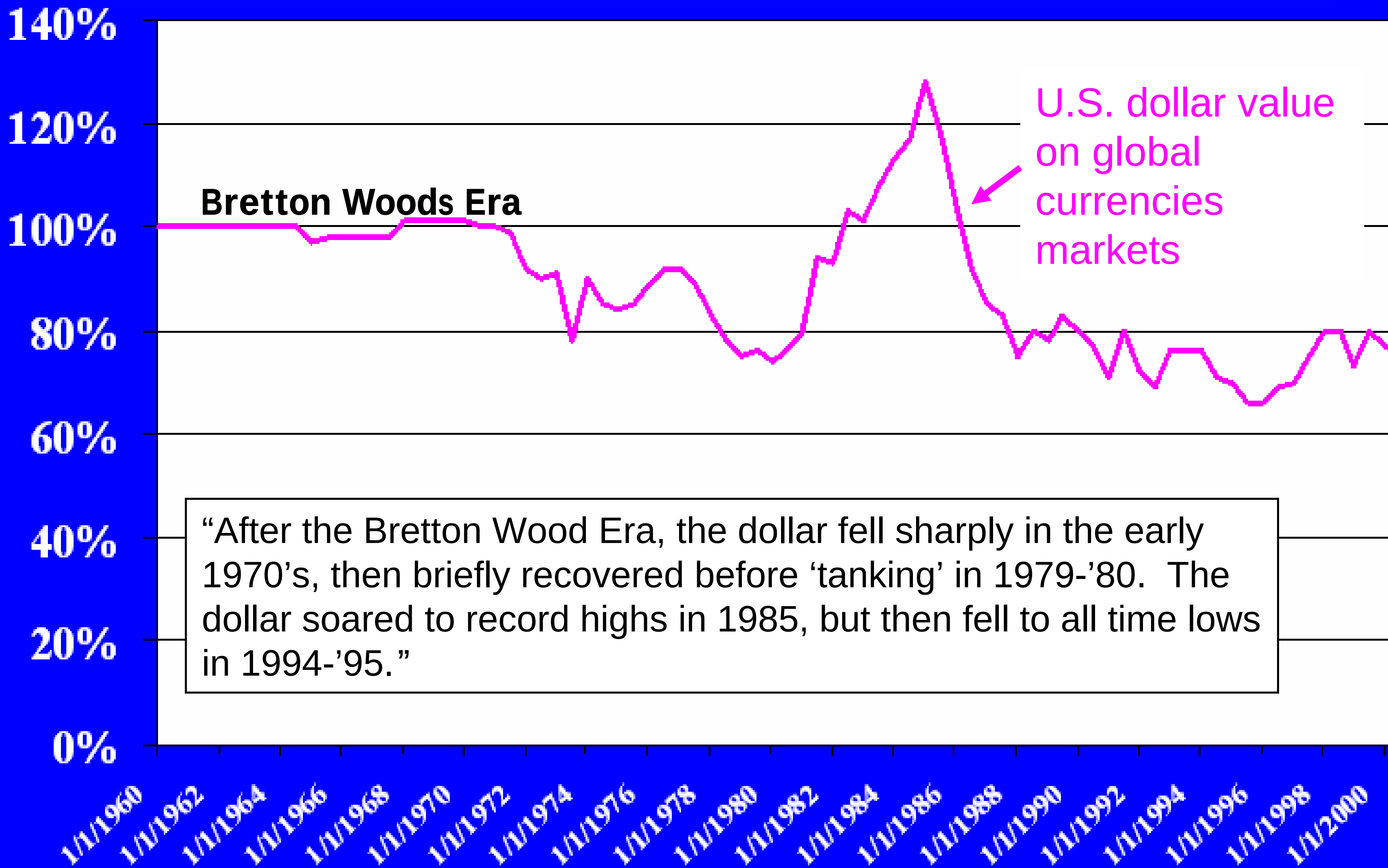
"I'll calculate the Real Global Price (RGP) of oil. Then I will present an outline of the important events over the last 40 years, the OPEC era."

Value of the dollar

"First, we have to establish just what the value of the U.S. dollar has been over the OPEC era of the last 40 years. For that, I use the value of the dollar relative to the G-7 currencies plus Switzerland. The reference basket is weighted with respect to the individual countries GDP. Note: there are many different methods to calculate the value of the U.S. dollar but all the different methods give about the same results."

Value of U.S. dollar (1970 base = 100%)



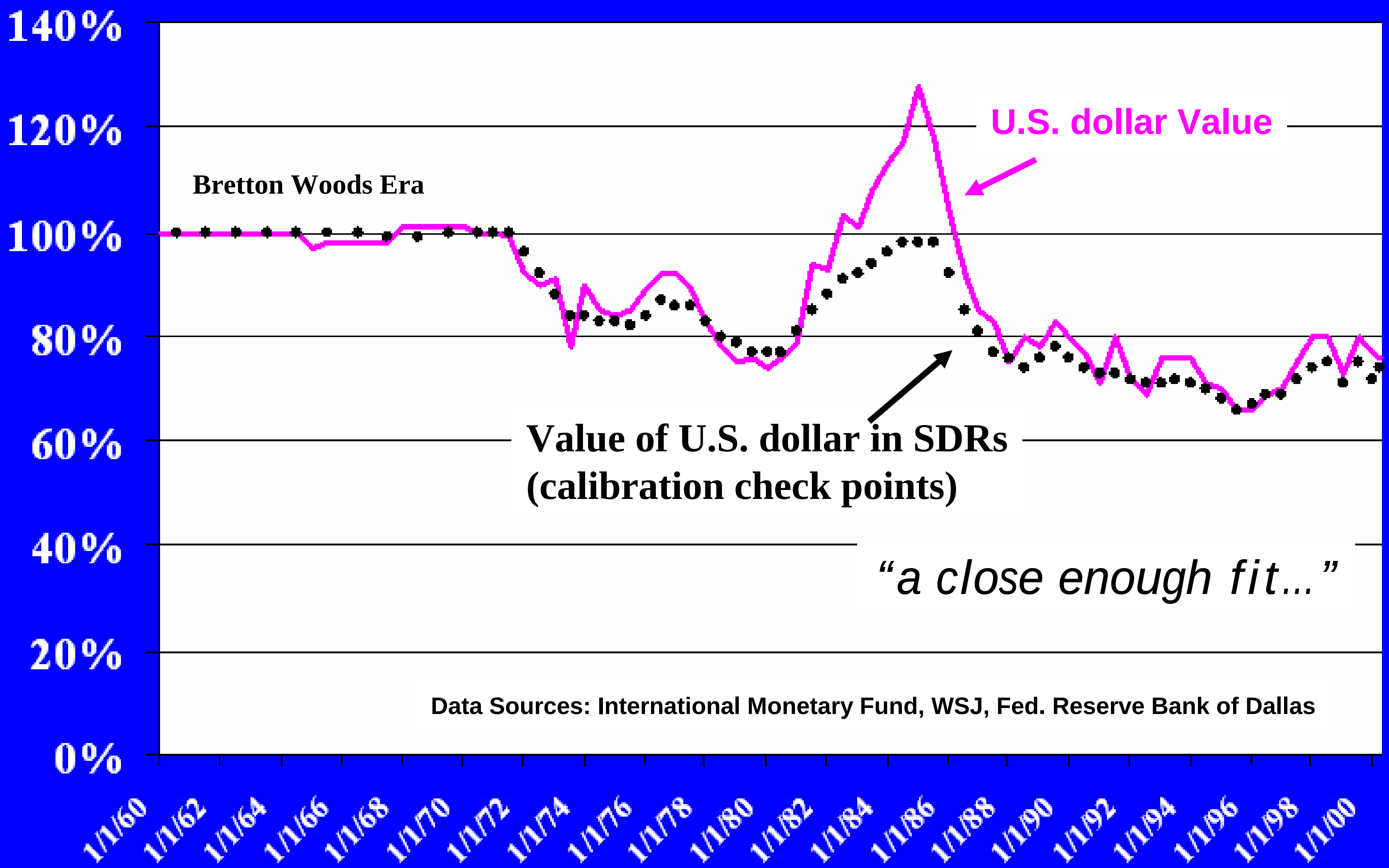
Data sources: WSJ, Fed. Reserve Bank of Dallas

Is the math right?

