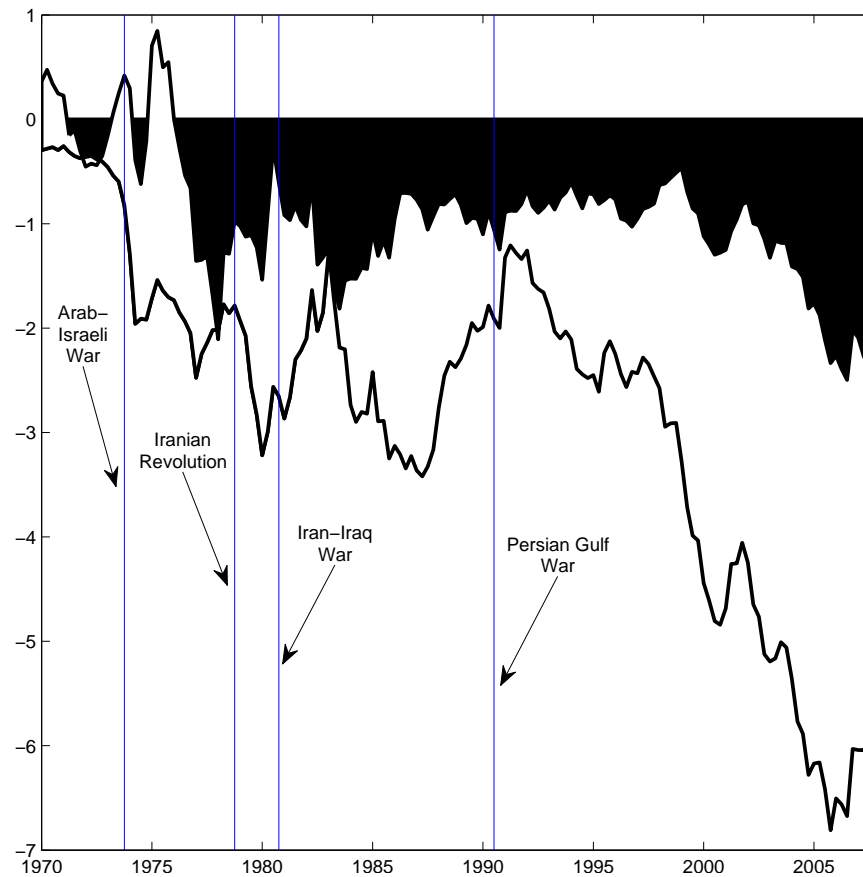# Oil Shocks and U.S. External Adjustment
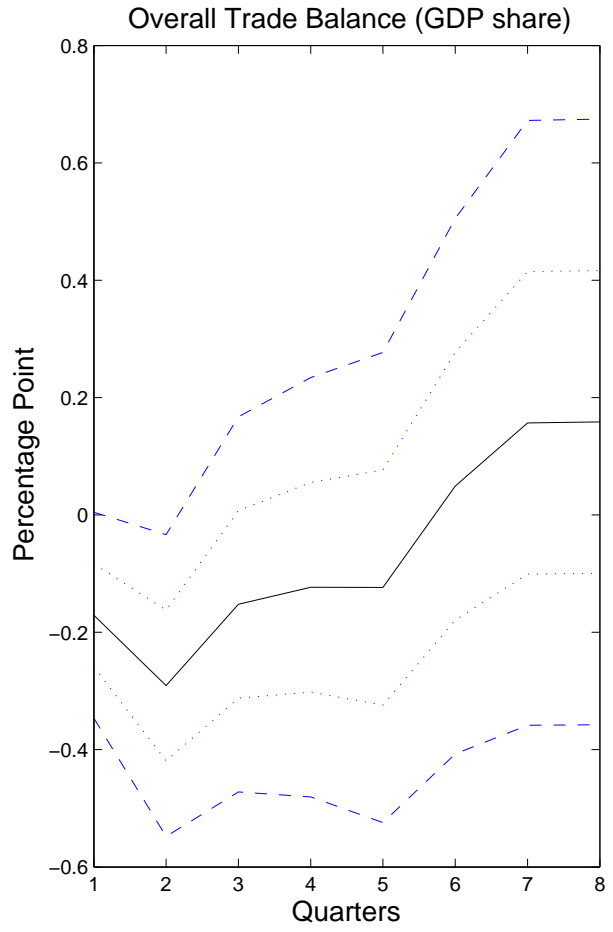
Martin Bodenstein, Christopher Erceg, Luca Guerrieri
