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# **Oil Prices and the Exchange Rate: Optimal Monetary Policy for Oil Exporting Countries**

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***Day 1 Paper SC1***

Presented at REPOA's 23<sup>rd</sup> Annual Research Workshop  
held at the Ledger Plaza Bahari Beach Hotel, Dar es Salaam, Tanzania;  
April 4 – 5, 2018

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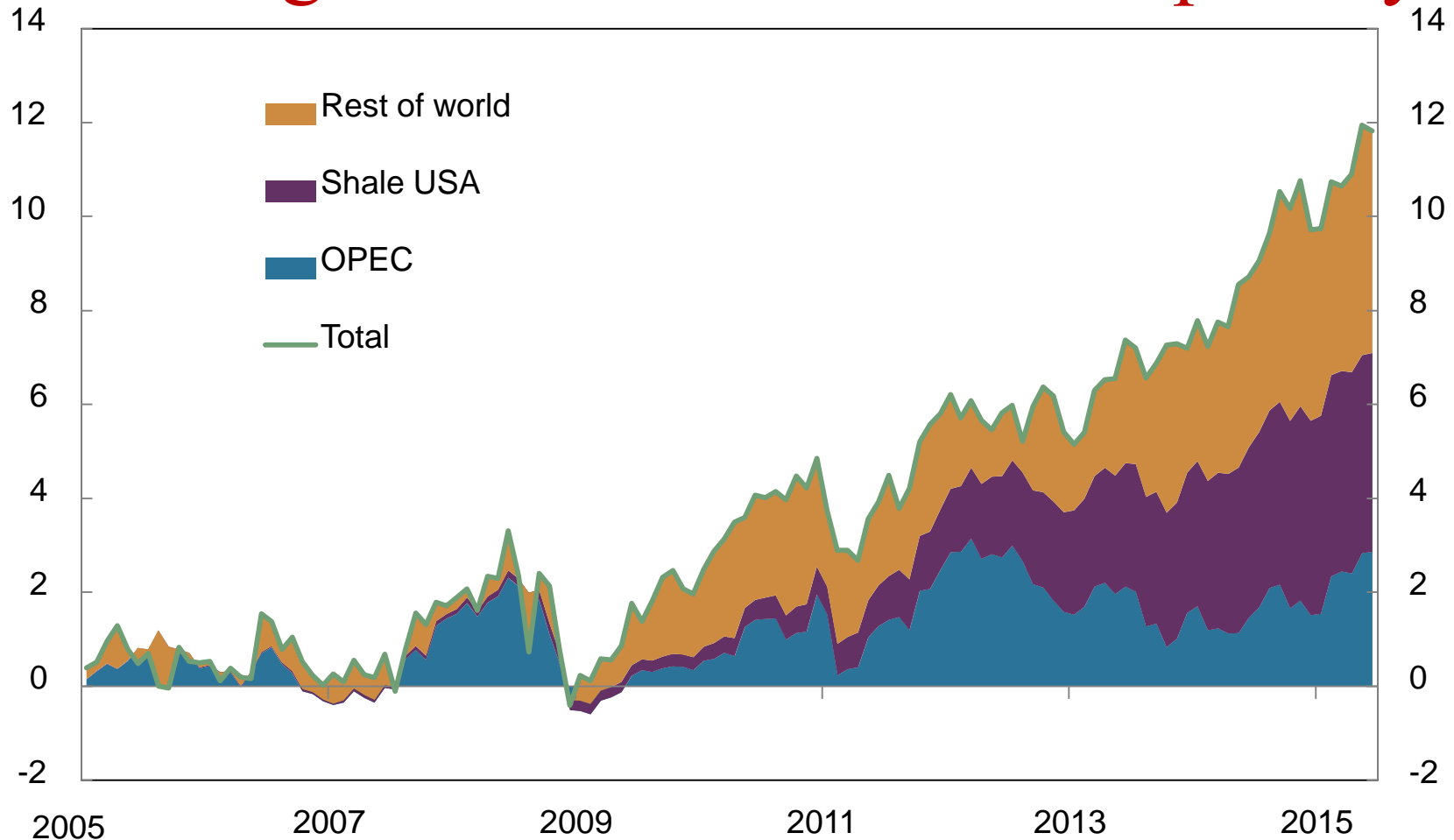
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# Oil Prices and the Exchange Rate: Optimal Monetary Policy for Oil Exporting Countries

Ragnar Torvik

Tanzania April 4 2018

# World petroleum supply since January 2015 – growth in millions barrels per day



# Oil supply and the US

- This is a **permanent** supply shock
- What will their marginal cost be?  $< 60$  USD
- New discoveries, new techniques, new countries

# How will this affect oil prices?

- New technology – when is it replaced?
- Will it spread?
- Yes: Top 5 shale oil as percentage of US:
  - Russia 129
  - China 55
  - Argentina 47
  - Libya 45
  - Venezuela 22