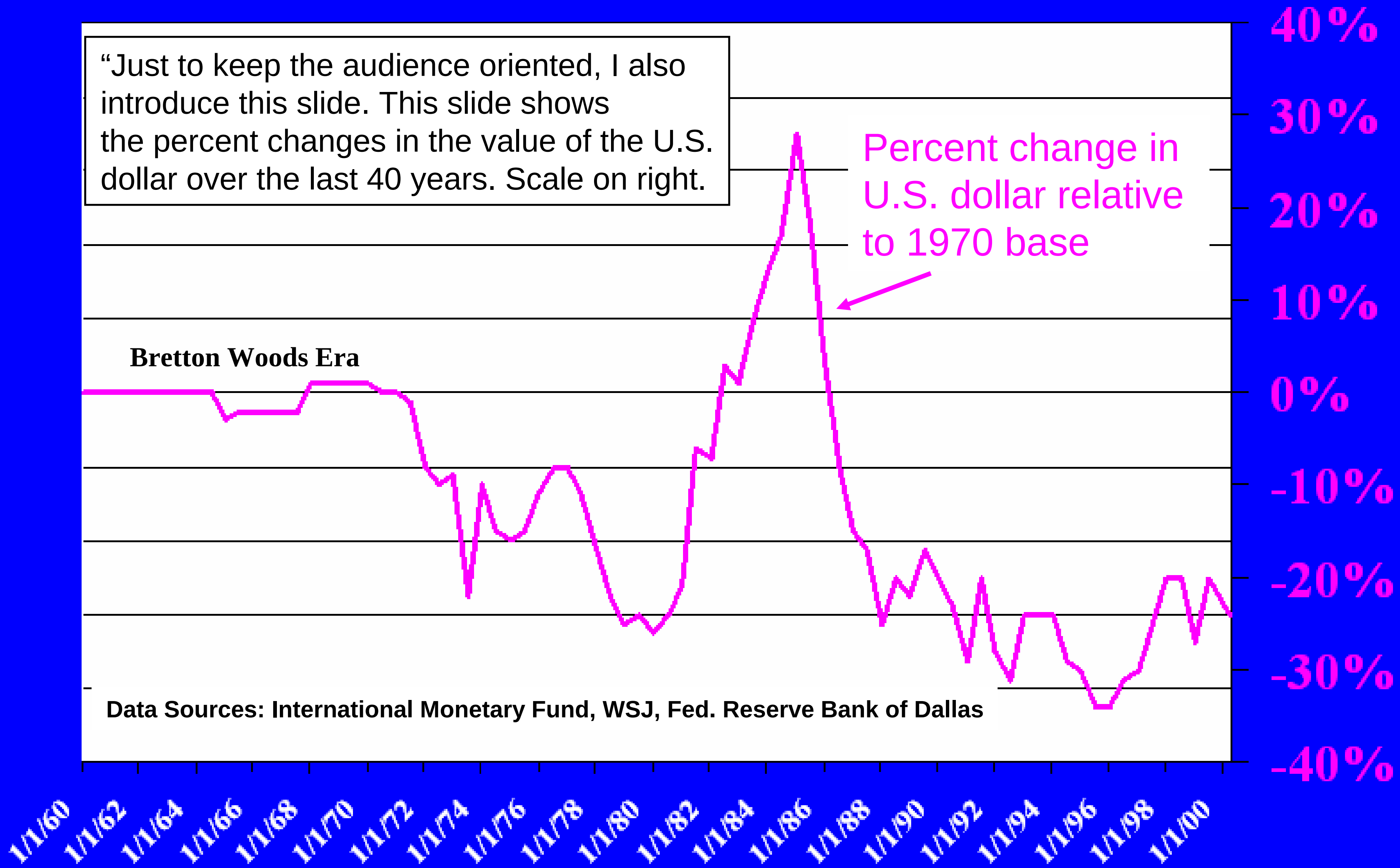
"As a calibration, on the next slide I show the value of the U.S. dollar as calculated by the International Monetary Fund (IMF), and expressed in Special Drawing Rights (SDRs), the pseudo-currency of the IMF."

"I might have used the IMF's SDRs as a proxy for the U.S. dollar's value, but I did not for two reasons. First, I think most of the audience is intuitively familiar with exchange rate fluctuations between the U.S. dollar and, for example, the English Pound - not many people have heard of SDRs. Second, the IMF is loath to increase the value of the U.S. dollar above its original valuation, even when global currency markets actually pushed the dollar to record highs. For example, in 1985, the greenback soared. One US dollar could briefly buy one British pound. At that time, the IMF 'capped' the dollar's value."

Value of U.S. dollar relative to SDRs



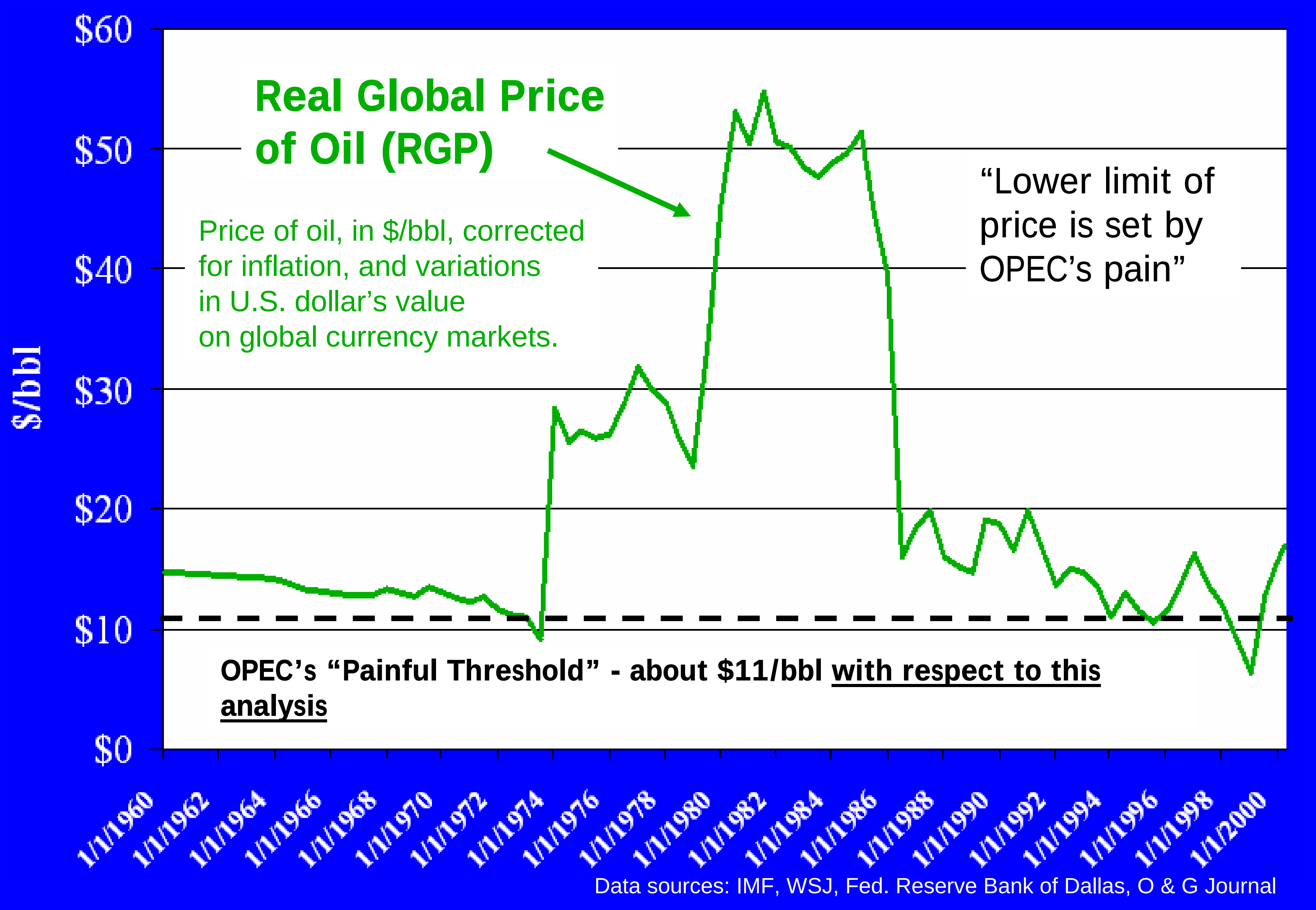
Percent changes from 1970 base



Real Global Price

"To correct for inflation, I used the GDP deflator for the reference basket of currencies, but, interestingly, the U.S. P.P.I. would have given the almost exactly the same results.

"The next slide is the Real Global Price of oil, corrected for exchange-rate fluctuations and for inflation."


