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Overview

I. Background on the project

II. Literature review
   A. Oil shocks and the economy
   B. Relevance to a Persian Gulf disruption

III. The impact of changing market conditions
   A. The price response to a Persian Gulf shock
   B. The economic impact of a shock

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Crude Calculus: Reexamining the Energy Security Logic of America’s Military Presence in the Persian Gulf

• Edited volume sponsored by the Institute for Security and Conflict Studies at George Washington University

• Two core questions:
  – Should the United States remain in the Persian Gulf to preserve the flow of oil?
  – If so, what should the American military and political presence look like?

• This chapter’s role in the book
  – Not an evaluation of the likelihood of any particular threat
  – Assessment of the potential economic impact of a Persian Gulf disruption grounded in the energy economics literature
Key Issues in the Literature

• Do oil supply shocks impact the macroeconomy?
• How do demand and supply shocks differ?
• What is the relevant mechanism?
• What is relative importance of monetary policy?
• How has this relationship changed over time?
• How do these impacts vary across countries?
• What is the magnitude of this relationship?
Do oil supply shocks (substantially) impact the macroeconomy?

• Yes
  – Balke, Brown, and Yücel (2002)
  – Hamilton and Herrera (2004)

• No
  – Bohi and Toman (1996)
  – Hooker (1996)

Relevance: Understanding the relationship
How do demand and supply shocks differ?

- Price increases of the 2000’s were less harmful because the were driven by demand shocks
  - Balke, Brown, and Yücel (2010)
  - Peersman and Van Robays (2012)
- Kilian’s innovation: supply shocks vs. demand shocks vs. precautionary demand shocks

Relevance: A major Persian Gulf disruption would cause either cause a supply shock or a precautionary demand shock
What is the relevant mechanism?

• Inflation and monetary policy
• Reallocation of labor and capital across sectors
• Demand/consumption reduction
  – Reduced purchasing power
  – Postponed purchases of durables
  – Precautionary saving
  – Decreased consumer confidence
• Investment Reduction
  – Lost demand input costs
  – Inflation expectations and uncertainty

Relevance: The uncertainty impacts of a large Persian Gulf supply disruption would likely be severe
What is relative importance of monetary policy?

• Bernanke, Gertler, and Watson (1997) find that contractionary policy in the wake of oil shocks explains the decline in economic activity

• Numerous articles challenge this result
  – Brown and Yücel (1999)
  – Hamilton and Herrera (2004)
  – Kilian (2009)

Relevance: In the near future, it is unlikely that a major oil supply shock would trigger a highly contractionary monetary response
How has this relationship changed over time?

- The asymmetry and stability debates
- Many argue that the relationship has moderated
  - Herrera and Pesavento (2009)
  - Edelstein and Kilian (2009)
  - Blanchard and Galí (2010)
- Possible explanations
  - Reduced labor market rigidity
  - Increased monetary credibility
  - Reduced role of oil in the economy
  - Changing structure and relevance of the auto industry
- Jiménez-Rodríguez and Sánchez (2009) show that shocks cause more harm in a stable price environment

Relevance: Most of these trends point to reduced U.S. vulnerability
How do these impacts vary across countries?

• Many studies show substantial cross-national differences in the sensitivity to oil price shocks
  – Cologni and Manera (2008)
  – Kilian (2008)
  – Du, Yanan, and Wei (2010)
  – Peersman and Van Robays (2012)
• Possible explanations
  – Varying monetary policy responses
  – Position in the global economy
  – Level of energy- and oil-intensity of GDP

Relevance: While U.S. trends in these areas are favorable, secondary effects caused by the impact of an oil supply shock on trading partners could be severe – a major supply shock has yet to occur in the current demand environment
What is the magnitude of this relationship?

- Brown and Huntington (2010) develop a composite elasticity of the oil price response to a shock (-0.136)
- Estimates of the GDP response to oil price shocks varies
  - Basic range is from (-0.01 to -0.12)
  - Consensus average is about (-0.05)
- Estimates of the impact of oil prices on GDP tend to be higher in econometric models
- New research suggests the number could be lower (-0.01)

Relevance: Assessing the price impact of a Persian Gulf disruption is more art than science; assessing the GDP impact will entail major uncertainty
Changing Market Conditions

• Geopolitical trends in the region
  – The Arab awakening
  – Iran’s nuclear ambitions
  – Demographic pressures

• Tightness in the current market
  – Minimal spare capacity – located in the Persian Gulf
  – Expanding Non-OECD demand

• Changes in the North America petroleum landscape
  – Canadian production and expanding U.S. market share
  – Significant increases in U.S. production
  – Moderating U.S. consumption
A Framework for Assessing Vulnerability

• Developed by Duffield (2008)
• Size and likelihood of an oil shock
  – Geographical concentration of supply
  – Availability of spare production capacity
  – Stability of producing countries and regions
  – Strategic petroleum stocks
  – Market mechanisms
• Economic impact of a shock
  – Oil intensity of the U.S. Economy
  – Government policy responses
  – Demand elasticity of oil
Size and Likelihood of a Shock

Projected Total World Liquids Production (2009-2035)

Source: U.S. Energy Information Administration
Size and Likelihood of a Shock

Global Oil Consumption and Spare Production Capacity (1980-2013)

Sources: U.S. Energy Information Administration and the International Monetary Fund
Size and Likelihood of a Shock

• **Stability of producing countries and regions**
  – Conflicts could spread or intensify
  – Potential for resource nationalism (Jaffe and Miller 2012)
  – Increasing fiscal pressures

• **Strategic petroleum stocks**
  – Declining OECD demand increases the effective coverage
  – Non-OECD stocks could add to this capability

• **Market mechanisms**
  – Relevance of the fear premium?
Economic Impact of a Shock

Projected U.S. Liquids Intensity of GDP (2009-2035)

Source: U.S. Energy Information Administration
Economic Impact of a Shock

• Policy responses
  – Minimal emergency demand-side response capability

• Demand elasticities
  – Still minimal in the short-term
  – Demand reaction/response would be uncertain in the event of a major Persian Gulf supply shortage

• The Literature on this topic points to decreasing, but significant vulnerability in this area
What about domestic production?

Source: U.S. Energy Information Administration
Conclusions

• **Net assessment**
  – Current global market trends are elevating both the likelihood and potential severity of an oil supply shock
  – The U.S. is becoming more resilient – consumption trends are the most important component of this

• **Questions for further research**
  – What role could cooperation with non-OECD oil importers play in decreasing the vulnerability to global oil supply shocks?
  – Under what conditions could the U.S. reduce its linkages with the broader world oil market?
  – Under what conditions would permanent demand destruction take place?