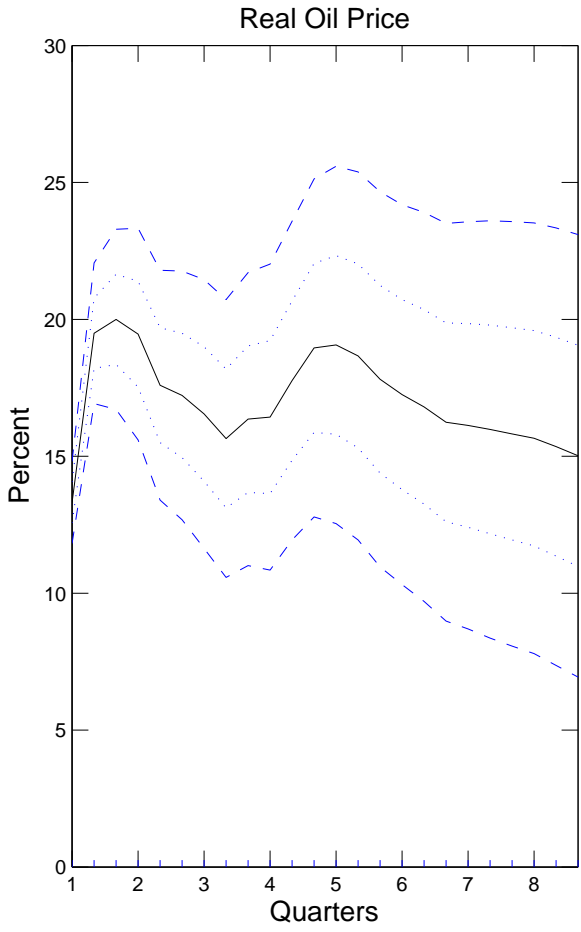
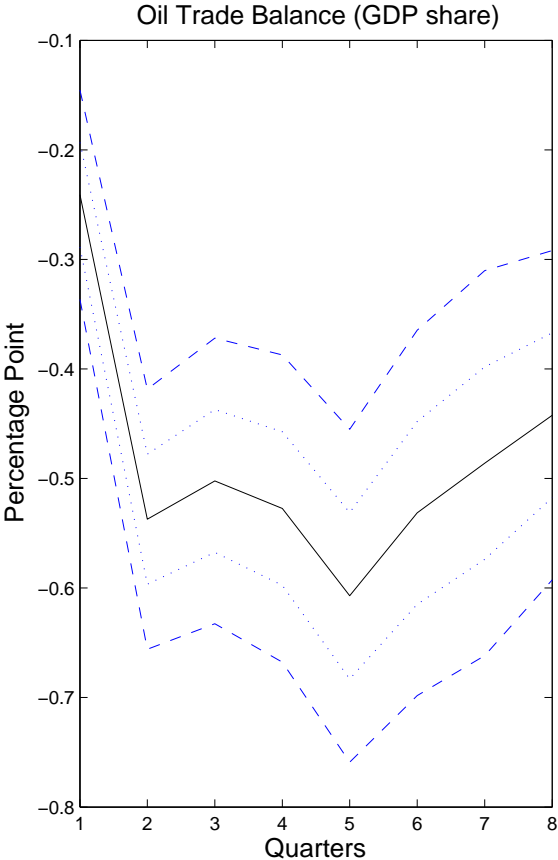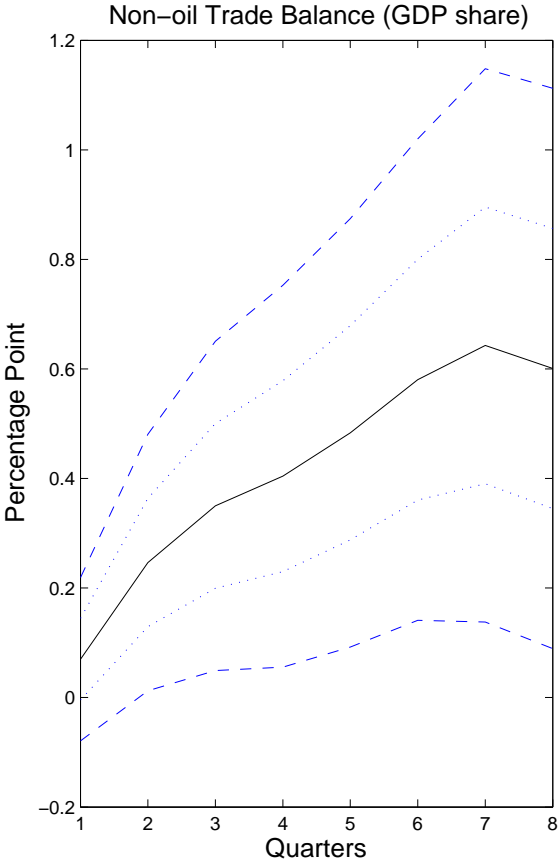Division of International Finance, Federal Reserve Board

