

Energy Prices and Aggregate Economic Activity

Stephen Brown

Resources for the Future

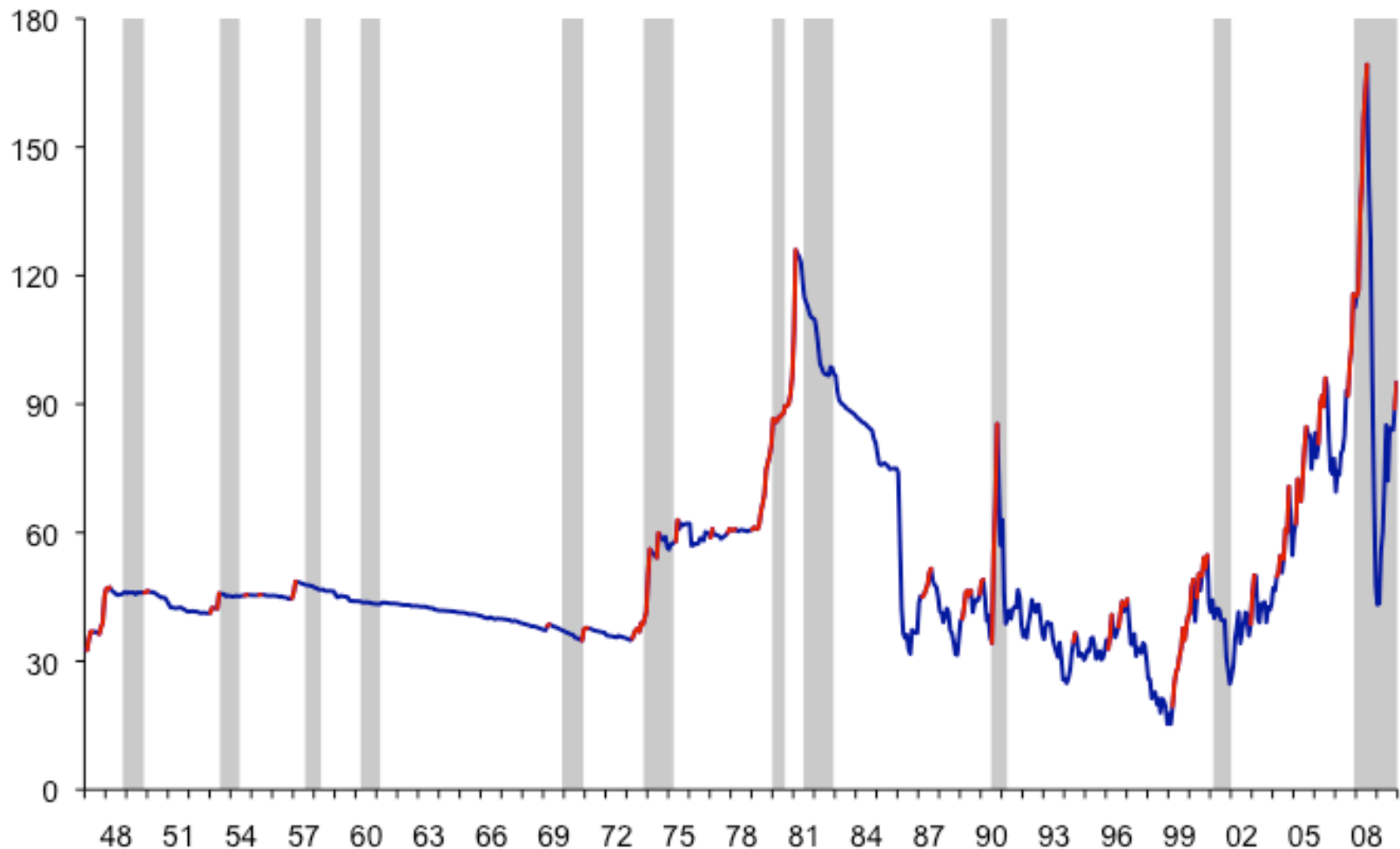


RESOURCES
FOR THE FUTURE

EIA/SAIS 2010 Energy Conference
April 6-7, 2010

Oil Prices and U.S. Recessions

Real Oil Price
Index, 1982=100

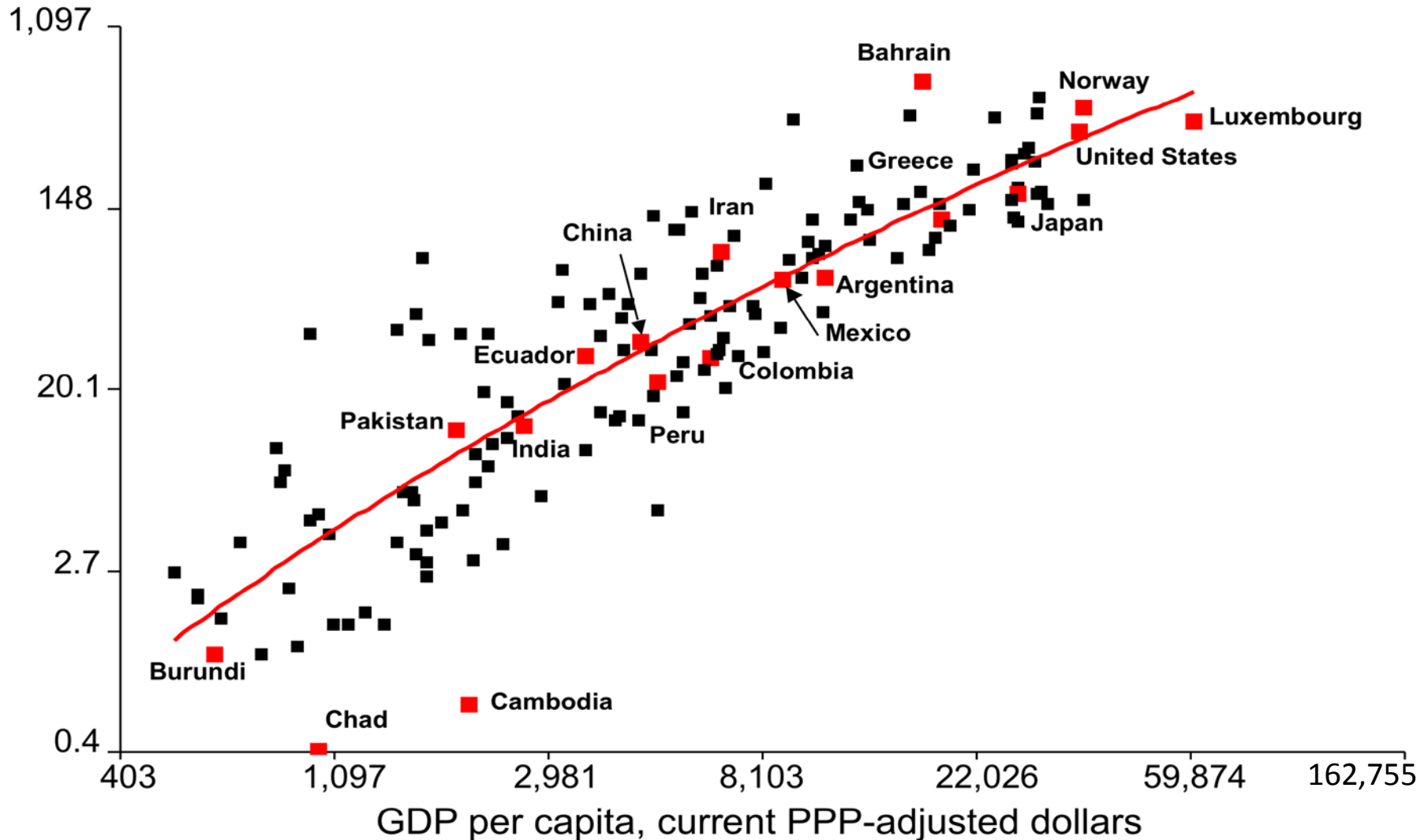


A complex relationship between oil prices and economic activity

- **Inverse relationship:** a characteristic of oil supply shocks
- **Positive relationship:** a characteristic of domestic productivity shocks that drive economic activity and oil demand
- **Neutral relationship:** a characteristic of foreign productivity shocks that drive economic activity and oil demand

Total Energy Consumption and GDP per Capita, 2002

