Energy and the Macroeconomy:

the role of natural gas and the U.S. energy boom

Presentation by Prakash Loungani
Advisor, Research Department, IMF
Head of Commodities Team

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

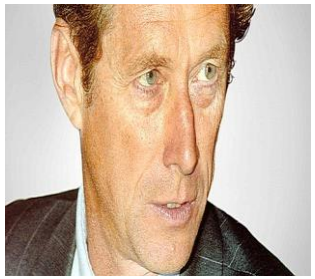
hamilton

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

Kilian

- 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



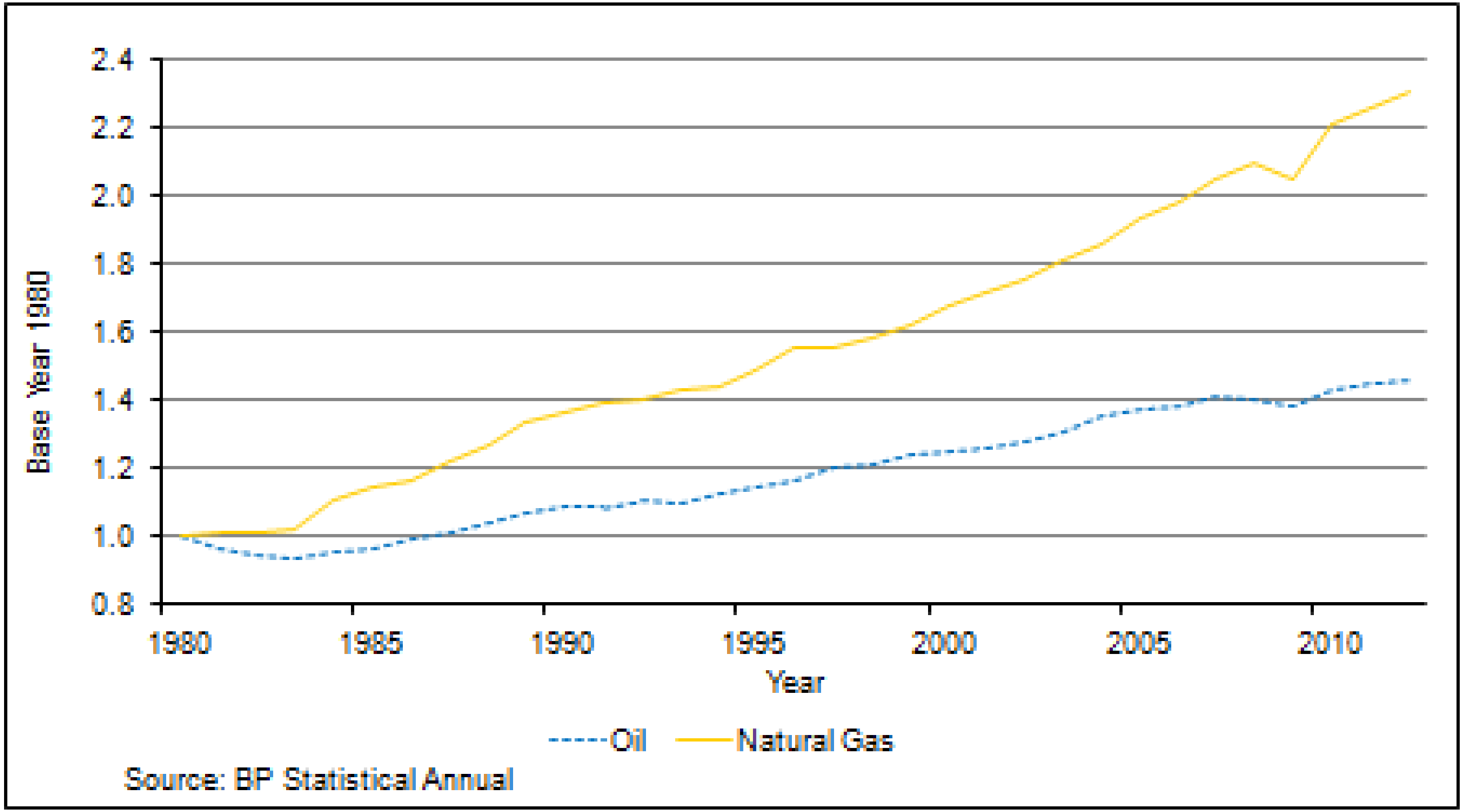
- Oil price shocks did play an important role in the stagflation of the 1970s
- But there have been changes since:
  - Our luck may have changed for the better
  - Real wages are less rigid
  - Monetary policy response is better
  - Share of oil in production & consumption is lower

- 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)

