Energy and the Macroeconomy: the role of natural gas and the U.S. energy boom

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The views expressed are those of the presenter and should not be attributed to the IMF.
Outline

A. Oil & the Macroeconomy: New Developments since Blanchard-Gali
B. Measuring Diversification
C. Impact of U.S. Energy Boom

Takeaways

A. No longer about just oil: Diversification in sources (natural gas; US energy boom)
B. Depend, but Diversify
C. Don’t Get Carried Away by the Shale Gale
A. Oil & the Macroeconomy: Some New Developments

- Diversification from increasing role of natural gas
- Boom in ‘unconventional energy’
Oil & the Macroeconomy: A Slippery Relationship

“The macroeconomic impacts of oil shocks are ignored [in the book]; this neglect is sensible given the wide varieties of prevailing views and the uncertainties about which results, if any, are valid.”

-- Richard L. Gordon

(in a book review in The Energy Journal)
Two dominant views

- Exogenous oil price shocks have played a key role in nearly every post-WWII U.S. recession and remain an important force even today.

- The importance of oil price shocks in causing the 1970s stagflation has been overstated.

- Oil price increases today are driven by demand increases in emerging markets and are different from the oil shocks of the 1970s.
A two-handed approach

- Oil price shocks did play an important role in the stagflation of the 1970s

- But there have been changes since:
  - Our luck may have changed for the better
  - Real wages are less rigid
  - Monetary policy response is better
  - Share of oil in production & consumption is lower

- Net result: oil price shocks have smaller effects on output and inflation in the 2000s than in the 1970s (Blanchard & Gali, 2009; Blanchard and Riggi, 2010)
Some new developments

- Adding two elements to Blanchard-Gali view
  - More sources of energy
    - Role of natural gas
  - More sources of supply
    - Unconventional energy boom

- Not discussed in this presentation but always lurking:
  - short-run effects—including through ‘uncertainty’ channel—from large supply disruptions
Global Consumption of Oil and Natural Gas

Source: BP Statistical Annual
U.S. Energy Boom

US Shale Gas Production (Bcf/d)

- Bakken (ND)
- Eagle Ford (TX)
- Marcellus (PA and WV)
- Haynesville (LA and TX)
- Woodford (OK)
- Fayetteville (AR)
- Barnett (TX)
- Antrim (MI, IN, and OH)
- Rest of US
B. Measuring Diversification

• Takeaway Message: “Depend, but Diversify”
  (meant to remind old-timers of “Trust, but Verify”)

Based on Cohen, Joutz and Loungani, Energy Policy, 2011 (with some updates)
Calls for energy ‘independence’

Indices of diversification in net imports

\[ CSI = \sum_i \left( \frac{NPI_i}{C} \right)^2 \times 100 \]

\[ NPI_i = \max \{0, M_{ij} - X_{ij} \} \]
Global Oil Diversification
Global Gas Diversification
Diversification index for natural gas
# Diversification: the bottom-line

<table>
<thead>
<tr>
<th>Vulnerability</th>
<th>Natural Gas</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1 to 6 France, US, UK 7 to 13 Spain, Portugal 14 to 19 Sweden</td>
<td>1 to 8</td>
</tr>
<tr>
<td>Medium</td>
<td>7 to 13 Austria, Germany, Japan, Ireland 14 to 19 Switzerland, Czech Republic, Finland, Greece, Slovak Republic</td>
<td>9 to 18</td>
</tr>
<tr>
<td>High</td>
<td>14 to 19 Belgium, Poland 19 to 26 Czech Republic, Finland, Greece, Slovak Republic</td>
<td>19 to 26</td>
</tr>
</tbody>
</table>

Source: Cohen, Joutz and Loungani, *Energy Policy*
C. Impact of U.S. Energy Boom

- Takeaway Message:
  “Don’t Get Carried Away by the Shale Gale”

-- Loungani and Matsumoto (forthcoming), Decoupling of Oil and Natural Gas Prices: Long Separation or Permanent Split?
-- U.S. 2012 Article IV consultation (July 2013),
Co-movement of Oil & Gas Prices …

(index; 2005 = 100, January 1993 to December 2005)

1a. United States: Gas, Oil

1b. Germany: Gas, Oil

1c. Gas: United States, Germany

1d. Oil: United States, Germany

Source: Loungani and Matsumoto, 2014
... but a decoupling since 2005

(index; 2005 = 100, January 2006 to February 2013)

2a. United States: Gas, Oil

2b. Germany: Gas, Oil

2c. Gas: United States, Germany

2d. Oil: United States, Germany

The U.S. Manufacturing Rebound …
...is not due solely to lower U.S. natural gas prices

Two other factors:

- The US real effective exchange rate has depreciated over the last decade, in particular against emerging-market currencies.

- Unit labor costs in the US have decreased relative to emerging markets.
Global Economic Model (GEM) simulations:
increase in U.S. energy production over the next 12 years by 1.8% of GDP, cumulatively

Source: IMF staff calculations.
Medium-term impact refers to impact after 13 years.
Medium-Term Impact of U.S. Energy Boom on Others

Global Economic Model (GEM) simulations: increase in U.S. energy production over the next 12 years by 1.8% of GDP, cumulatively.

Impact on the Rest-of-World GDP (percent)

Emerging Asia: 0.5
Euro Area: 0.4
Japan: 0.3
Latin America: 0.2
Remaining Countries: -0.3

Source: IMF staff calculations.
Medium-term impact refers to impact after 13 years.
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