Millions of Btu per capita

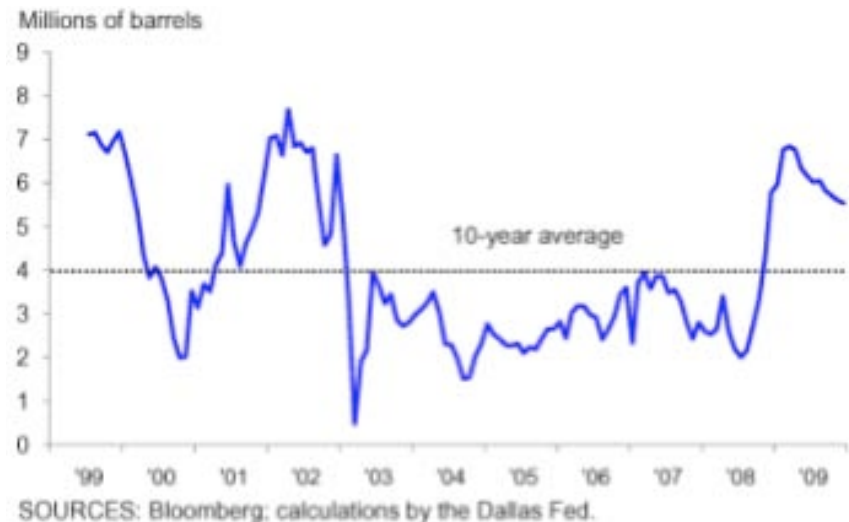


Rising Oil Prices, 2002-2008

- Strong global economy boosts oil demand
- Oil supply development lags behind
 - Oil peak or plateau
 - OPEC restraint in adding capacity
 - National oil companies
 - Rational redirection of investment
- Demand expected to grow—China, Brazil, India, Middle East
- Fear of supply disruptions in a tight market
- Weakening dollar
- Speculation/Unrealistic Expectations?
- Low demand and supply elasticities

2008 Oil Price Collapse

- Worldwide recession
- Capacity additions
- Excess OPEC capacity
- Lessened impact of supply disruptions
- Unwinding of speculative positions
- Low elasticities of supply and demand