Real Global Price
of Oil (RGP)
Price of oil, in $/bbl, corrected
for inflation, and variations
in U.S. dollar's value
on global currency markets.
"Lower limit of
price is set by
OPEC's pain"
OPEC's "Painful Threshold" - about $11/bbl with respect to this analysis
$/bbl
$60
$50
$40
$30
$20
$10
$0
1/1/1960
1/1/1962
1/1/1964
1/1/1966
1/1/1968
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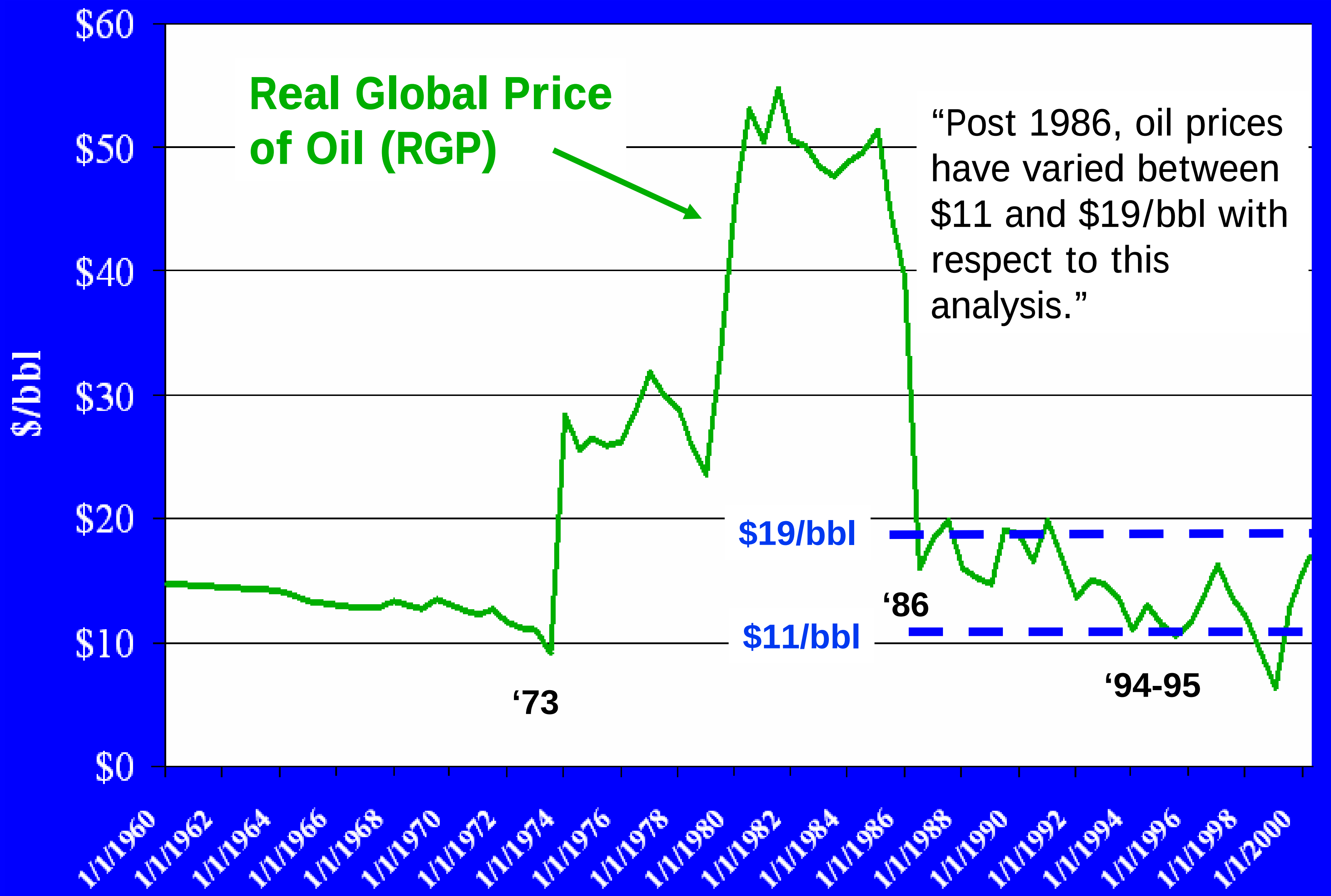
1/1/2000
Data sources: IMF, WSJ, Fed. Reserve Bank of Dallas, O & G Journal



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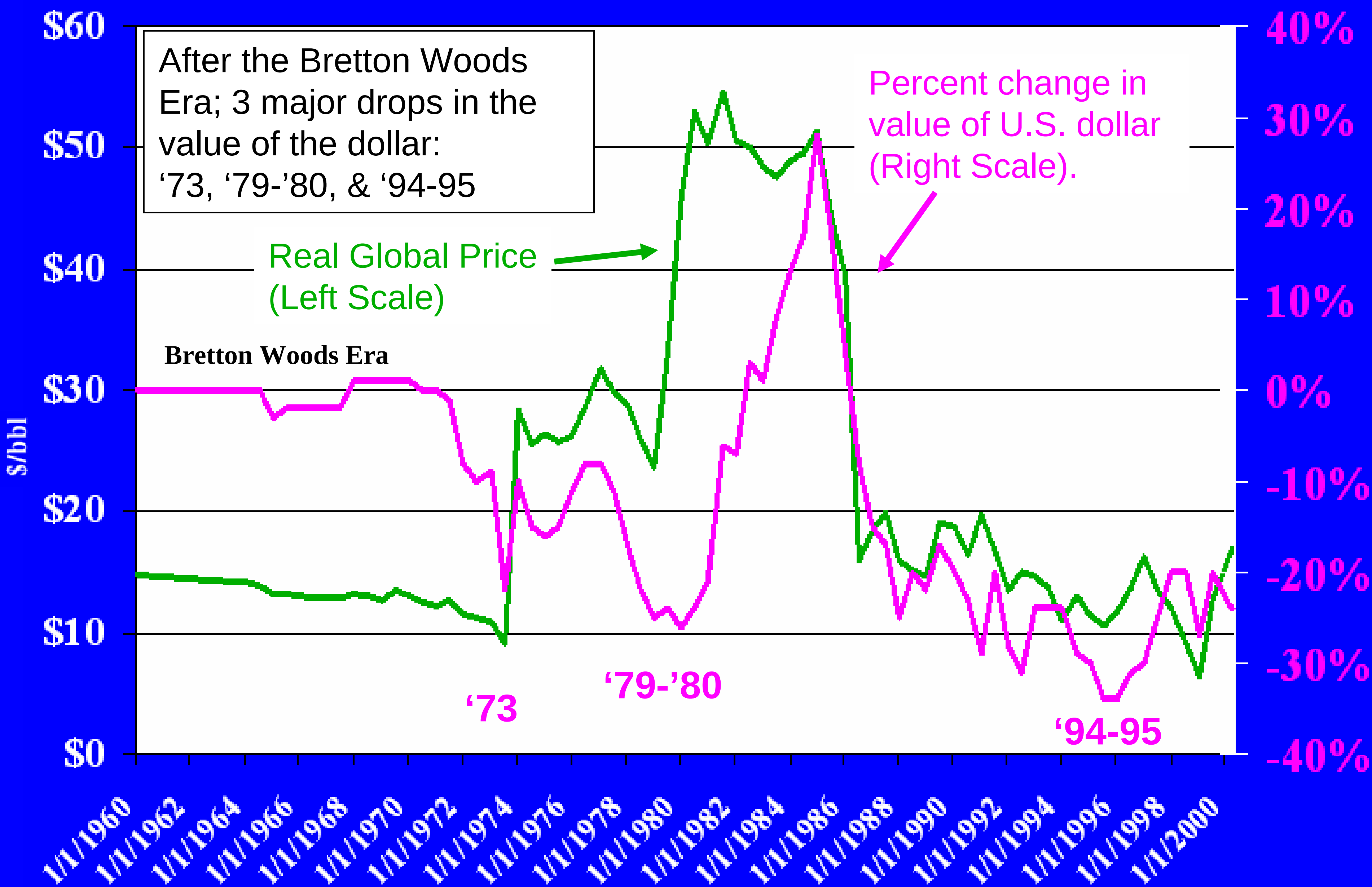
Outline of Talk

- Introduction
- Real Global Price of Oil
  - Historical Retrospective
    - Bretton Woods Agreement
    - OPEC's response to low dollar
- Commodity Analysis
- "Futurology"
- Conclusions

"Now let's look at a historical retrospective of the RGP, the Bretton Woods Accord, and how drops in the dollar 's value effected OPEC."



Data sources: IMF, WSJ, Fed. Reserve Bank of Dallas, O & G Journal

Brief History of Bretton Woods

"The most important event in oil industry history in 2nd half of the 20th century was the abandonment of the Bretton Woods Agreement in 1971.

"So, I'd like to first explain what the Bretton Woods Agreement was, and why it died."

Bretton Woods Accord

- Meeting held in Bretton Woods, New Hampshire in 1944 by Allied Powers to determine post-World War currency system.
- U.S. dollar fixed at $35/oz of gold (dollar was backed by Gold)
- Agreement to fix currency exchange rates to a 1% trading range among signature countries (this later became IMF)
- U.S. dollars and gold could be exchanged at “Gold Window” by central banks of signature countries.
- The U.S. became the world’s banker. The U.S. dollar became, and still is, the reserve currency of the world.

Bretton Woods' Demise

- Inflation in 1960's, due to spending on the war in Vietnam and Johnson's "Great Society" created an excess of dollars on global markets. The dollar was perceived as being overvalued
- There was a "run" on the US's gold bullion reserves. European countries rushed to exchange their U.S. dollars for gold bullion (at $35/oz) and sell the bullion in Switzerland for $45/oz.
- By July, 1971, only $10 billion of gold was left in Fort Knox.
- August 15, 1971: President Nixon closes "Gold Window." Bretton Woods was dead. The dollar was "floated."

"This monetary event, floating the dollar, changed the oil industry more than any other event in the 2nd half of the 20th Century. You, the people in this audience, are still feeling its effects today."