Source: US Energy Administration Information

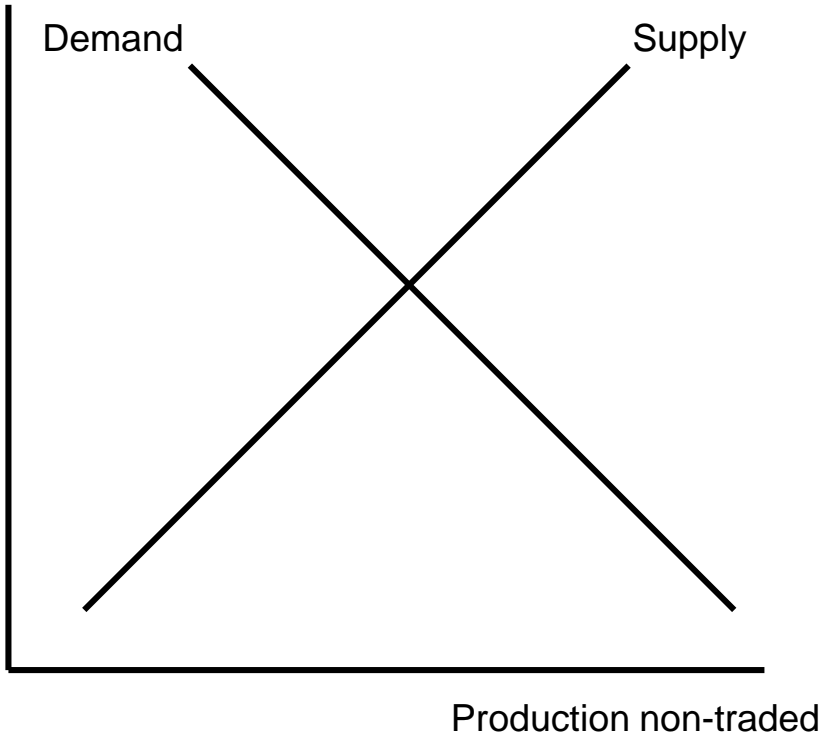
- What about shale gas?

# The model

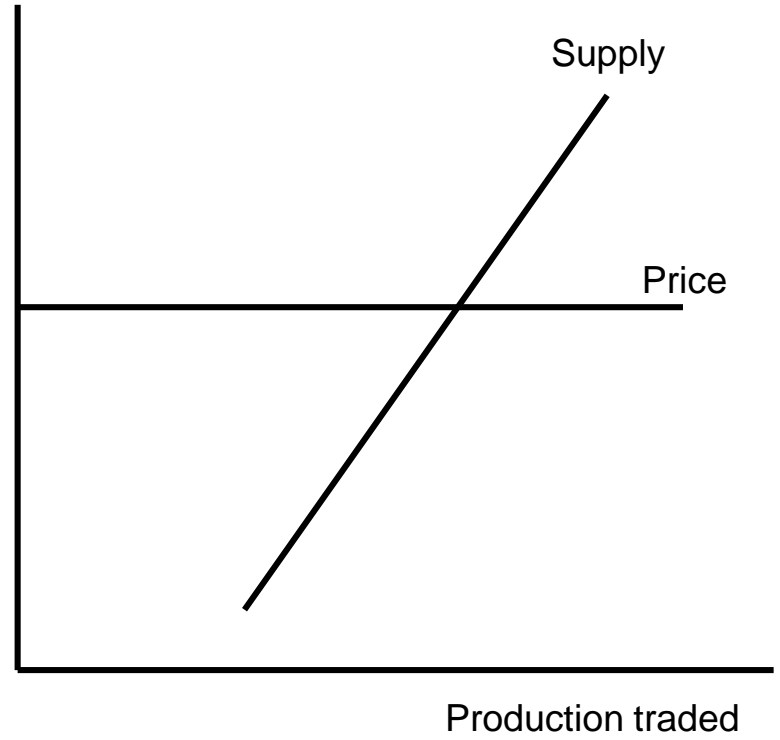
- Consider an economy with a traded and a non-traded sector
- For now let wages be nominally given (short run)
- The non-traded demand is decreasing in price, while the supply is increasing in price
- The traded sector is a price taker, while the domestic supply is increasing in the price