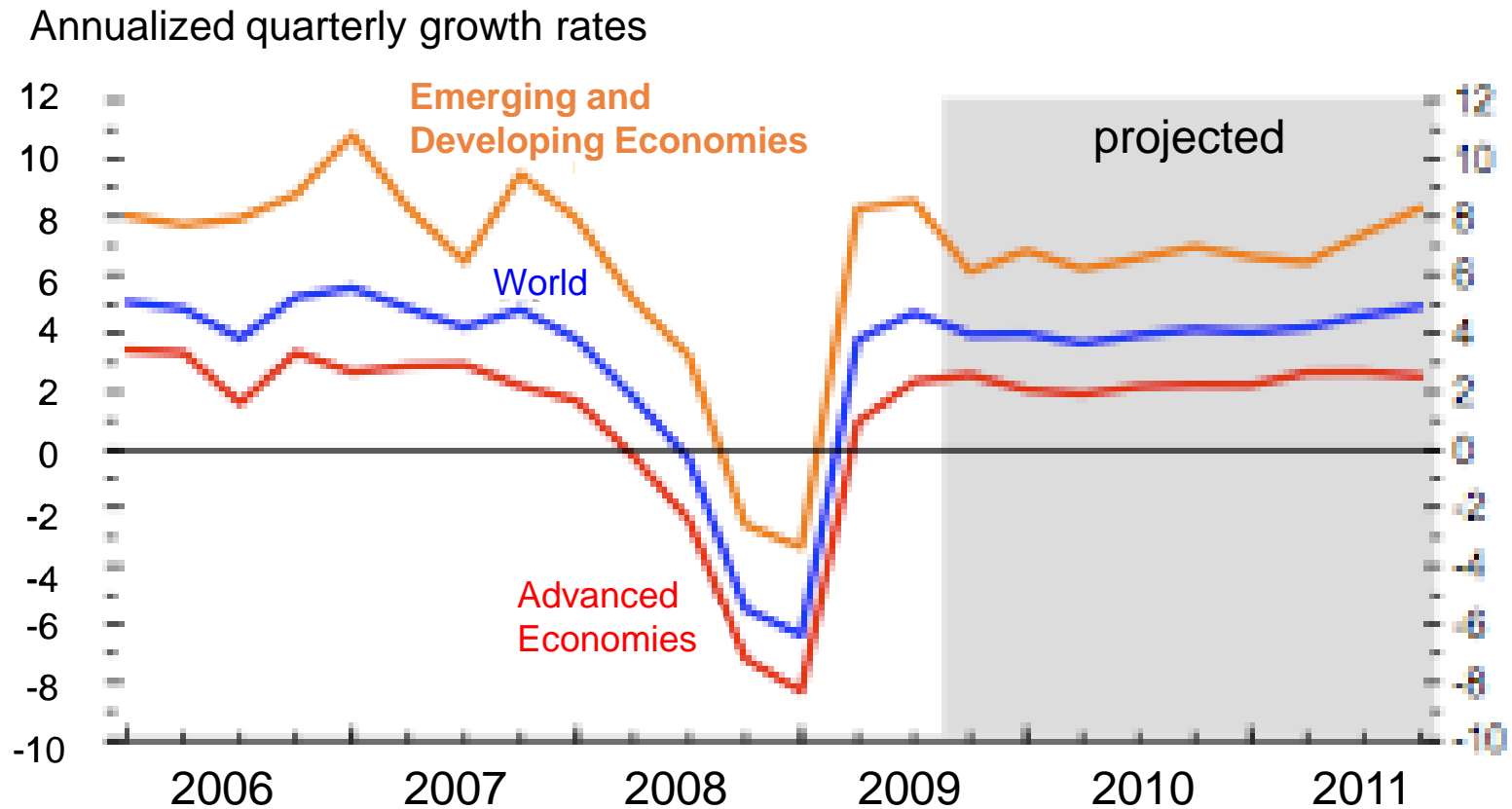


Oil Price Rebound

- Strengthening global economy boosts world oil demand
- Expectations that conventional oil supply development will lag behind
- Oil “hedge” resumes