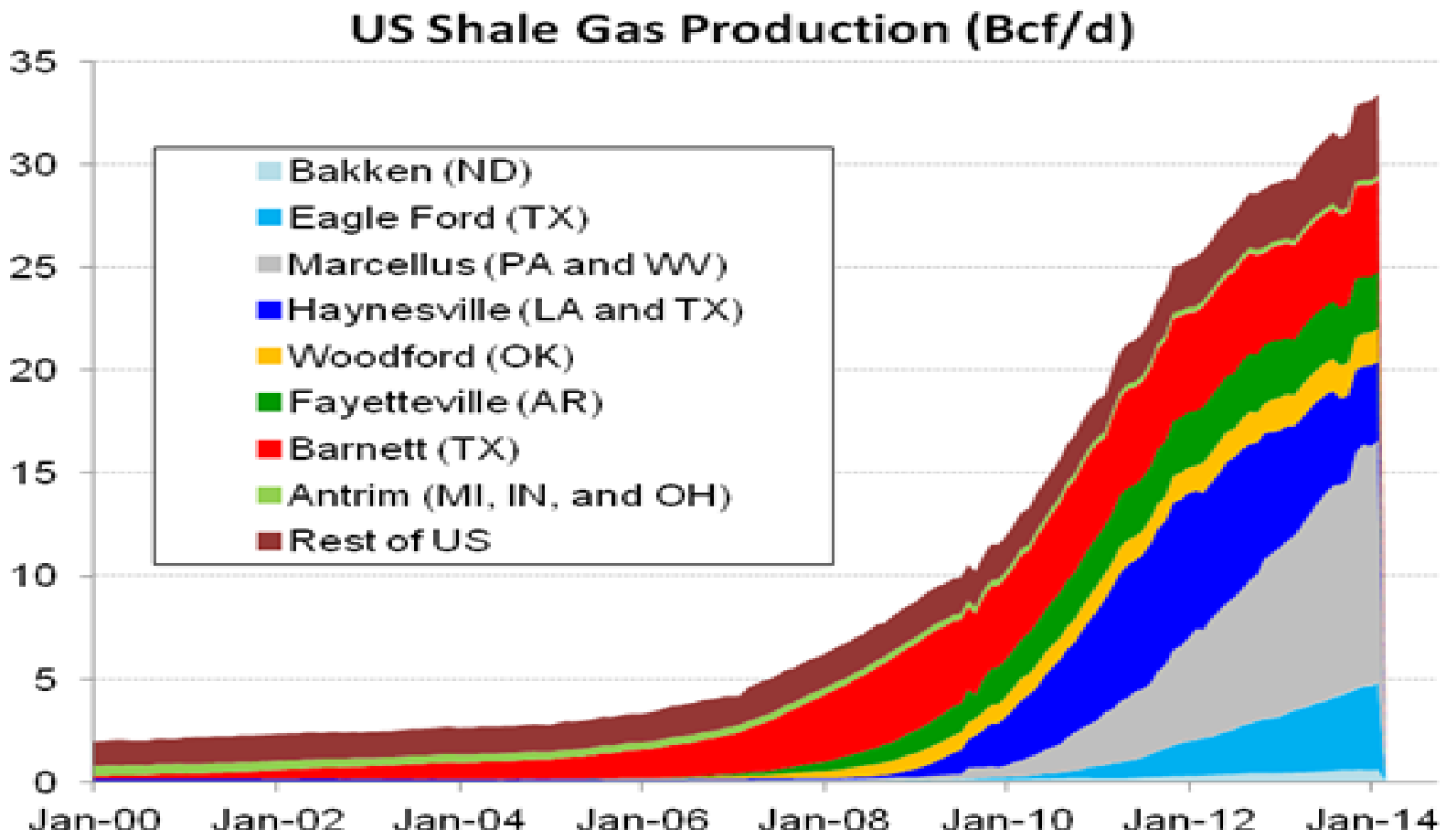
Some new developments

- 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



U.S. Energy Boom



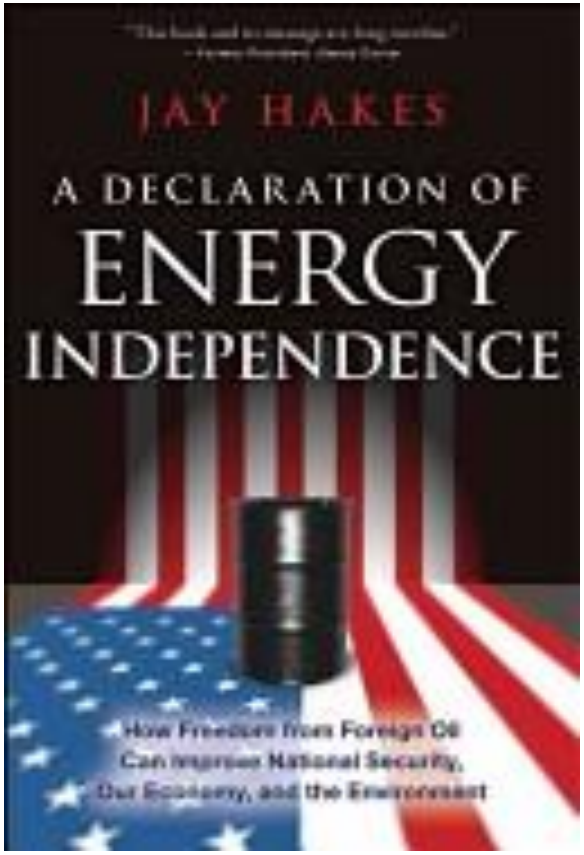
B. Measuring Diversification

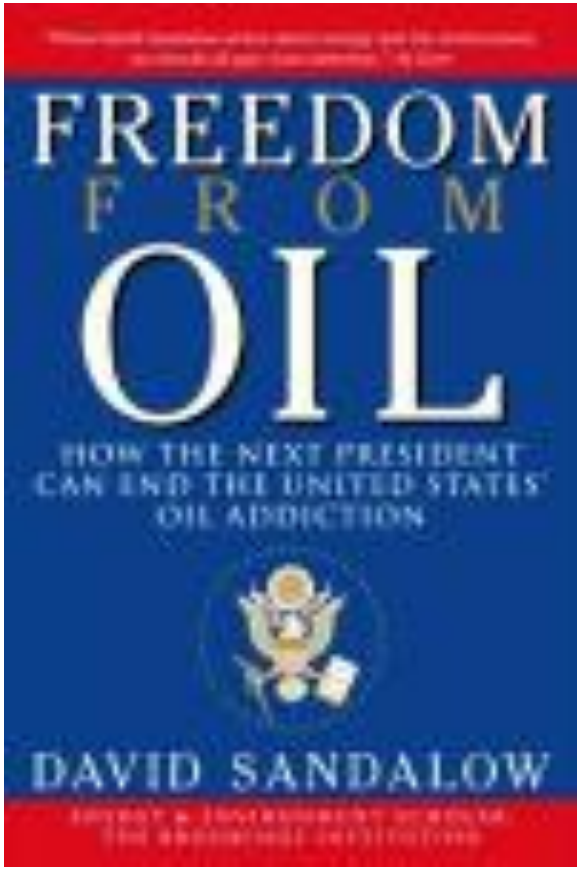
- Takeaway Message: “Depend, but Diversify”

(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’