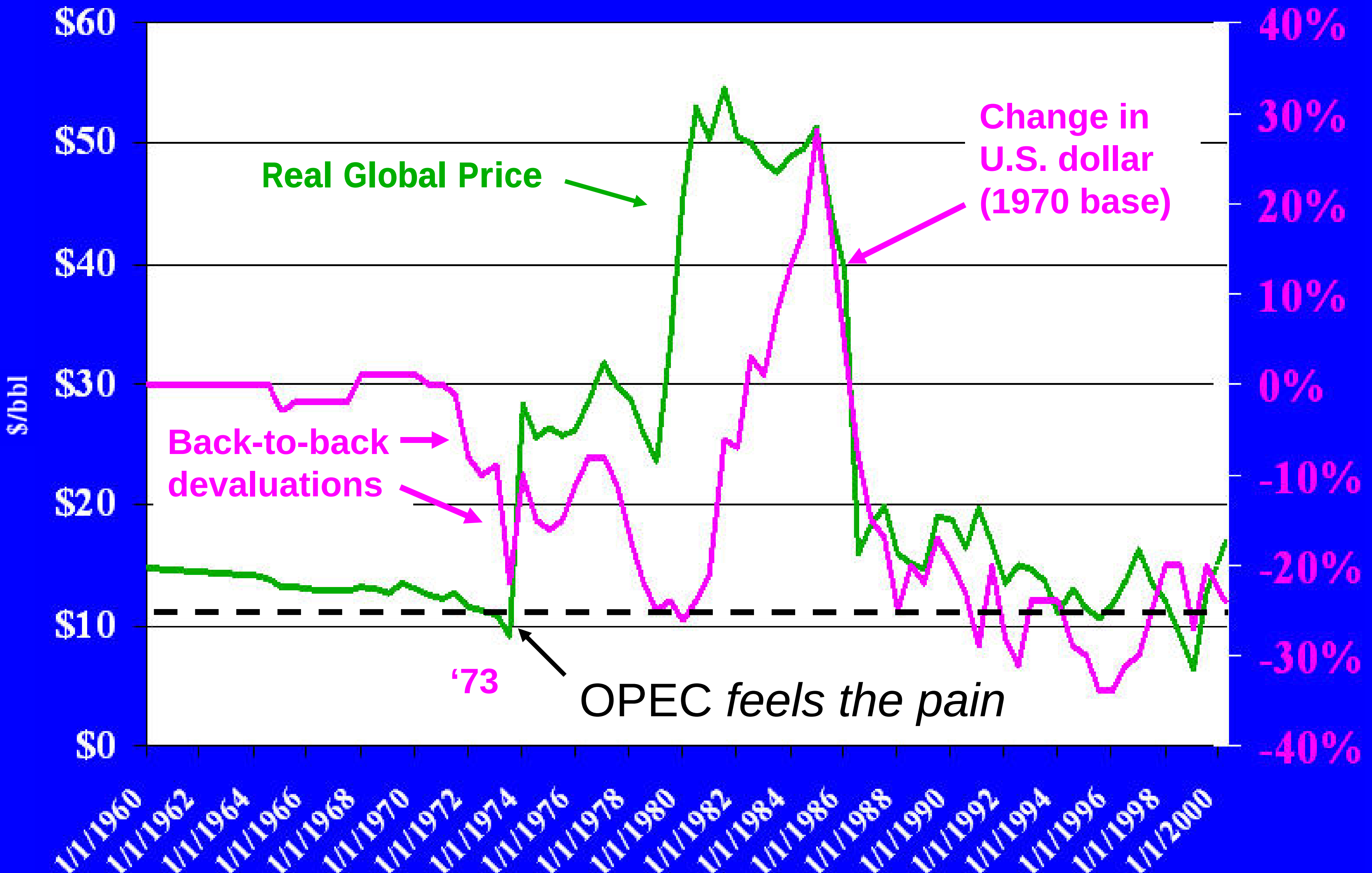
Post-Bretton Woods

- The dollar "floated" like a rock.
- Two U.S. dollar devaluations in 14 months:
    - December, 1971 - U.S. dollar is devalued 11%
    - February, 1973 - U.S. dollar is devalued 10%

"By fall, 1973, the price of gold tripled, and the price of corn and wheat doubled *before* the OPEC price increase of 1973."

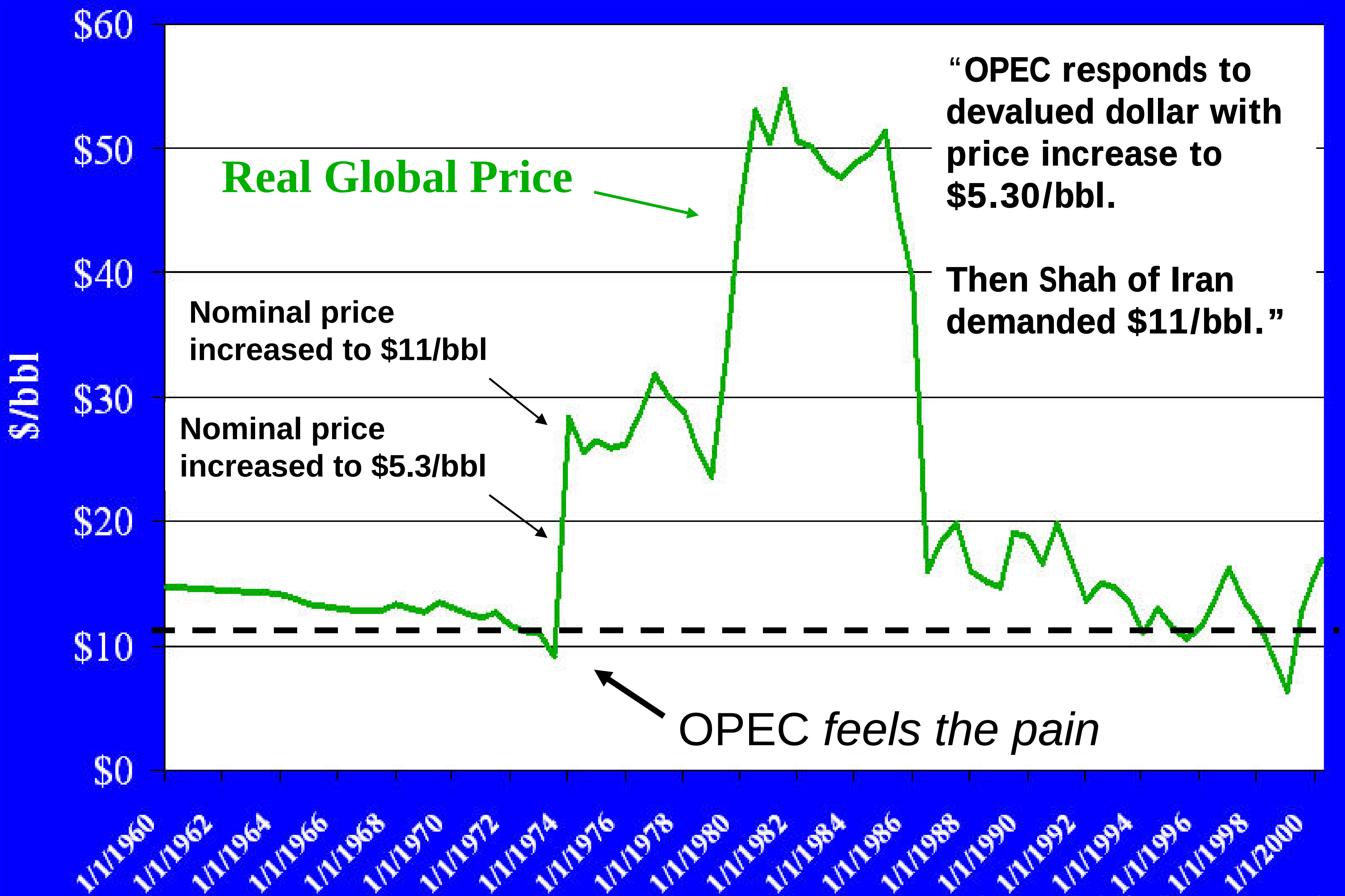
"Foreign countries that have large dollar deposits in U.S. banks, such as Saudi Arabia, see the value of their money drop by 21%. *OPEC feels the pain*"

1973 dollar collapse



Data Sources: IMF, WSJ, Fed. Reserve Bank of Dallas, O & G Journal

Dollar devaluation leads to price increase



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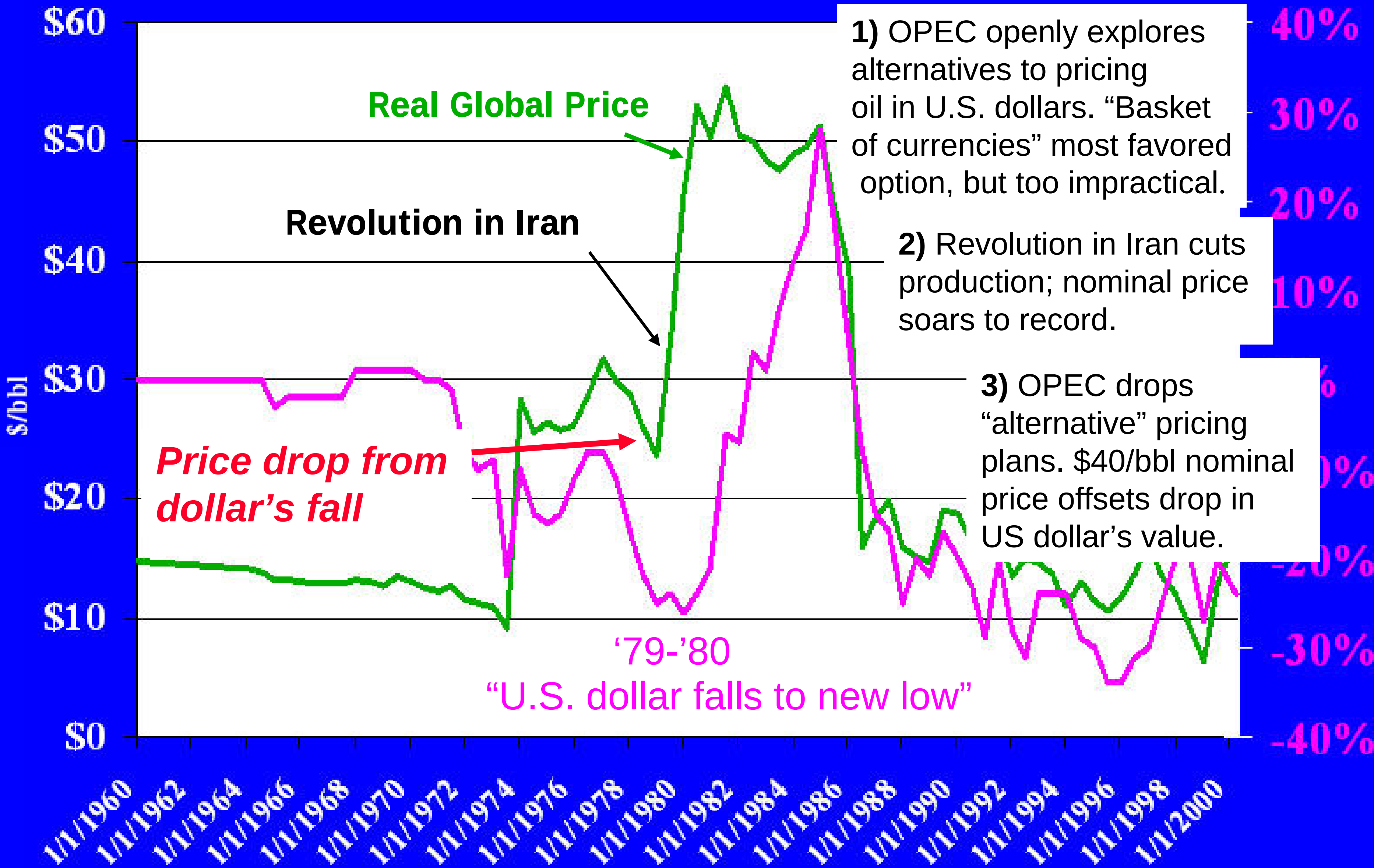
‘79-’80 dollar collapse