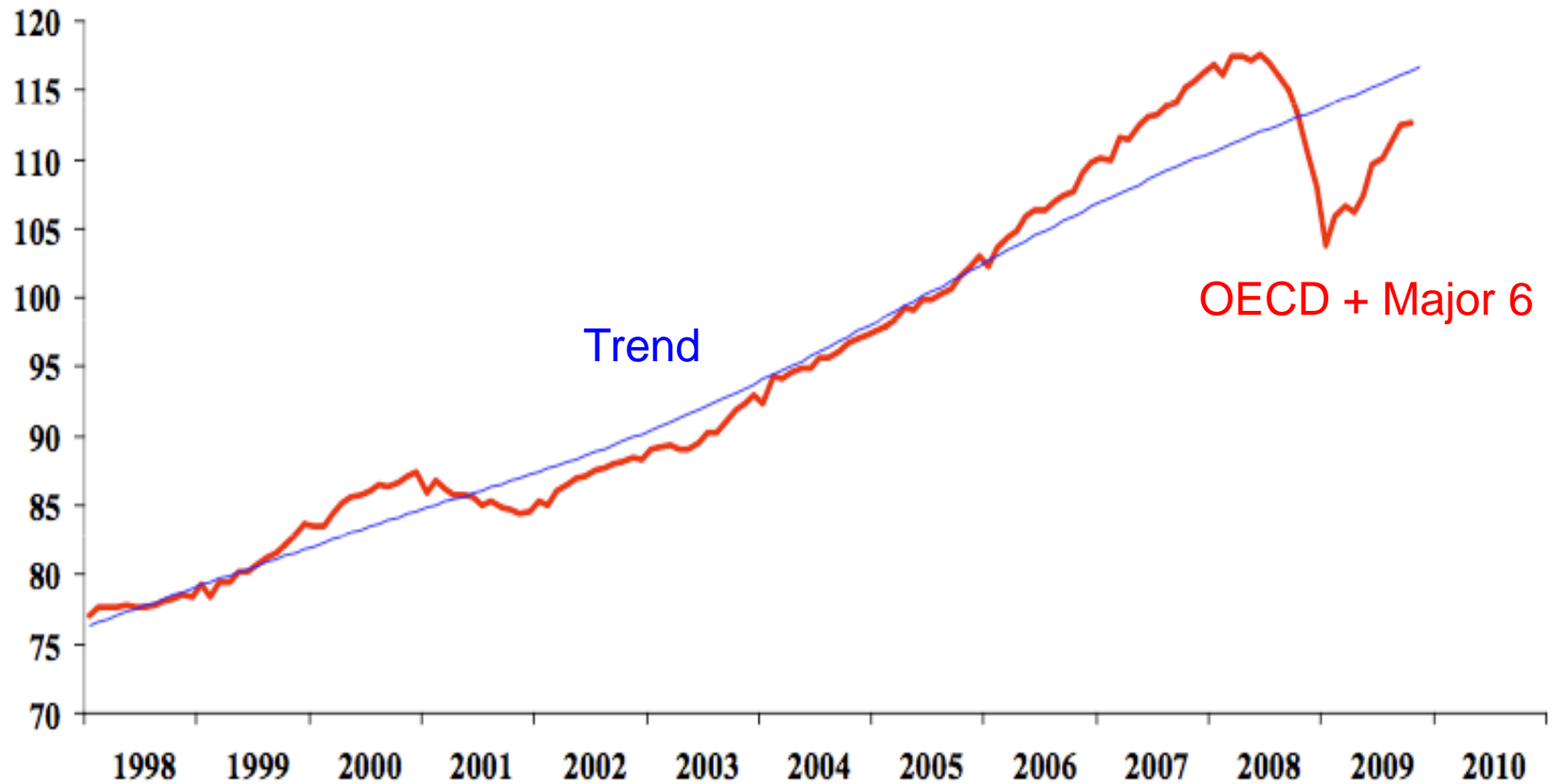
Global GDP in Recovery



Source: International Monetary Fund

Global Industrial Production Recovering

Index 2005=100



Source: OECD

Roots of Current Recession Suggest Slow U.S. Recovery

- Severe financial crisis
 - Financial/Real Estate bubble
 - Insufficient market oversight
 - Lax monetary policy
 - Loss of confidence in financial institutions
- U.S. housing may be recovering
- Confidence is rebounding
- Financing not fully restored
- Monetary policy risk as economy accelerates

A Long, Hard Slog?

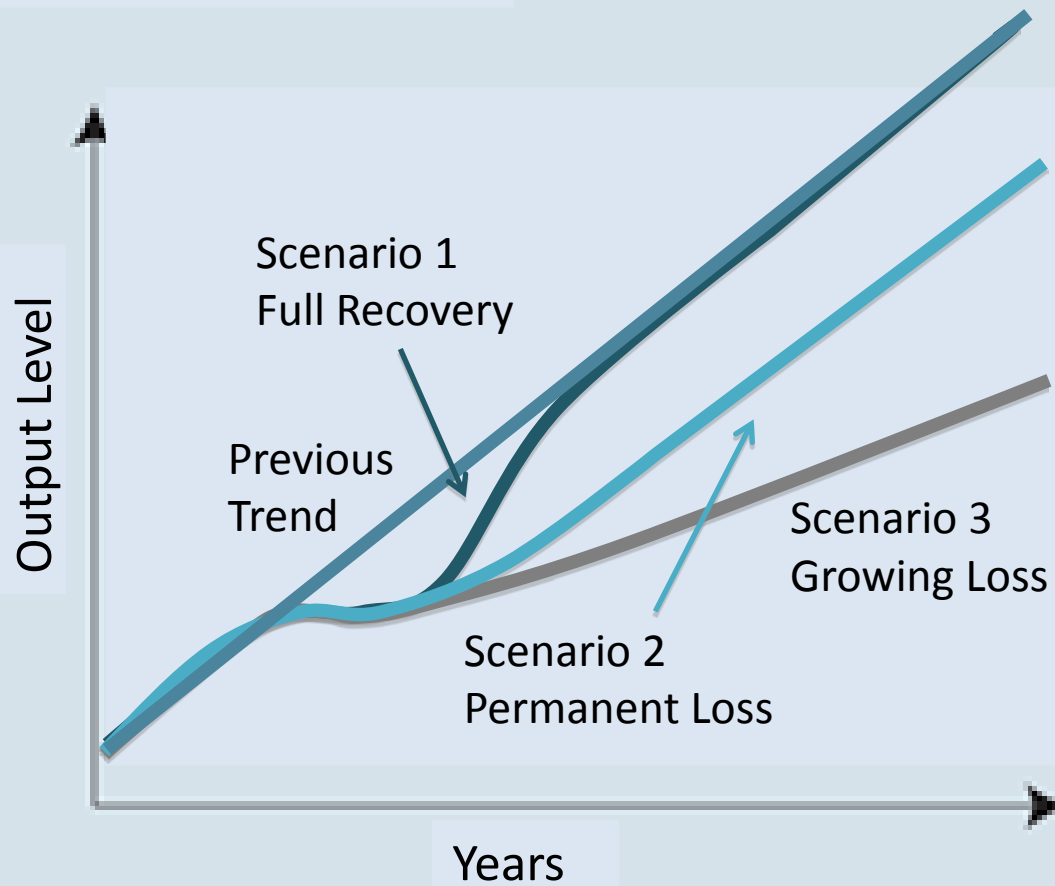
Average peak-to-trough changes
from severe financial crises

