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
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

- Oil Supply DI
Global Gas Diversification
Diversification index for oil

Denmark
Canada
Australia
United Kingdom
United States
France
New Zealand
Spain
Portugal
Italy
Netherlands
Germany
Korea
Austria
Ireland
Japan
Sweden
Belgium
Turkey
Greece
Switzerland
Czech Republic
Finland
Poland
Hungary
Slovak Republic
Diversification index for natural gas
# Diversification: the bottom-line

<table>
<thead>
<tr>
<th>Vulnerability</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1 to 6</td>
</tr>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>7 to 13</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>14 to 19</td>
</tr>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Low</td>
<td>France, US, UK</td>
</tr>
<tr>
<td>Medium</td>
<td>Italy</td>
</tr>
<tr>
<td>High</td>
<td>Belgium, Poland</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”

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Loungani and Matsumoto (forthcoming), Decoupling of Oil and Natural Gas Prices: Long Separation or Permanent Split?
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.
Medium-Term Impact of U.S. Energy Boom on the U.S.

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 United States
(percentage)

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)

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