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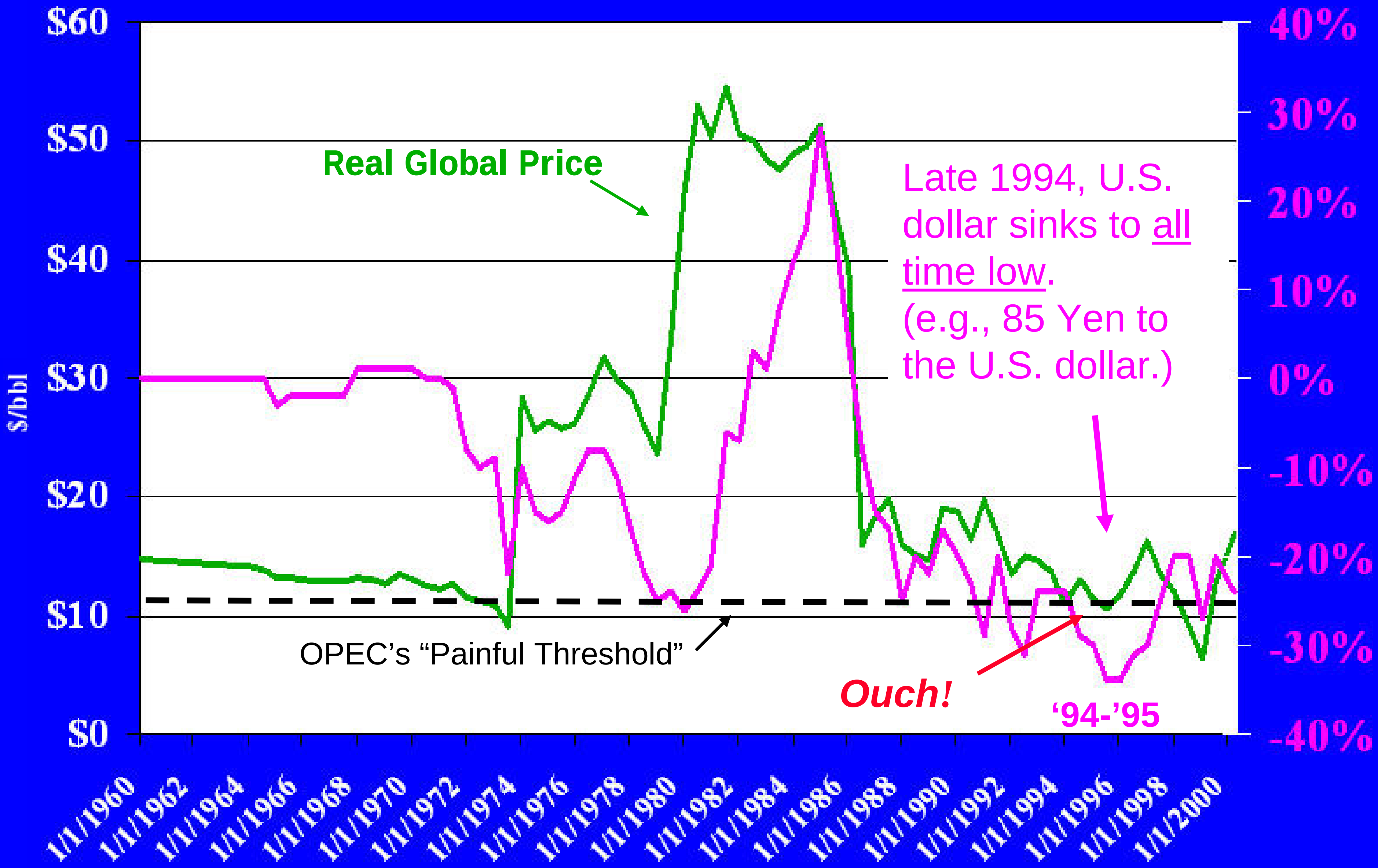
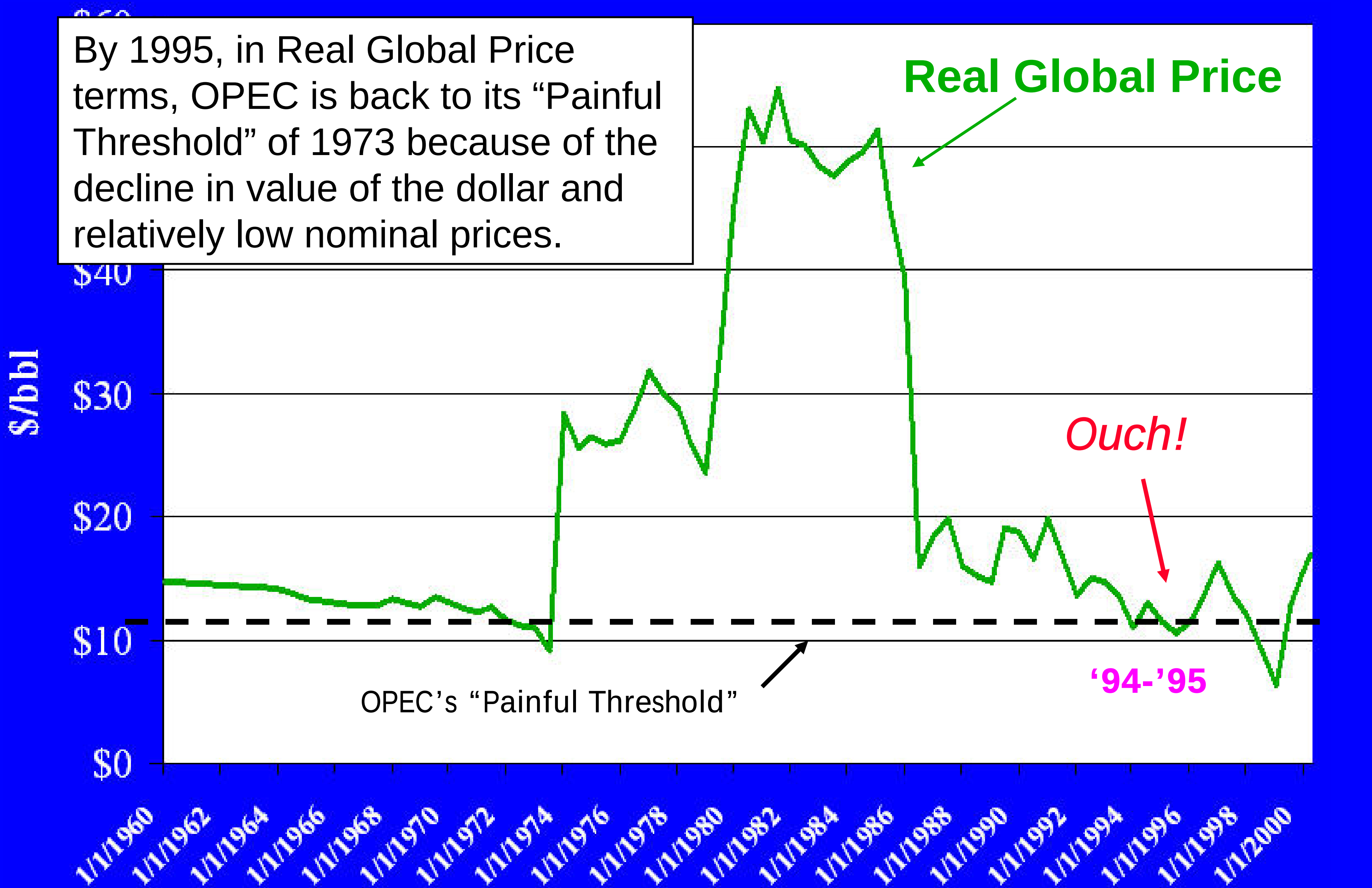
‘94-’95 dollar collapse



Data Sources: IMF, WSJ, Fed. Reserve Bank of Dallas, O & G Journal

‘94-’95 dollar collapse

By 1995, in Real Global Price terms, OPEC is back to its “Painful Threshold” of 1973 because of the decline in value of the dollar and relatively low nominal prices.