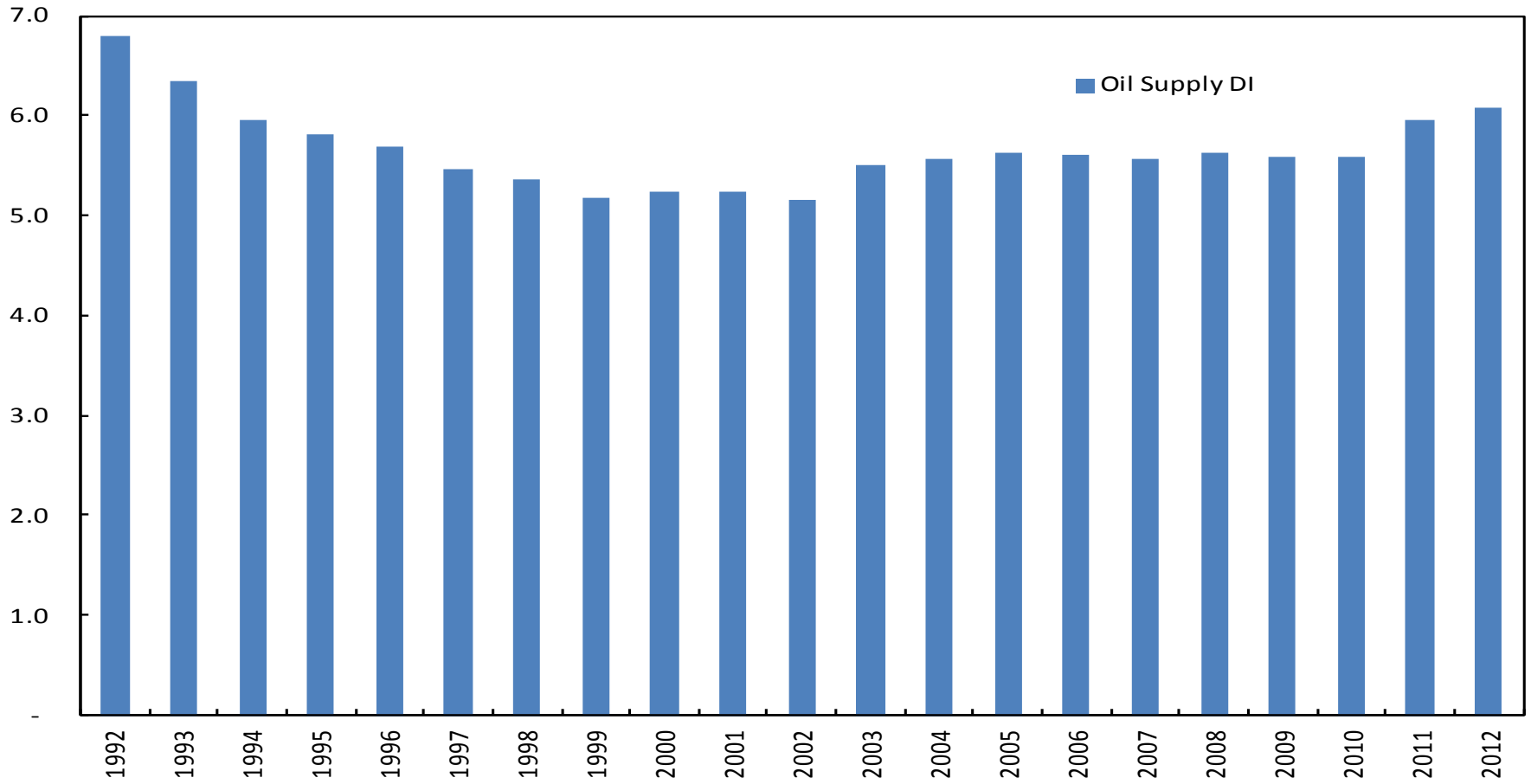
See Loungani (2009), “The Elusive Quest for Energy Independence,” *International Finance*, for a review of these books

Indices of diversification in net imports

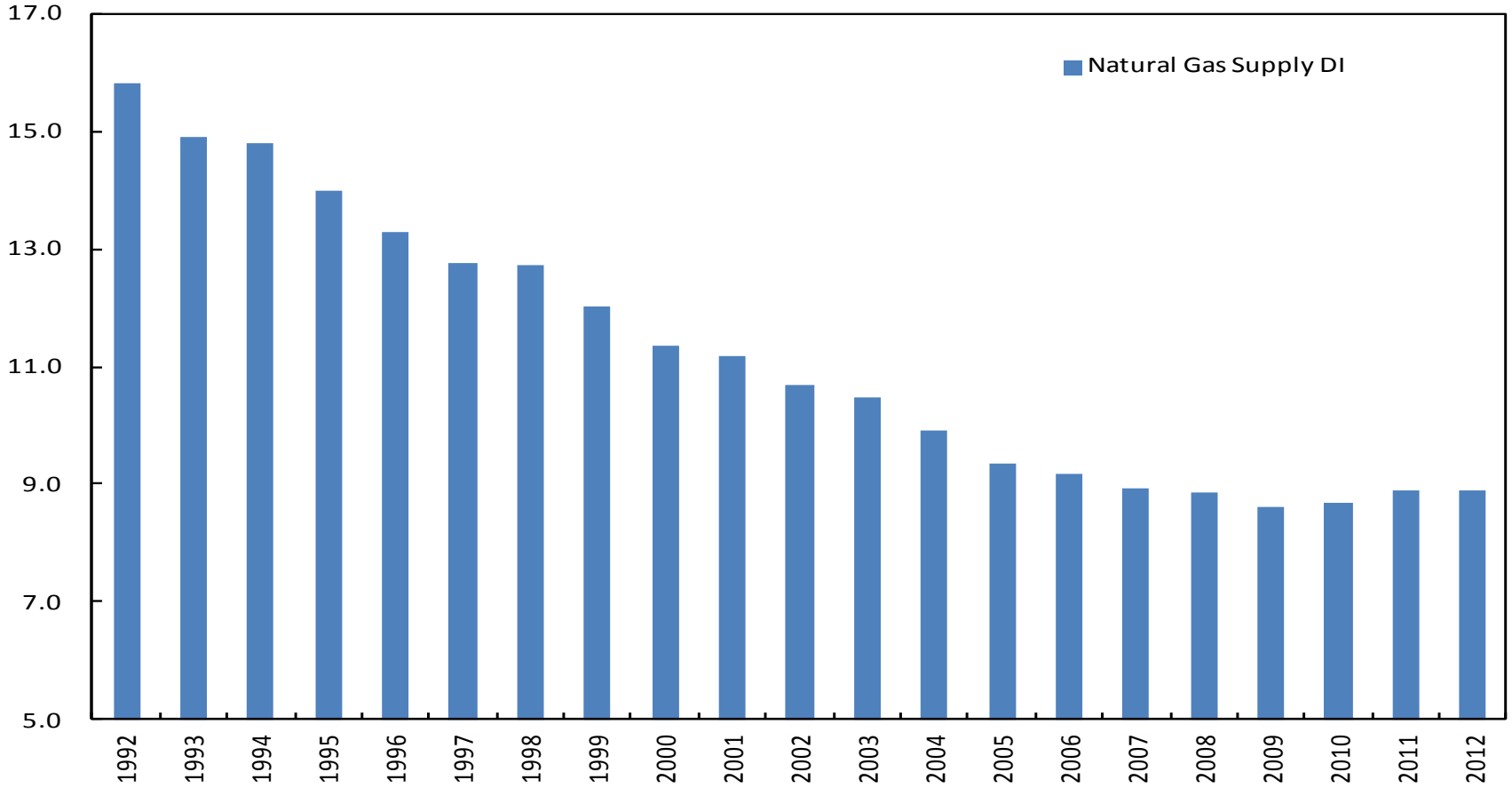
$$CSI = \sum_i \left(\frac{NPI_i}{C}\right)^2 * 100$$

