Nonlinear nonlinearities

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Refer to important disclosures on page 61 to 64.
Scholarly works on oil

Source: University of Michigan, University of California: San Diego, BofA Merrill Lynch Global Research
Six oil episodes

West Texas intermediate spot oil price
($ per bbl, Log scale)

Source: Haver Analytics, Wall Street Journal, BofA Merrill Lynch Global Research
Two topics

• Lessons from six episodes

• Lessons from monetary policy
A slippery link: Oil & the economy

- **Identification**: supply vs. demand

- **Reaction function**
  - **Threshold effects**: Only large shocks matter
  - **Asymmetry**: Only increases matter
  - **Volatility**: Big change is bad in either direction
  - **Duration**: Only persistent moves matter
  - **Framing**: The context or cause of the price change matters
Episode #1: Lower oil prices... hurt growth

Source: Bureau of Economic Analysis, BofA Merrill Lynch Global Research
Episodes #2: Oil, confidence and growth

WTI: West Texas Intermediate

Source: Conference Board, Bureau of Economic Analysis, BofA Merrill Lynch Global Research
Episode #3: Oil - Asia = 0

WTI refers to West Texas Intermediate crude oil
Episode #4: Global GDP & oil prices

Real GDP (LHS)

WTI Crude Oil (RHS)

Episode #4:
Net oil price increase

PPI: crude petroleum (percent)

Footnote: Measured as net increase in oil prices over the previous peak value in the previous twelve quarters
Source: Bureau of Labor, BofA Merrill Lynch Global Research
Vehicle miles of travel
(year/year % change of the 3-month moving average)

Source: Federal Highway Administration, BofA Merrill Lynch Global Research
Episode #5: Share of ugly vehicles (SUVs)

Trucks as a % of light vehicle sales (percent)

Source: Autodata Corporation, BofA Merrill Lynch Global Research
Episode #5: Pre-Lehman job losses

Change in total nonfarm employment
(3-month moving average, year/year % change)

Source: National Bureau of Economic Research, BofA Merrill Lynch Global Research
Episode #6: Inflation drives consumption?

Real Consumer Spending (3-mo. % change, saar, LHS)

Headline CPI (3 mo. % change, Saar, inverted, 1-mo. lag, RHS)

Source: BofA Merrill Lynch Global Research
Episode #6:
Reduced form rubble

Real Consumer Spending
(3-mo. % change, saar, LHS)

Headline CPI (3 mo. % change,
Saar, inverted, 1-mo. lag, RHS)

Source: Bureau of Economic Analysis, Bureau of Labor Statistics, BofA Merrill Lynch Global Research
Episode #6: Unfortunate timing

PCE growth vs. CPI inflation*, 48 month rolling correlation

*CPI data is lagged one month
Source: BofA Merrill Lynch Global Research
History lessons

- 1986: Sectoral effect - Hurts oil patch more than rest of country
- 1991: Framing effect - Memories of 1970s accentuate the shock
- 1998: Temporary down and up makes less potent
- 2002-7: Slow price increase ignored
- 2008: $4 gas gets noticed
- 2009: Importance of supply/demand in interpreting reduced form
Oil & Monetary Policy
1. Cut funds rate to 1%

- **Appropriate use of risk management given...**
- **Low and falling core inflation**
- **Risk that recovery would falter**

(3-mo % change annualized)

Source: Bureau of Labor Statistics, BofA Merrill Lynch Global Research
2. Perfectly predictable policy

- Poor risk management given...
- Continued easing of financial conditions
- Signs of bubble behavior in credit & housing
- Forgiving a lot of oil-driven inflation
- Not a good time to risk anti-inflation credibility
- => Should have put fear of the Fed with 50 bp hike

Source: Federal Reserve Board, BofA Merrill Lynch Global Research
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CPI inflation 2002-07 (percent)

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<th>1.75 Target</th>
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<tr>
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<td>16.3</td>
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Source: Federal Reserve Board, BofA Merrill Lynch Global Research
3. The summer of ’08: Delaying game

- **Good risk management given...**
- **Contained inflation expectations**
- **High risk of full blown recession**
- **High probability of pop in oil prices**
- **A good time to risk anti-inflation credibility**

Source: Haver Analytics, BofA Merrill Lynch Global Research