	Cumulative Change, %	Duration, years
House Prices	-36	5.0
Stock Prices	-56	3.4
Unemployment Rate*	7.0	4.8
GDP per person	-9.3	1.9

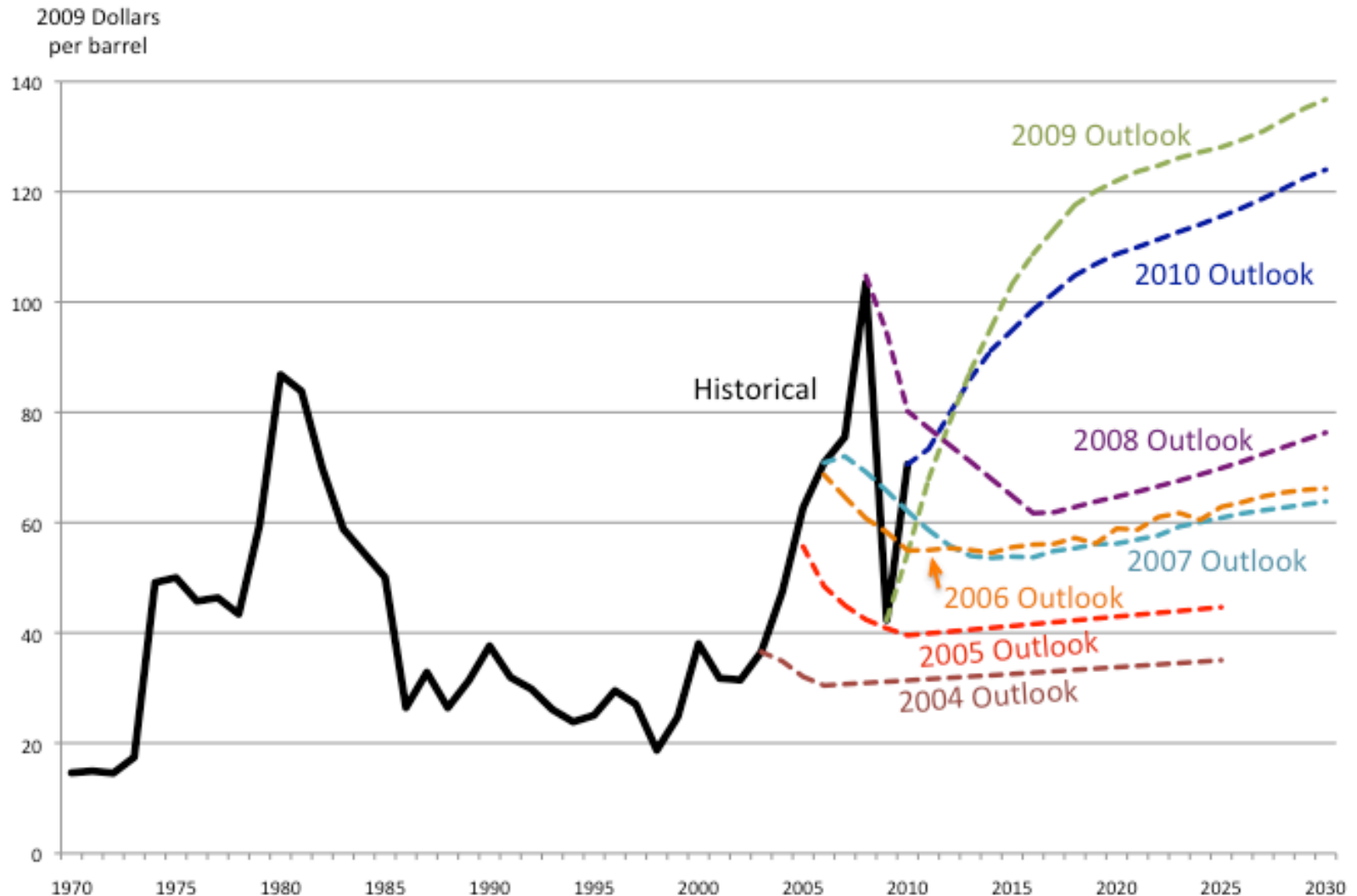
*Percentage change, peak to trough

Source: Reinhart and Rogoff, "The Aftermath of Financial Crises," 2009

Scenarios for Recovery

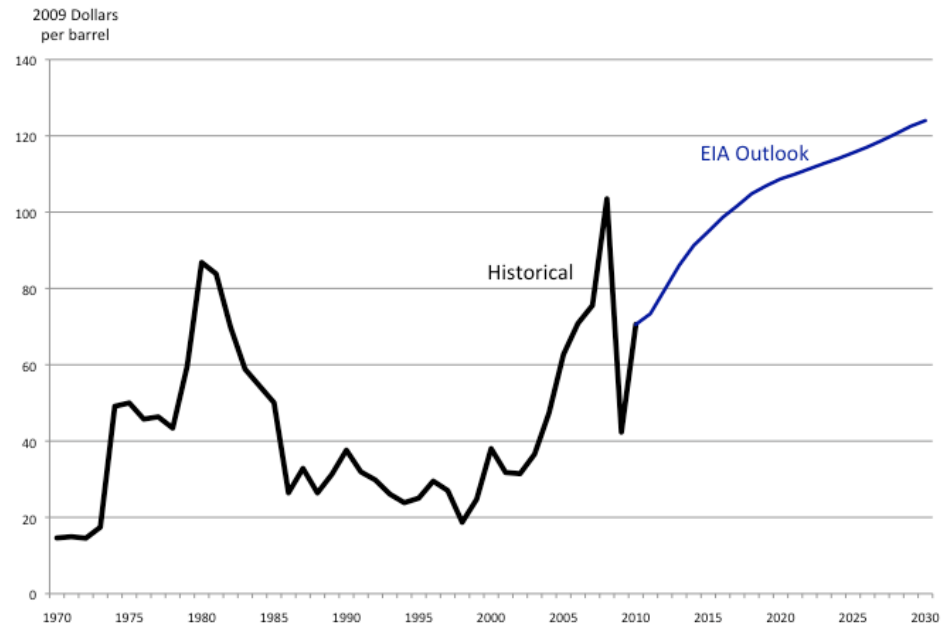


EIA Projects Strong Oil Price Rebound



Strong Oil Price Growth

- Resumption of world economic growth
- Capacity fails to keep pace with demand growth
- Growing reliance on alternatives and heavy, difficult to refine crudes



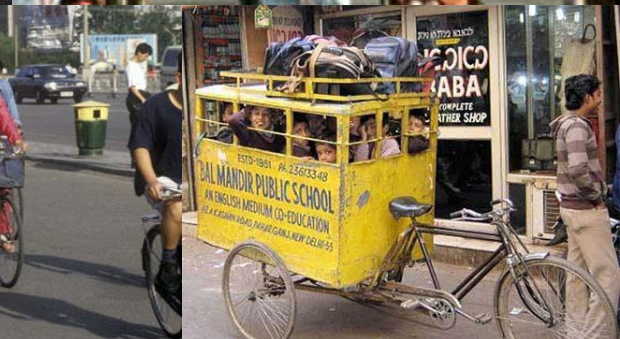
The World Economy and Oil Demand

- Strong world oil demand growth
 - Dargay and Gately (2010)
- Factors moderating oil demand growth
 - Conservation: price-induced and otherwise
 - Electric hybrids
 - Lighter-weight vehicles
 - New energy-use patterns
 - Will Asians use oil like Europeans and Americans?
Schipper (2009)

Vehicle Transformation in Asia

The collage consists of nine photographs arranged in a grid-like fashion, illustrating various modes of transport and vehicle transformations in Asia:

- Top Left:** A man riding a motorcycle in the foreground, with an elephant being ridden by another person in the background. A yellow bus and a green auto-rickshaw are also visible.