$$NPI_i = \max\{0, M_{ij} - X_{ij}\}$$

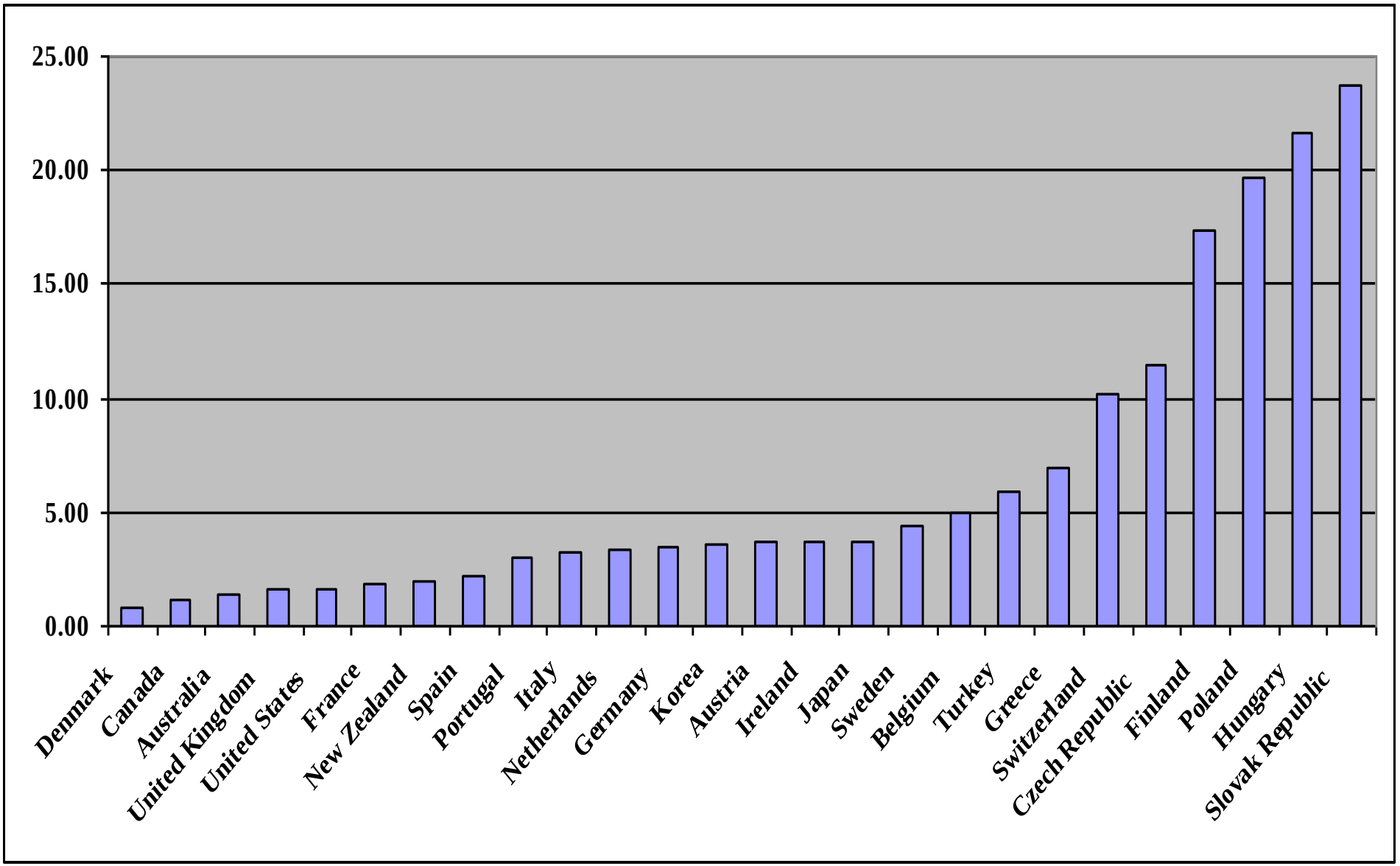
Global Oil Diversification



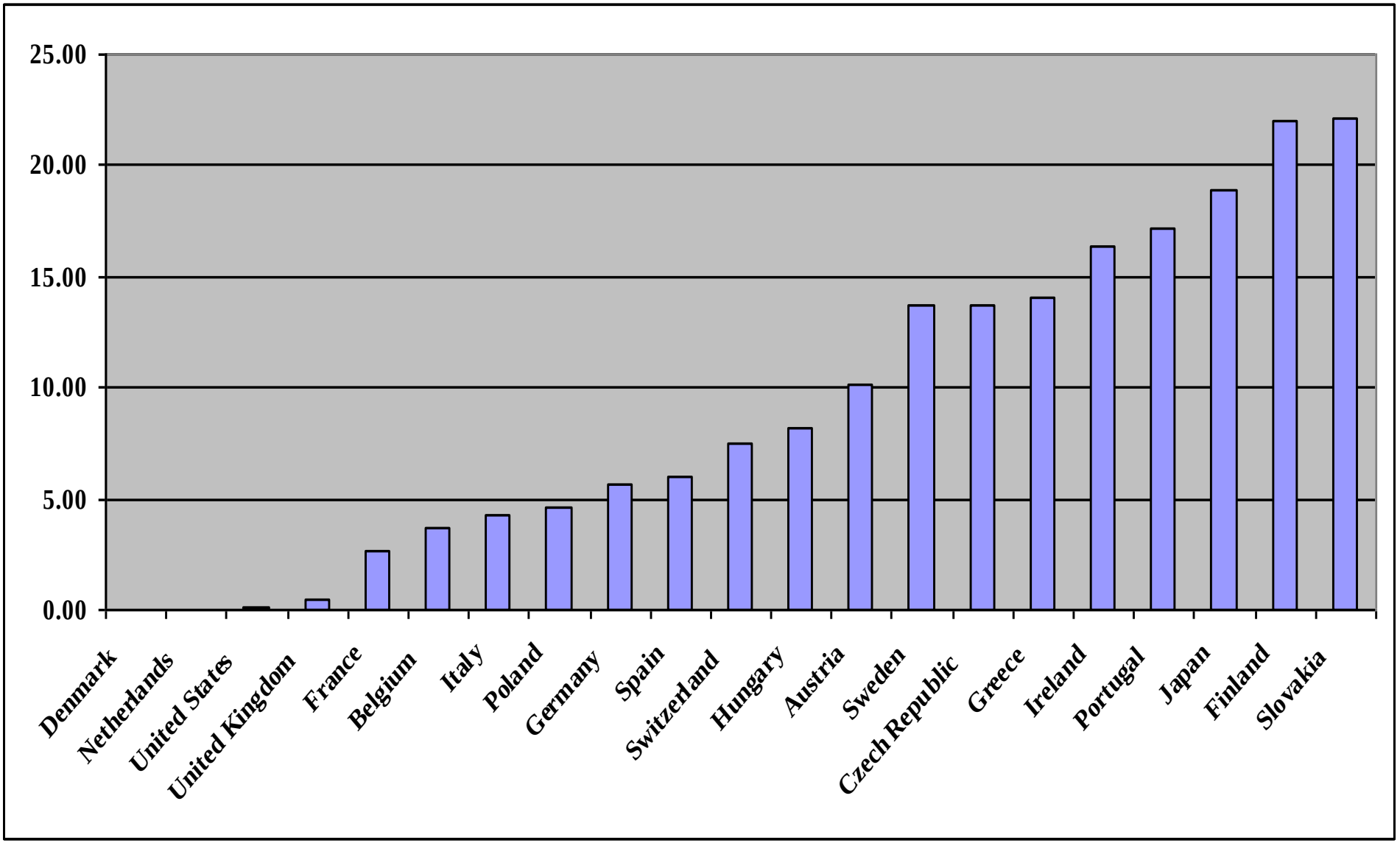
Global Gas Diversification



Diversification index for oil



Diversification index for natural gas



Diversification: the bottom-line

-

Natural Gas

Crude Oil	Vulnerability	1 to 6 Low	7 to 13 Medium	14 to 19 High	Ranking
	Low	France, US, UK	Spain, Portugal		1 to 8
	Medium	Italy	Austria, Germany, Japan, Ireland	Sweden	9 to 18