Data Sources: IMF, WSJ, Fed. Reserve Bank of Dallas, O & G Journal

1994-'95 dollar collapse worse than '73

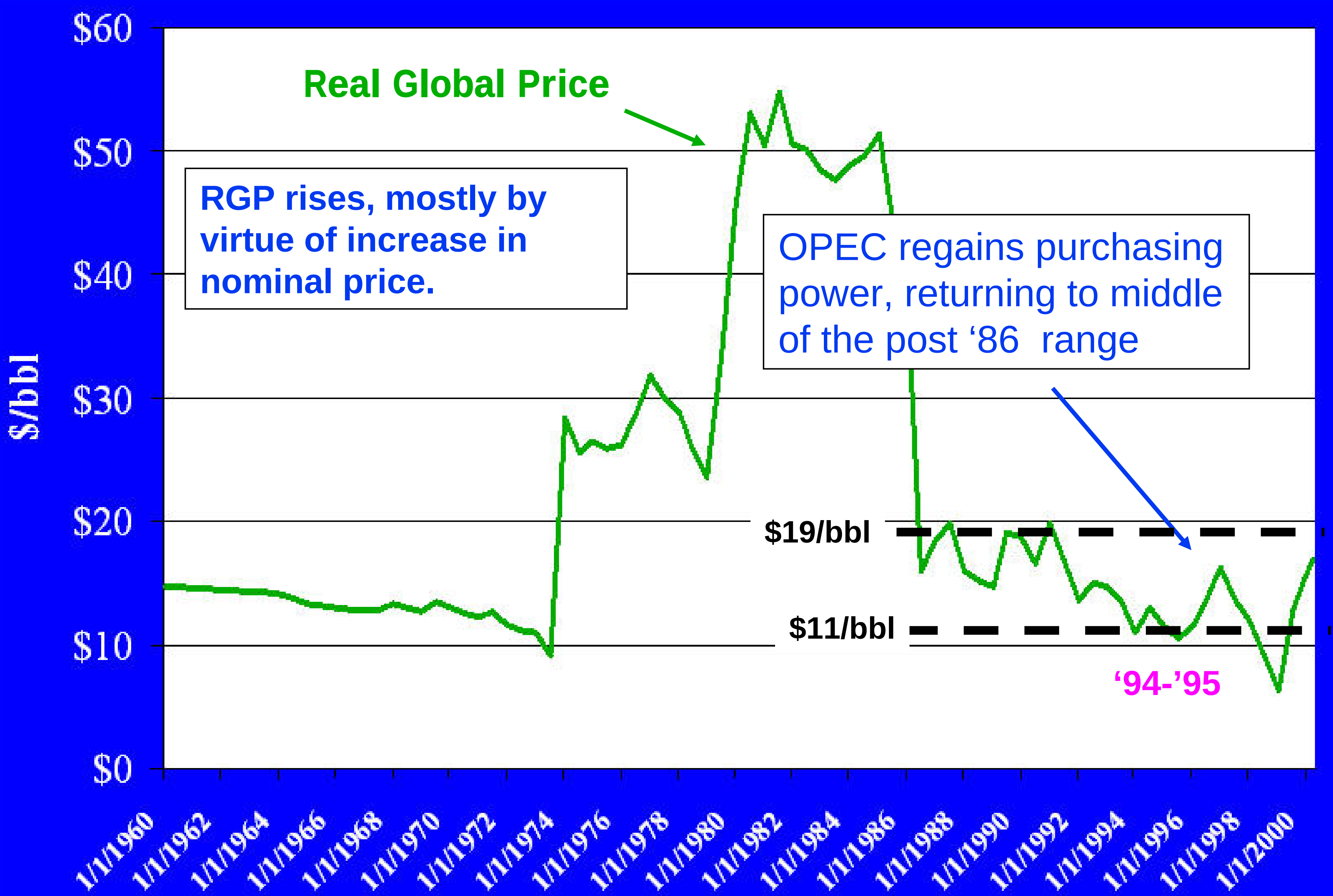
- OPEC's purchasing power parity was back to 1973 level, but their economies had changed a lot since 1973.
  - Since 1973, many OPEC countries have gone from underdeveloped nations, with mostly rural populations, to modernized urban countries with a burgeoning middle class; all built on one commodity - oil.
  - "Here is an indicative fact: in 1973, OPEC countries consumed about 0.7 mmbopd. By 1995, they consumed 5 mmbopd. This 7- fold increase in consumption is a measure of OPEC's growing middle class.
  - In addition, key OPEC countries provided subsidized medical care, education, etc. - costly programs they did not have in 1973."
- OPEC needed to regain purchasing power and openly said so before the June, 1995 meeting.

1994-'95 Collapse – a turning point

- OPEC tipped its hand. Prior to June, 1995 OPEC Meeting:
  - OPEC Secretary General suggests alternative pricing should be considered.
  - Iranian Oil Minister recommends oil be priced in Yen.
  - Algerian Oil Minister recommends oil be priced in SDRs.
  - United Arab Emirates Oil Minister recommends oil be priced in basket of currencies.

"This was the under-reported news of the decade!"

- But the alternative pricing schemes to offset the eroding dollar had the same problems they had in 1980: they were too impractical. And the solution was simple: raise nominal prices.



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Latest price collapse

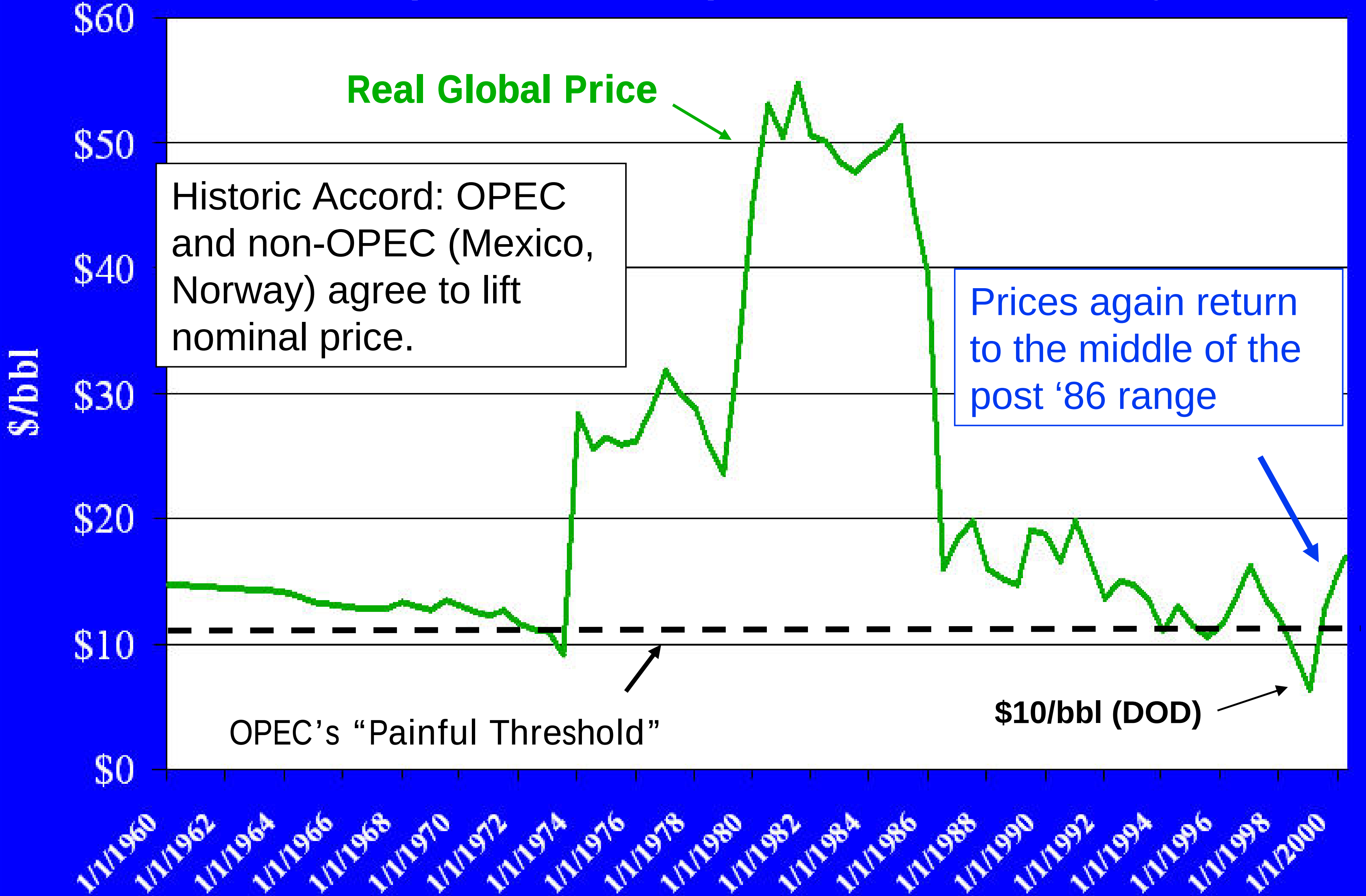
“In 1998, OPEC over-estimated demand and raised production just as the Asian currency melt-down cut oil consumption in Asia. Also, the Saudis wanted to bring discipline to over-producing OPEC member countries - in particular, Venezuela.