- Top Middle:** A person riding a motorcycle with a large black storage box on the back, labeled "Dada motors" and "PB-298-8 3298". Other cyclists are visible in the background.
- Top Right:** A large group of people riding bicycles down a wide street, likely in a school zone or a busy urban area.
- Middle Left:** A man riding a bicycle heavily loaded with large, rectangular blocks (possibly bricks or tiles) in front of him. A cow is walking alongside the bicycle.
- Middle Center:** A blue and orange bus driving on a road.
- Middle Right:** Another view of a large group of people riding bicycles down a street.
- Bottom Left:** A group of people riding bicycles on a street, with a yellow bus visible in the background.
- Bottom Center:** A yellow bicycle-powered vehicle (a "rickshaw" or "cycle rickshaw") carrying passengers. It has text on the side: "ESTD 1961 PA 256133-48", "BAL MANDIR PUBLIC SCHOOL", "AN ENGLISH MEDIUM CO-EDUCATION", and "A KEDHAR ROAD, PUNJAB, NEW DELHI-110055".
- Bottom Right:** A yellow bicycle-powered vehicle (a "rickshaw" or "cycle rickshaw") carrying passengers. It has text on the side: "ESTD 1961 PA 256133-48", "BAL MANDIR PUBLIC SCHOOL", "AN ENGLISH MEDIUM CO-EDUCATION", and "A KEDHAR ROAD, PUNJAB, NEW DELHI-110055".