	High	Belgium, Poland	Switzerland, Hungary	Czech Republic, Finland, Greece, Slovak Republic	19 to 26

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"

--

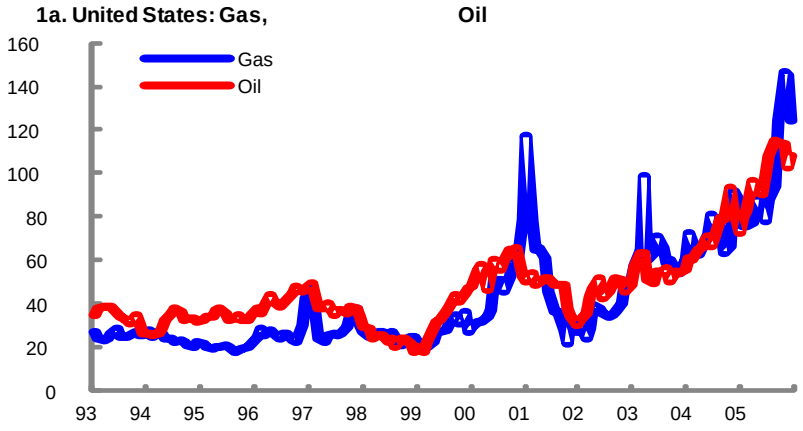
Loungani and Matsumoto (forthcoming), Decoupling of Oil and Natural Gas Prices: Long Separation or Permanent Split?

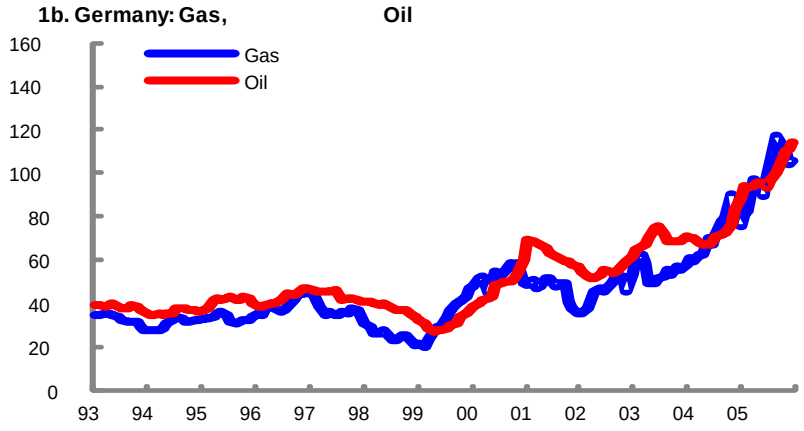
-- Celasun, Oya, Gabriel di Bella, Tim Mahedy, and Chris Papageorgiou (2014), "The US Manufacturing Recovery: Uptick or Renaissance?", IMF Working Paper 14/28.