“The nominal oil price fell to $10/bbl but was manifestly unsustainable because it again broke through OPEC’s ‘painful threshold’ in RGP terms.

“This oil price melt-down was more important than ‘94-’95 crisis because it showed that a lot of countries shared the painful threshold.”

“People came out of the woodwork to support higher oil prices. OPEC and non-OPEC countries alike agreed to cut production.”

‘98 oil price collapse and recovery



Data sources: IMF, WSJ, Fed. Reserve Bank of Dallas, O & G Journal

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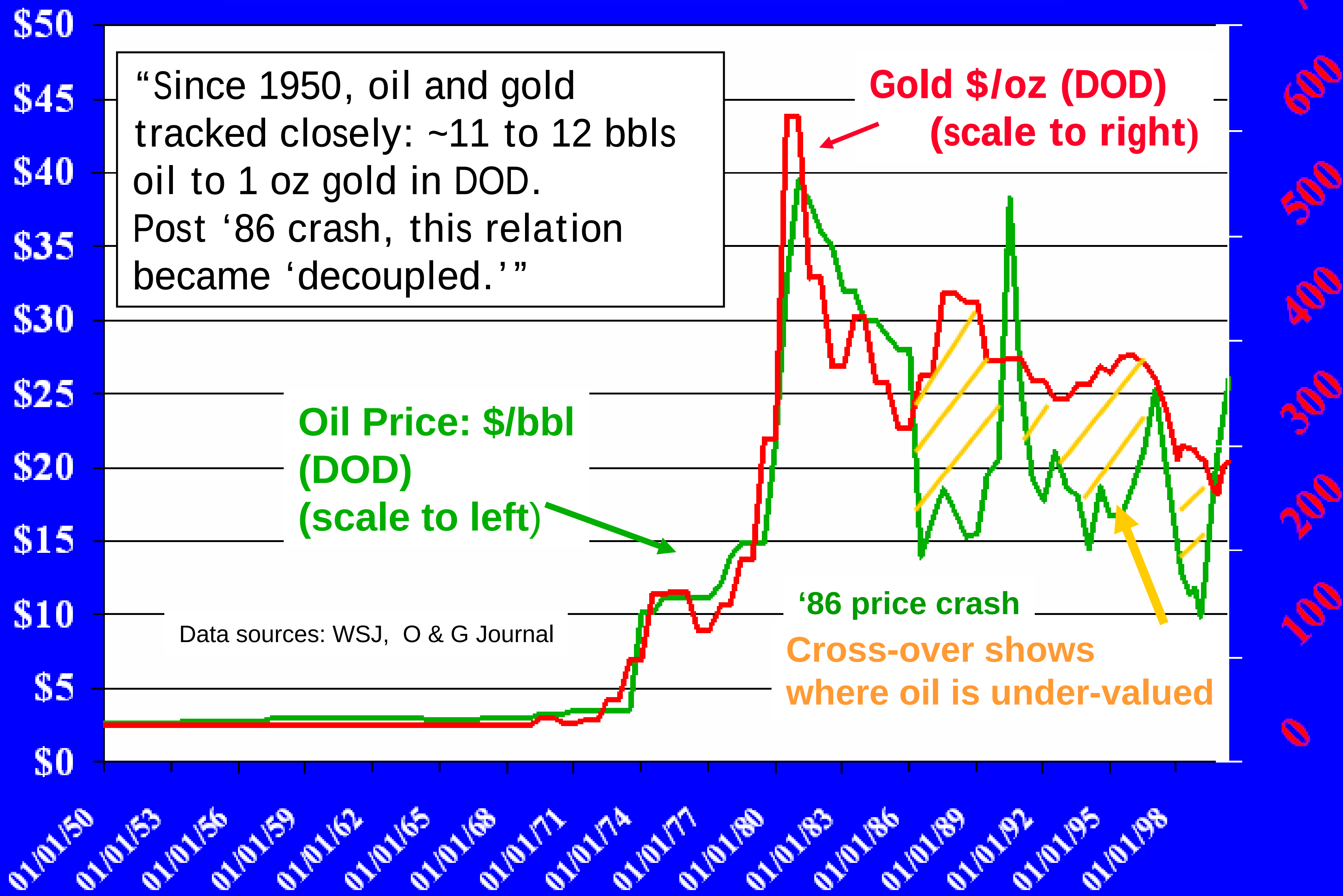
"A commodity analysis corroborates the exchange rate story. Gold has always been a standard measure of any currency's strength. Indeed, only in recent history has any currency not been backed by gold."

Gold and Oil prices (D.O.D.)



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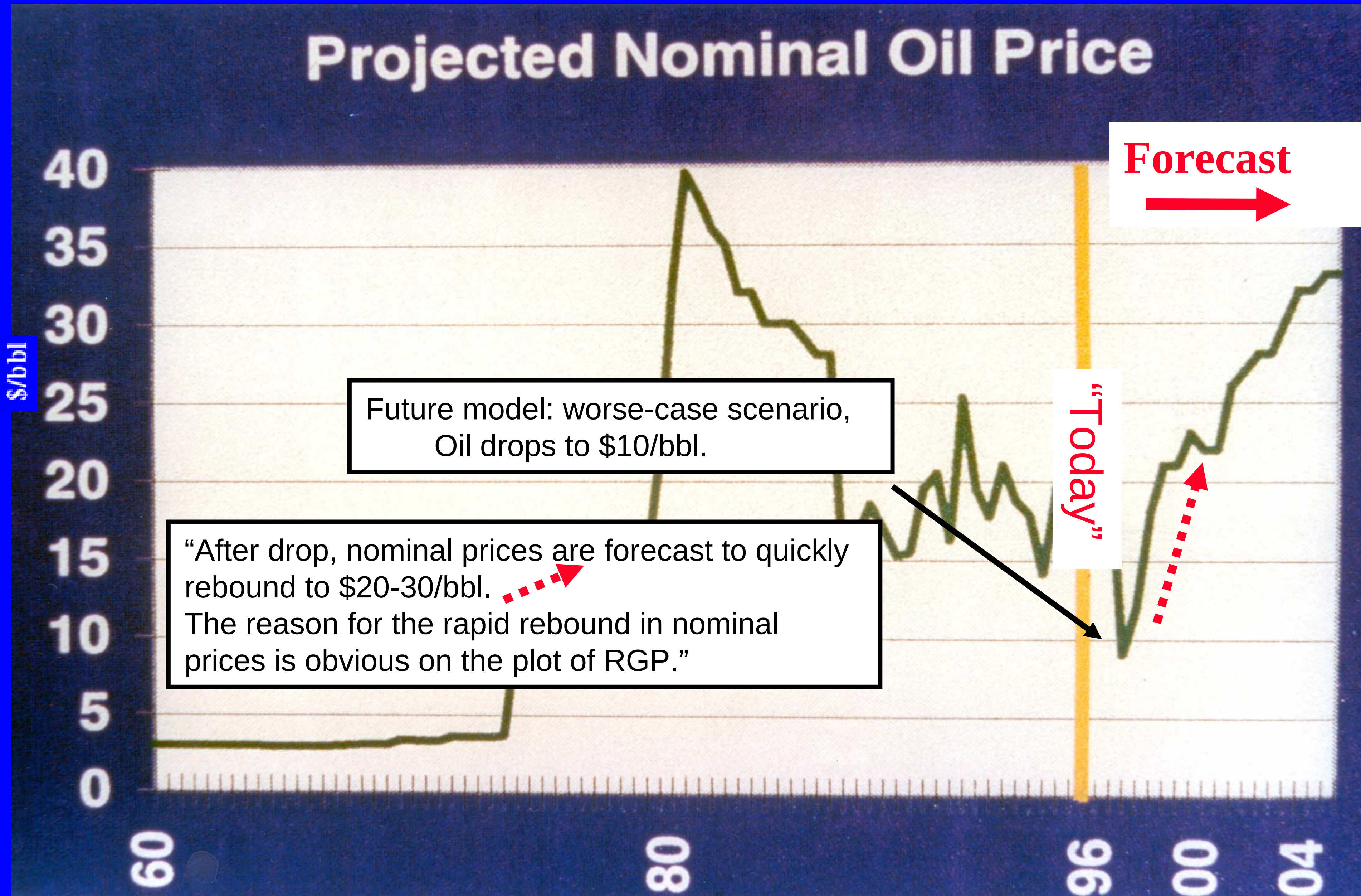
“Futurology”

“I call this section “Futurology” because I refuse to dignify price predictions as science. We can no more predict the price of oil than we can predict the stock market: all predictions prove wrong. I provide this section to demonstrate *how* the Real Global Price method works as a check of *nominal* price predictions.”