April 2008

Net Exports of Petroleum and Products and Goods Trade Balance
(percent share of GDP, 1970q1-2007q4)

Effects of An Oil Demand Shock that Drives the Price of Oil Up by 20%
(Linear Estimator)

Real Oil Price

Overall Trade Balance (GDP share)

Effects of An Oil Demand Shock that Drives the Price of Oil Up by 20%
(Linear Estimator)

Non−oil Trade Balance (GDP share)

Oil Trade Balance (GDP share)

Effects of An Oil Shock that Drives the Price of Oil Up by 20% (Nonlinear Estimator)

Oil Price Response

Overall Trade Balance Response
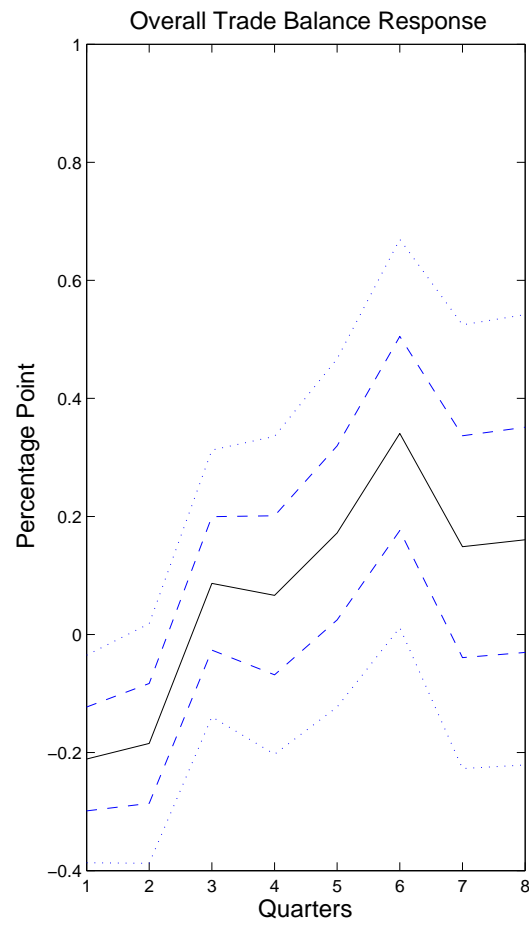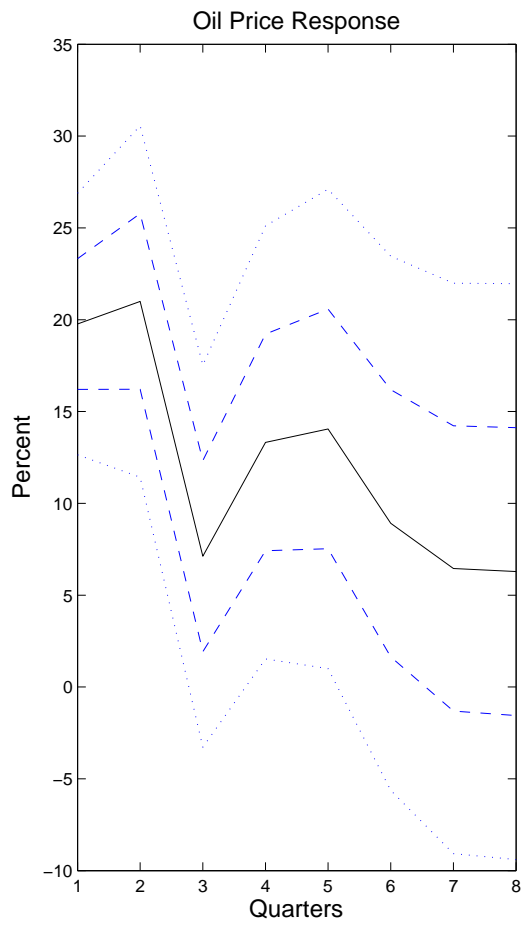
Effects of An Oil Shock that Drives the Price of Oil Up by 20%
(Nonlinear Estimator)
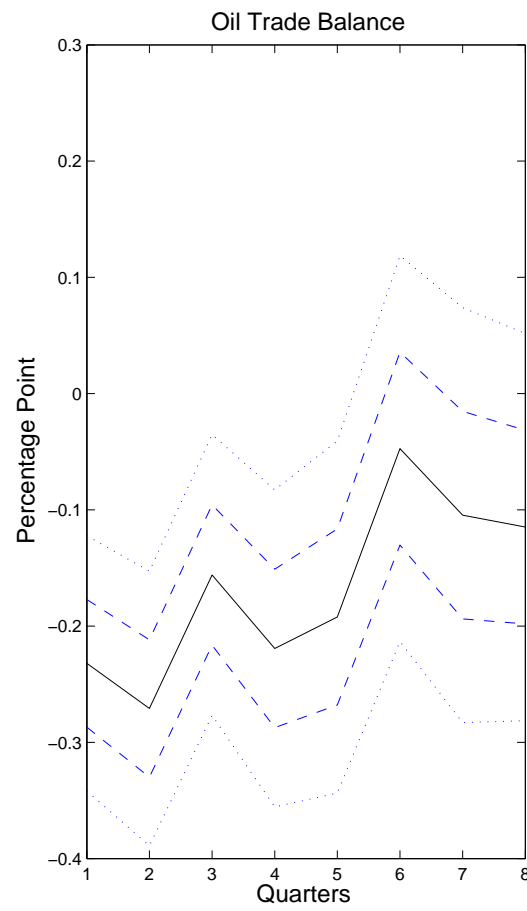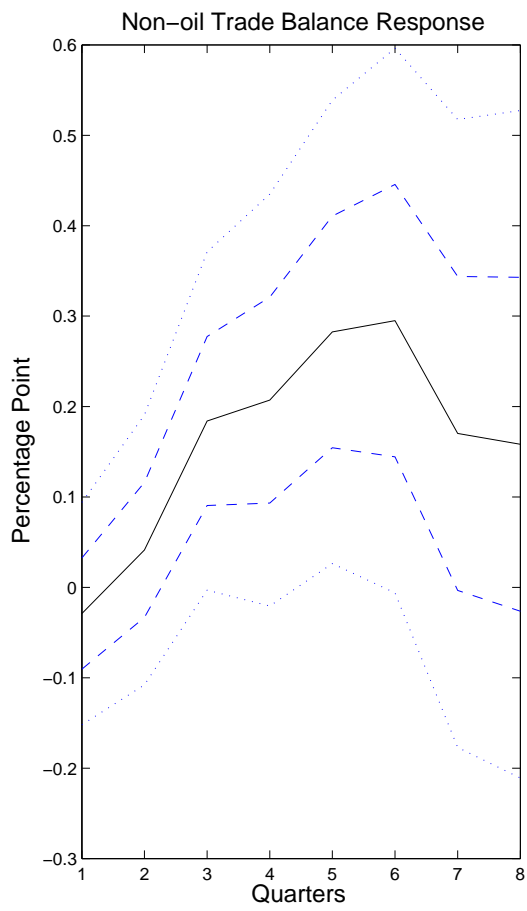
What's in the rest of the paper?

- Build a model that can generate an improvement in the non-oil trade balance subsequent to an oil shock that raises the price of oil

- We use a Hicks-style decomposition into substitution and wealth effects to justify our claim

- Driving force behind this finding are differential wealth effects in the oil importing versus the oil exporting country

- We highlight that wealth effects are dependent principally on oil price elasticity of demand and incomplete financial market arrangements

Our Model

Analysis builds on Backus, Kydland and Kehoe (1992) and Backus and Crucini (1998):

- standard two-country model of the international business cycle that is augmented by oil

- each country receives an oil endowment every period; one country is imports

- oil demand has a time-varying price elasticity

- international financial markets are incomplete (one non state contingent bond)

The oil-price elasticity of demand

- The oil price elasticity of demand is one of the key factors influencing our results

- We estimate the oil demand equations from our theoretical model

- Estimates imply a long-run elasticity of 0.5, an impact elasticity of 0.025, and a half-life of 10 years, but standard errors are large

- We study the effects of alternative shocks, oil demand, oil supply, oil price shocks

    - Interaction between oil and non-oil trade balance independent of whether the shocks are coming from the demand or supply

- Evolution of trade balance minimally influenced by monetary policy in a sticky price/wage variant of our model