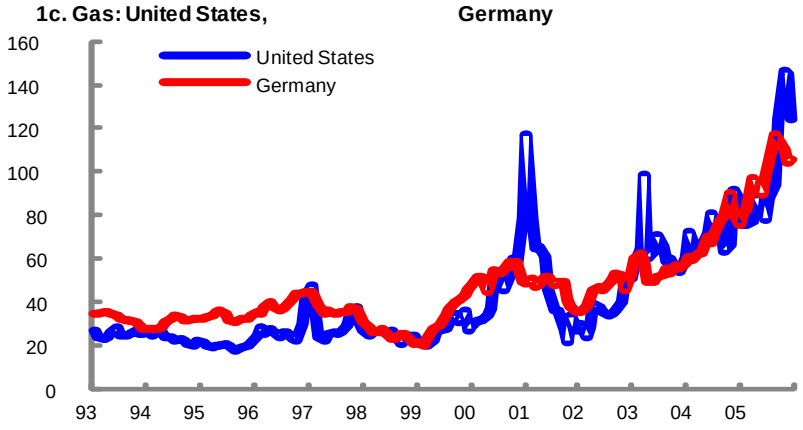
-- U.S. 2012 Article IV consultation (July 2013), http://www.imf.org/external/pubs/ft/scr/2013/cr13237.pdf