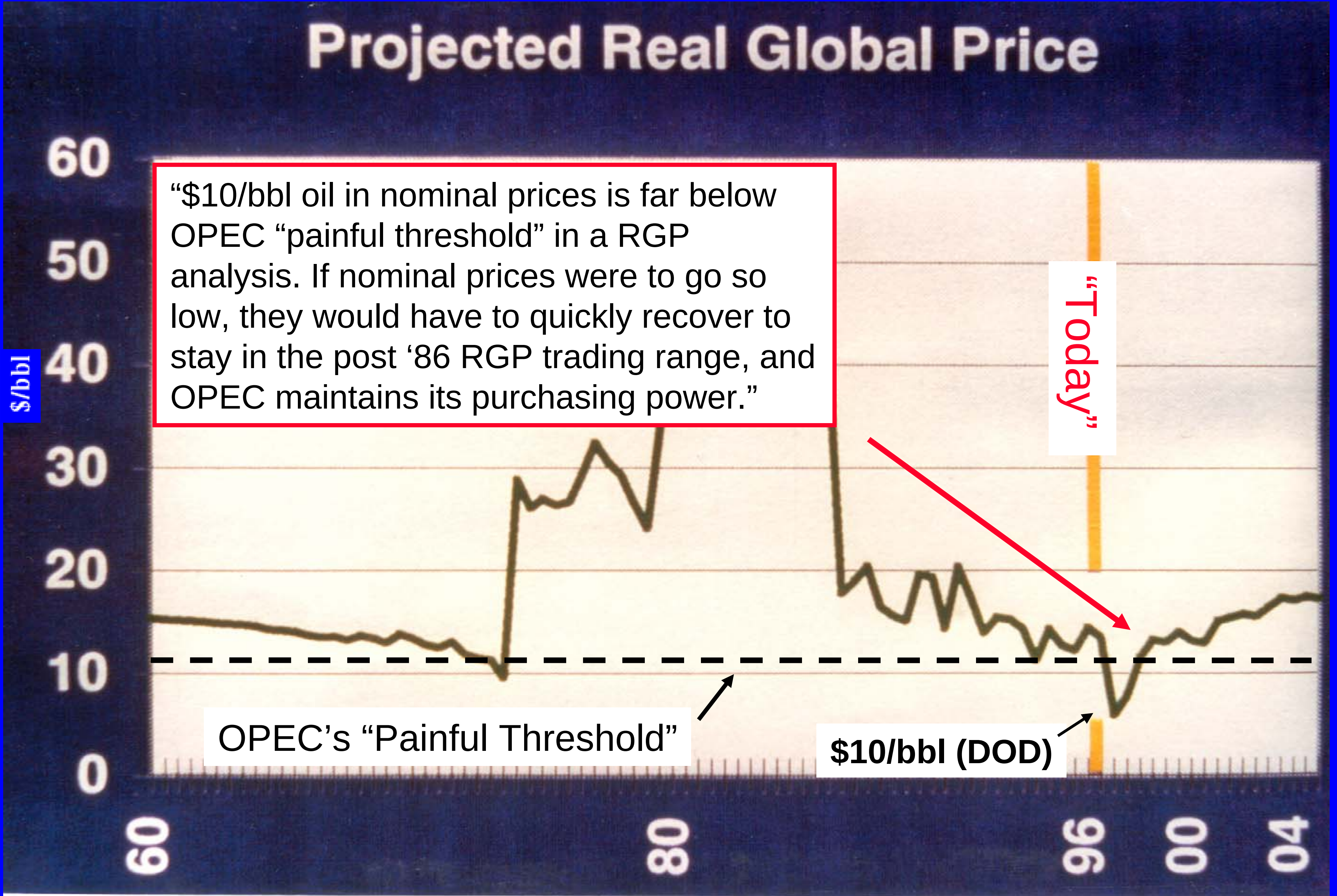
“I’ll to start by showing the future price scenarios I presented at AAPG in 1996, and how a Real Global Price analysis provides a clearer picture.”

“In 1996, I presented a future worse-case scenario that oil would drop to $10/bbl (DOD) sometime in the near future - a lucky guess – and showed this low nominal price was unsustainable when viewed in terms of the Real Global Price.”

Hypothetical forecast - AAPG, 1996 “Today”



Real Global Price Analysis - AAPG, 1996



“Futurology of today”

“Those were future price scenarios to test the Real Global Price method from 4 years ago. So what about today?” *[meaning 2000]*

As we know, OPEC recently announced it has a new price target (next slide).”

March 2000, OPEC Meeting:

Unprecedented agreement. Venezuelan oil minister to cut or increase production when certain, undisclosed levels are reached ("with a phone call")

Keep oil price within a range.

Saudi Arabia's oil minister said range he has in mind is "$20 to $25/bbl for North Sea Brent (~$22 to $27/bbl for WTI)."

-WSJ, March 31, 2000

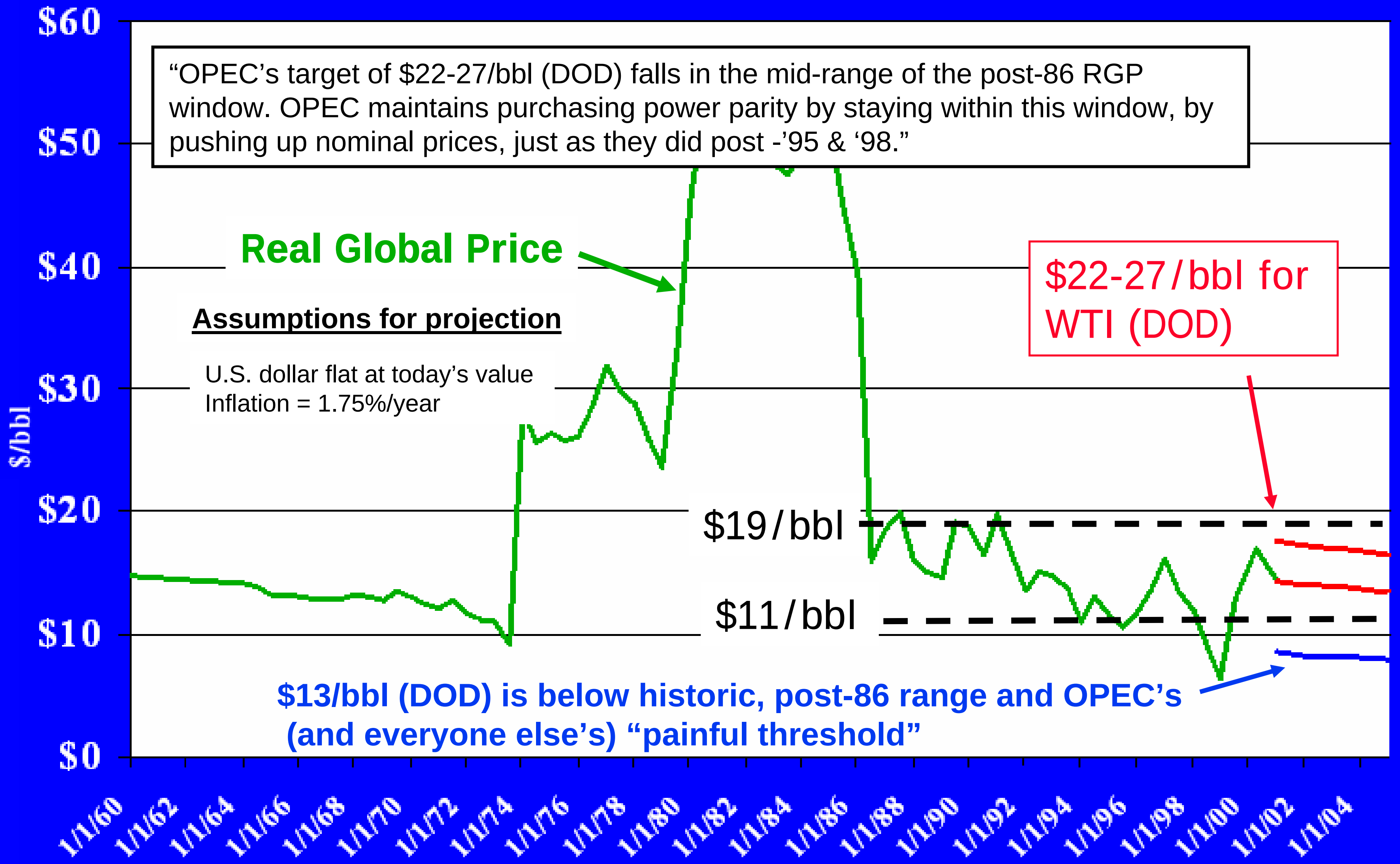
“Futurology of today” *[meaning 2000]*

“Despite OPEC’s announcement, there is still much pessimism in the industry: ‘1998 could happen all over again, so we better gear up for $13/bbl (DOD) for the rest of our lives.’

“Cooler business sense needs to be applied. Let’s convert OPEC’s stated price target from DOD to RGP and project the target range on a RGP curve. Let’s also give the pessimists their due and project out their dire predictions of $13/bbl (DOD) using RGP technique.

“Which price projections, on a historical RGP basis, seem the most reasonable to you? Does $13/bbl fit the historic data?”

Real Global Price Projections - AAPG, 2000



Data sources: IMF, WSJ, Fed. Reserve Bank of Dallas, O & G Journal

Conclusions

OPEC has not been able to pursue a "market-share policy" because of its lost purchasing power from declining dollar. (First stated in 1996 AAPG presentation.)

When supply catches up with demand, OPEC will raise nominal prices or possibly abandon the US dollar as a basis for pricing oil. (First stated in 1996 AAPG presentation.)

Current projections of nominal $13/bbl oil prices appear *improbable,* based on both technical and fundamental analyses.

Very recent rise in the value of the U.S. dollar *[2000 presentation]* could allow OPEC to shift price to the lower end of stated target range. OPEC's purchasing power would be maintained by the increase in dollar value (e.g., in the last few months, the euro has dropped from $1.18 to only $0.90).

Therefore exchange rate variations can work against bullish price scenarios. It all depends on the value of the greenback.

Exchange rates are an important factor to consider in analyzing the history of oil prices and in making price predictions.