OIL PRICES AND THE WORLD ECONOMY

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Introduction

• Oil price increases and inflation were associated in the 1970’s and 1980’s
  – What factors affect oil prices
  – What makes oil prices ‘cause’ inflation
  – How do higher oil prices affect the level of output

• Why is the world different
What affects output and inflation

- The oil intensity of production
- Nominal inertia in wages and prices
- The monetary policy response
- The speed of recycling oil revenues into demand
- Patterns of trade have an important influence
What should modellers and forecasters look at

• Temporary and permanent shocks differ
  – Expectations influence the impact of shocks
  – The effects on long term interest rates differ
• The use of oil revenues influences outcomes
  – Oil shocks redistribute income flows
  – The effects on trade in goods and services determine the pattern of effects
  – So include oil producers and trade in services
The Role of OPEC

• OPEC is a lead producer, but it only sets a floor to prices
  – A positive output gap in the OECD puts upward pressure on prices

• Real oil prices display dollar inertia because OPEC sets dollar prices
  – The real oil price is influenced by movements in the dollar real exchange rate
  – Recent price increases have been much less marked in euros
Oil Intensity

• The amount of oil per unit of GDP has been falling since 1975
  – In Europe oil intensity has fallen by one third since 1982
  – In the US oil intensity has fallen by as much
• Oil intensity is now 60 per cent higher in the US than in the major Euro Area countries
• The first round effect on output and prices must be higher in the US
Oil Intensity of Output
(barrels of oil per unit of real output at 1994 PPPs)
Oil as per cent of total energy supply
Oil Prices and Trade

• Oil prices affect the terms of trade
  – Higher dependence on oil imports raises the impact on GDP
    • The impact on saving and investment is greater
    • Tax revenues and solvency are affected

• Patterns of OPEC (Russian, Norwegian) imports affect the pattern of trade impacts
  – The US has 22% of world GDP but only 11 percent of major oil exporters imports
Share of Oil Producers’ Imports, 2000

Share of World GDP (at PPPs), 2000

- **US**: 22%
- **Japan**: 7%
- **Euro Area**: 17%
- **UK**: 3%
- **Asia excl. Japan**: 24%
- **Other**: 27%

- **US**: 11%
- **Japan**: 7%
- **Euro Area**: 26%
- **UK**: 6%
- **Asia excl. Japan**: 18%
- **Other**: 32%
The role of the labour market

• An increase in the oil price reduces equilibrium income for each level of output
• Real wages need to fall
  – Bargaining institutions may resist and induce a recession
  – The central bank may allow inflation to reduce output costs
  – There may be asymmetries between upward and downward shocks
• Labour market institutions are now more flexible than in the 1970s because of reforms
• Bargainers realise that real wages must change
• Hunt and Laxton NIER 2002 discuss these issues
Oil Prices and NiGEM

• The model is an estimated new Keynesian description of the world economy
  – Almost all OECD countries are covered
  – OPEC, and other regions are included
  – Trade and financial markets cover the world
  – Each country has a demand and supply structure with a government sector
  – Financial, exchange rate and labour markets have forward looking expectations
Monetary Policy Rules

• All countries must have monetary policy

• We have an ECB strategy with a nominal aggregate and inflation as targets

\[ r_t = \gamma_1 (\log(P_t Y_t) - \log(P_t Y_t^*)) + \gamma_2 (\Delta \log P_{t+j} - \Delta \log P_{t+j}^*) \]

• We also have a Taylor Rule (TR) whose coefficients can change

\[ r_t = \gamma_1 (\log Y_t - \log Y_t^*) + \gamma_2 (\Delta \log P_{t+j} - \Delta \log P_{t+j}^*) + \gamma_0 \]

• They have different implications for prices as TR treats inflation misses as a bygone
A permanent 25% rise in oil prices

- Output effects are similar in the long run for the US and the Euro Area
- Short run effects depend on oil intensity, trade links and labour markets
Impacts on Output of a 25% permanent rise in oil prices
Impacts on Inflation of a 25% permanent rise in oil prices
Long term effects of a 25% permanent rise in real oil prices

- Higher oil prices change the terms of trade for the OECD as a whole
- The saving investment balance has to change
- Real interest rates have to rise, and output will be lower in the long run
- The rise in long term real interest rates will affect output now
The impact of a 25% permanent real oil price increase on long rates

Percentage points difference from base

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<th>2005</th>
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<td>Euro Area long rate</td>
<td>0.24</td>
<td>0.25</td>
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<tr>
<td>Euro Area long real rate</td>
<td>0.18</td>
<td>0.19</td>
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<td>US Long Rate</td>
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<tr>
<td>US long real rate</td>
<td>0.25</td>
<td>0.26</td>
<td>0.25</td>
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Spending oil revenues

- Increased oil receipts are spent on goods and services imports, but only with a lag
- In the first two years aggregate demand is likely to be lower as OPEC adjusts
- Impacts of a 25% permanent increase in real oil prices

![Graph showing oil revenues and imports by year from 2005 to 2009]
Slower spending of oil receipts

- Until 1985 OPEC recycled money into goods at half the speed they now spend at so we cut the speed of reaction to half its level.

- Output effects of an oil price shock increase, especially in inertial Europe.
Impact of slower spending of oil revenues of trade
The role of monetary policy

- Short run effects on output also depend on policy – a looser monetary stance can half the impact on output
- Inflation effects depend on wage price flexibility and the policy rule
  - A looser monetary stance must mean a greater price impact
  - More real wage inflexibility raises the costs of keeping price effects small
Changing Policy in the US

- We compare our default with a looser response and output effects are smaller in the short run.
- Inflation effects are larger after the first year and the price level is noticeably higher in the long run than in the default.

Looser Monetary Policy in the US
Ratio of loose to tight

Effects of Loosening policy (loose/tight) Inflation

Effects of Loosening policy (loose/tight) Output
Long Run Impacts on US prices

% difference from baseline

--- Tight response  --- Loose response
Are temporary shocks different

- We compare a permanent shock to a 2 year shock under the same rules
- Temporary shocks have less output effects because real interest rates do not rise
- Inflation effects can be larger as a result
Conclusions

- Higher oil prices lead to higher prices
  - Output should fall in the short and long run
  - Real interest rates should rise
- Wage price spirals worsen problems
- Oil intensity is important for output effects
- Inflation depends on the central bank
  - Output effects can be reduced in the short run
- The speed of re-spending revenues on goods and services affects the impacts on output
Sources

Much of the argument is contained in
available at www.niesr.ac.uk
Al Eyd et al ‘The world economy’ in National Institute Economic Review July and October
Information available at www.niesr.ac.uk

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