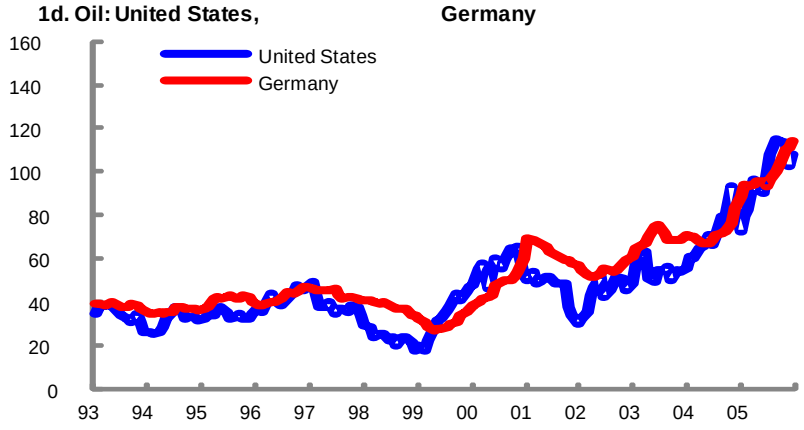
Co-movement of Oil & Gas Prices …

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







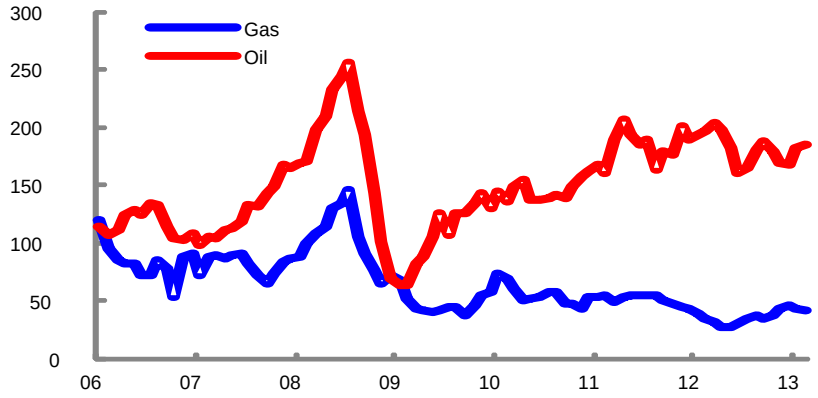


Source: Loungani and Matsumoto, 2014

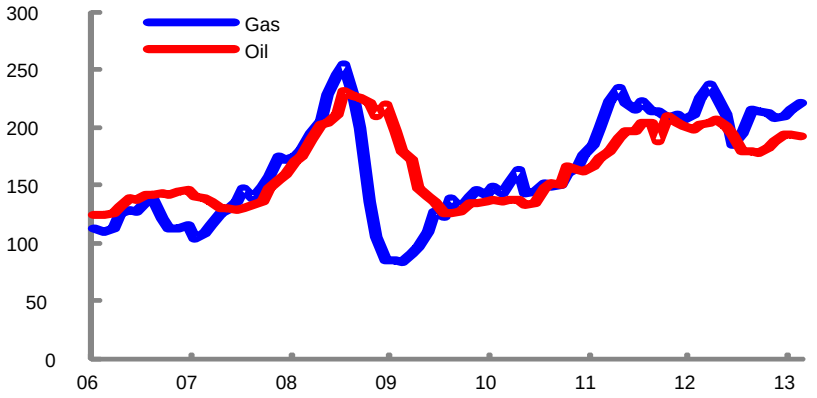
… but a decoupling since 2005

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

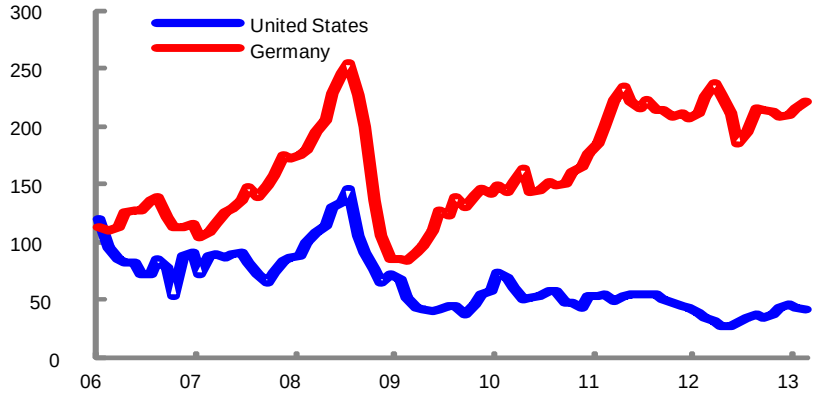
2a. United States: Gas, Oil



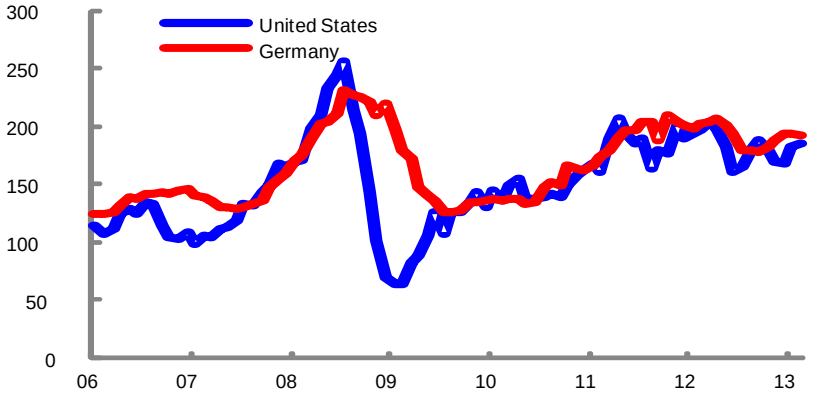
2b. Germany: Gas, Oil



2c. Gas: United States, Germany

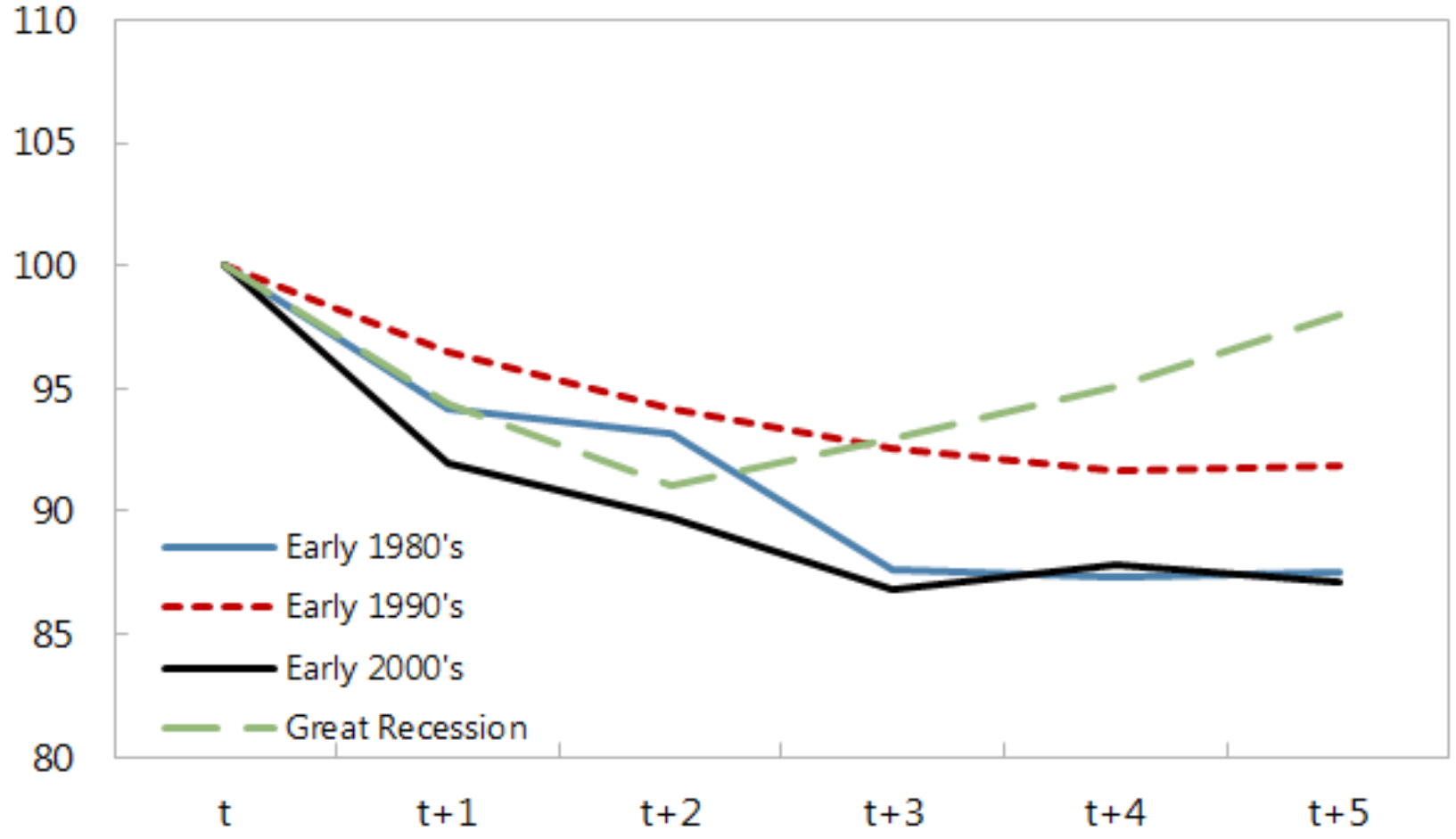


2d. Oil: United States, Germany



Sources: U.S. Bureau of Labor Statistics; Federal Statistic Office (Germany).

The U.S. Manufacturing Rebound …



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

Two other factors:

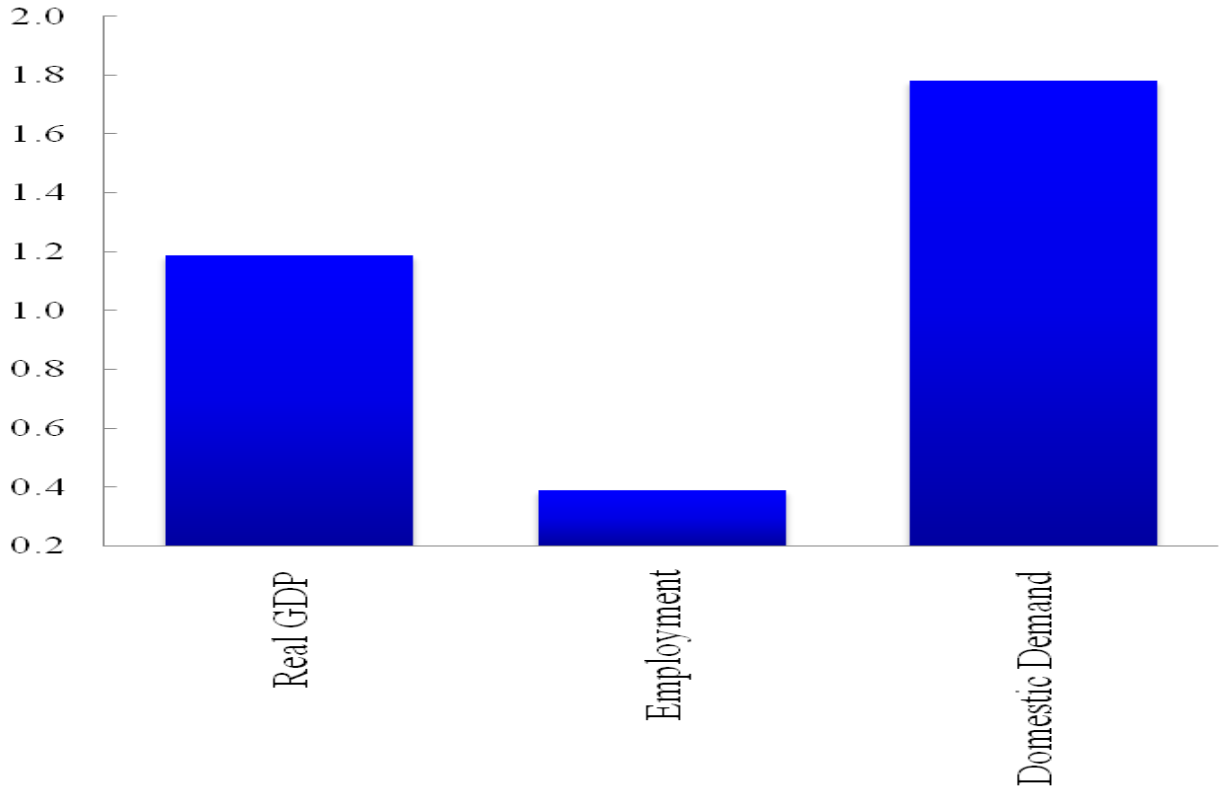
- The US real effective exchange rate has depreciated over the last decade, in particular against emerging-market currencies.

- 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

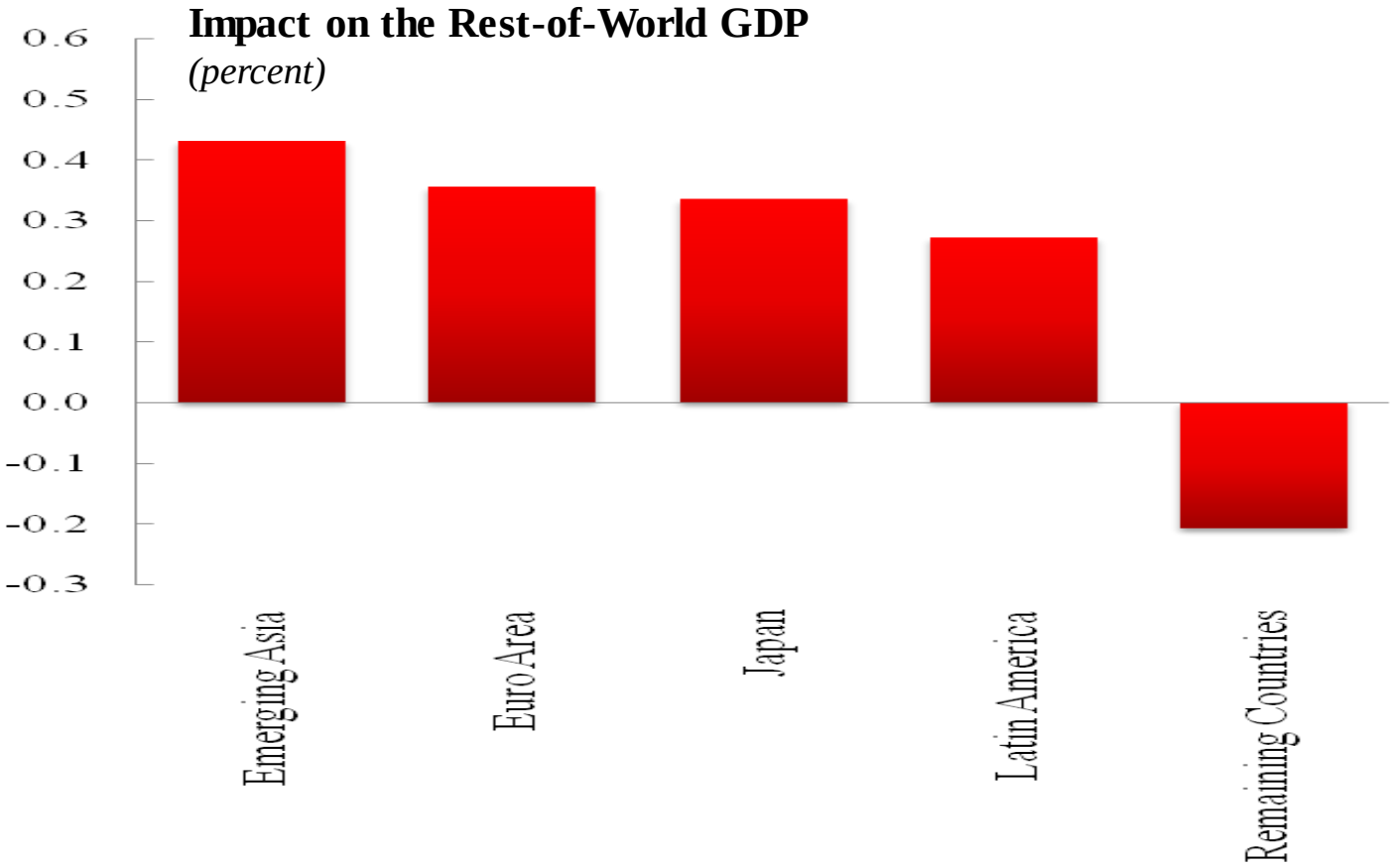
Impact on the United States
(percent)



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



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

Thank you
& shameless self-promotion

- Visit our website:
  http://www.imf.org/external/np/res/commod/index.aspx

- Some of our products:
  - **Commodities Market Monthly**
    http://www.imf.org/external/np/res/commod/pdf/monthly/060114.pdf
  - **Commodities Price Outlook & Risks**
    http://www.imf.org/external/np/res/commod/pdf/cpor/2014/cpor0514.pdf

- IMF Commodities Team: Prakash Loungani, Rabah Arezki, Akito Matsumoto, Shane Streifel, Marina Rousset, Daniel Rivera Greenwood, Hites Ahir