Vehicle Transformation in Asia



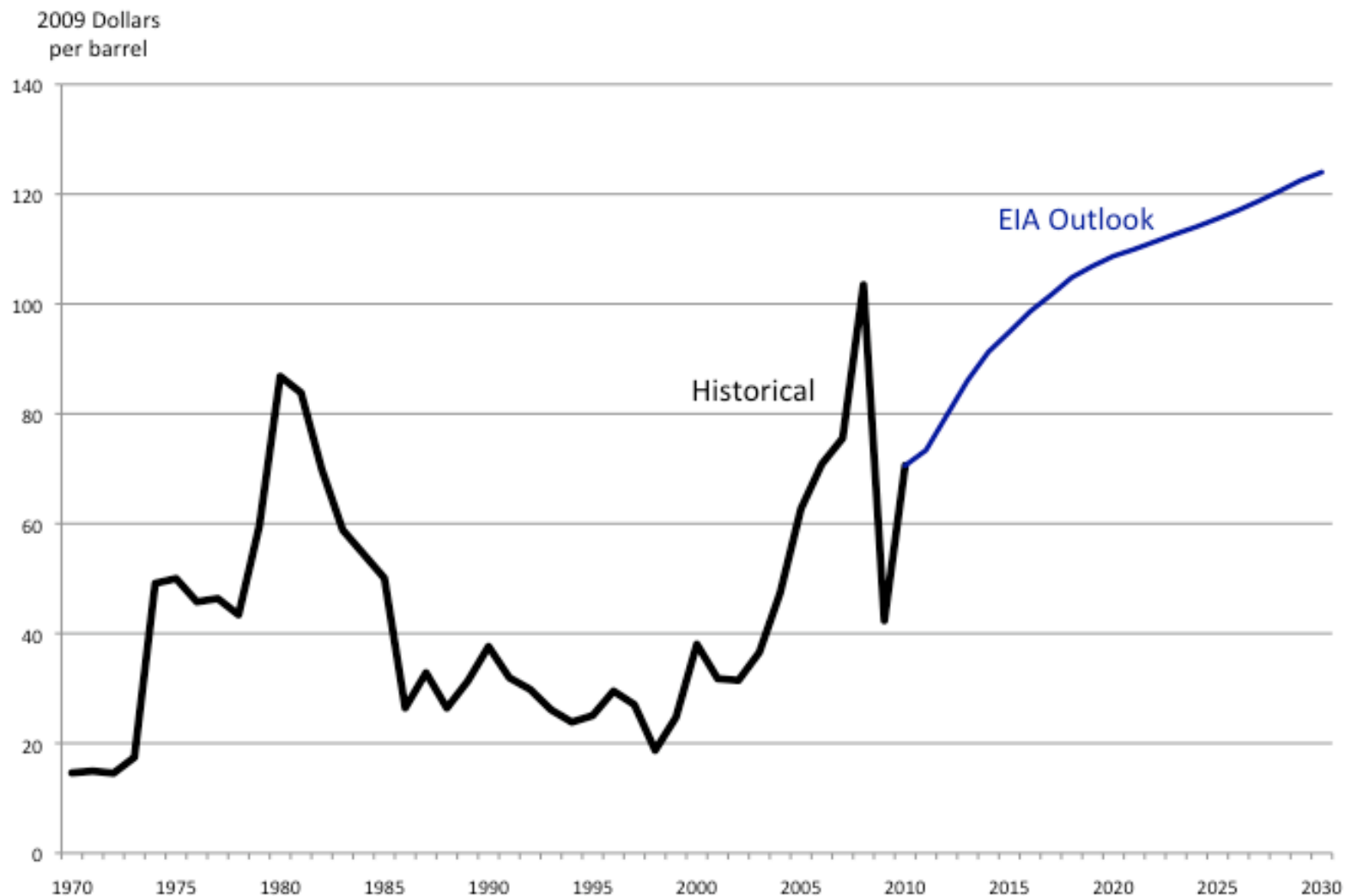
Vehicle Transformation in Asia



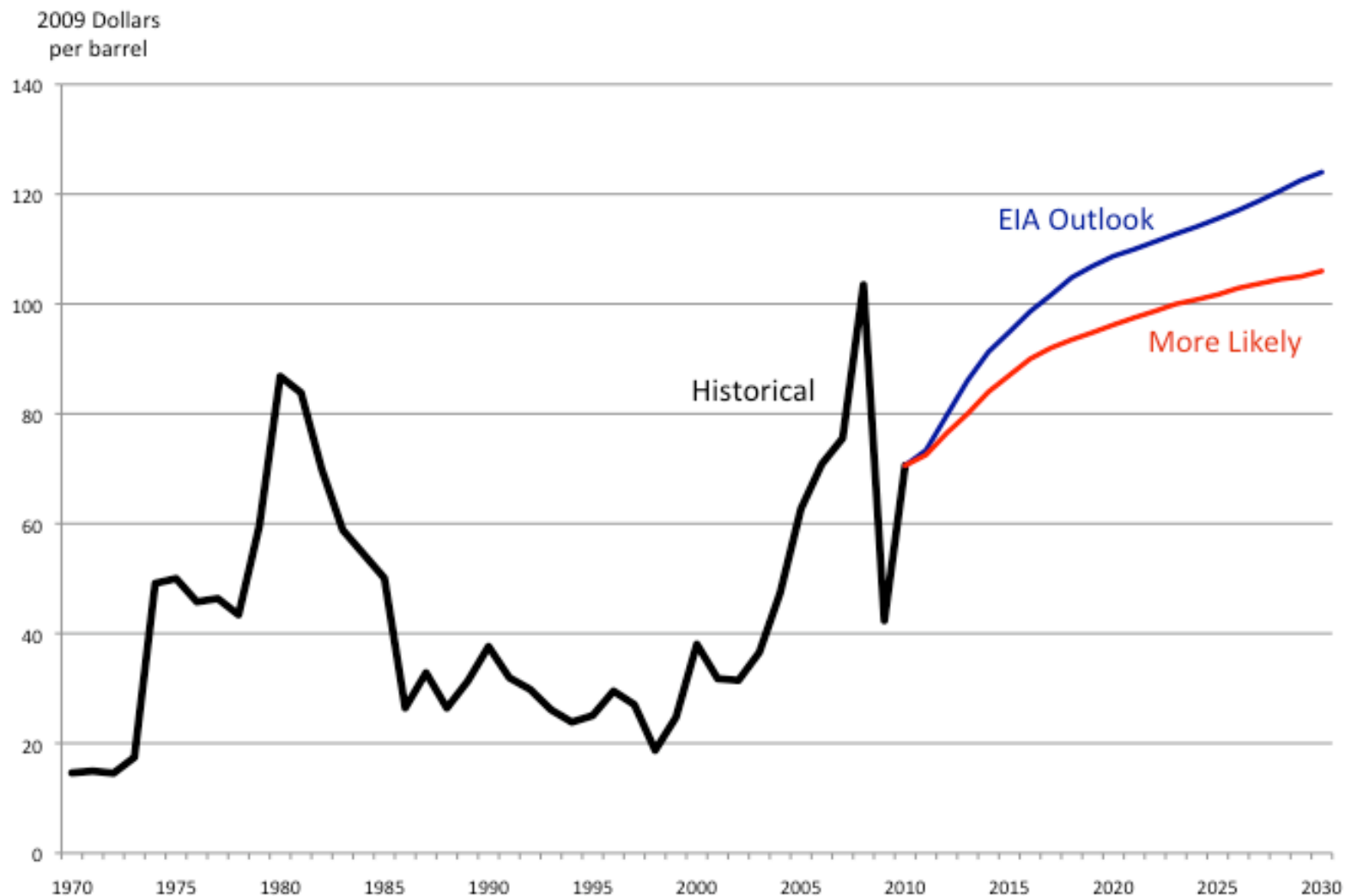
Vehicle Transformation in Asia



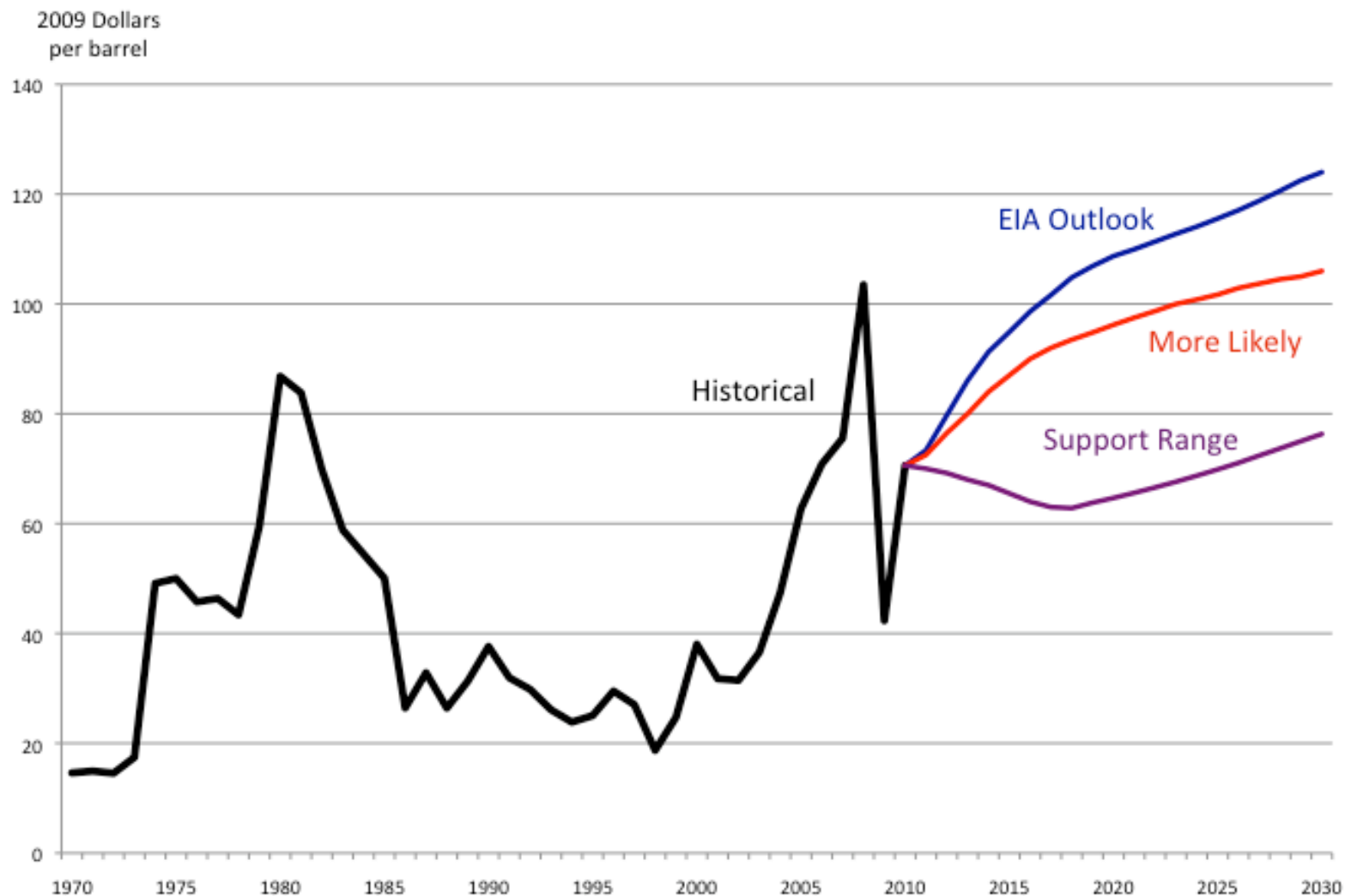
Oil Price Outlook



Oil Price Outlook



Oil Price Outlook



Conclusions

- Weak global economy depressed oil prices
- Economic recovery boosts world oil demand
- Oil “hedge” against dollar will unwind
- Oil prices of \$70-105 per barrel as recovery takes hold
- Timing remains a question
 - Most expect a slow economic recovery