# The model

Price non-traded



Price traded



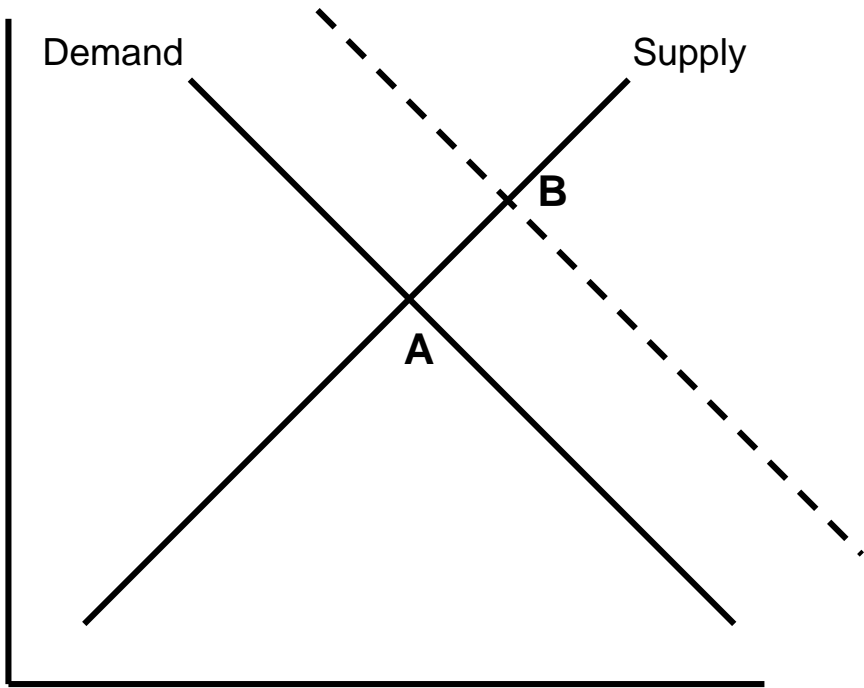
# The model

- Fiscal and monetary policy in the model
- Expansionary fiscal policy
- Expansionary monetary policy
- Supply side fiscal policy



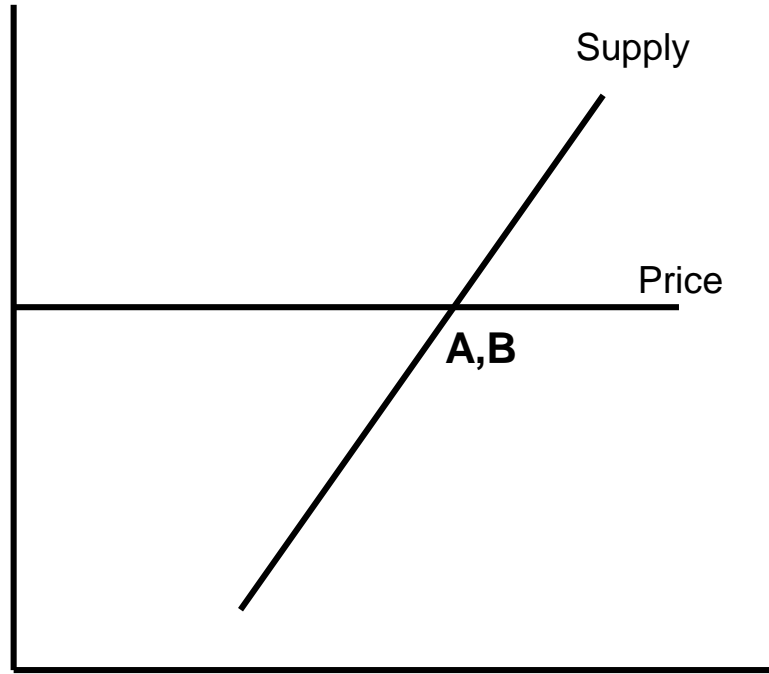
# Fiscal policy

Price non-traded



Production non-traded

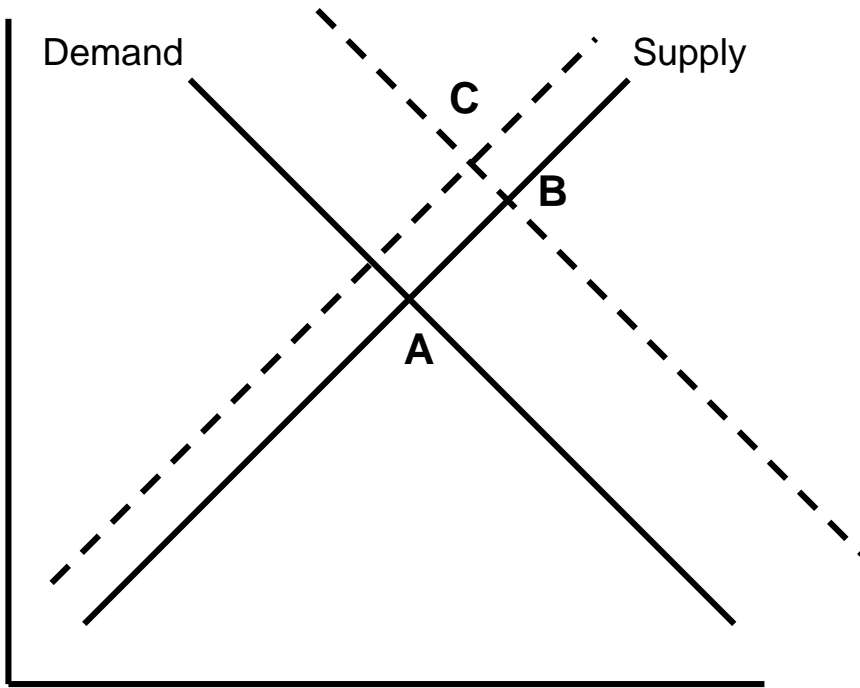
Price traded



Production traded

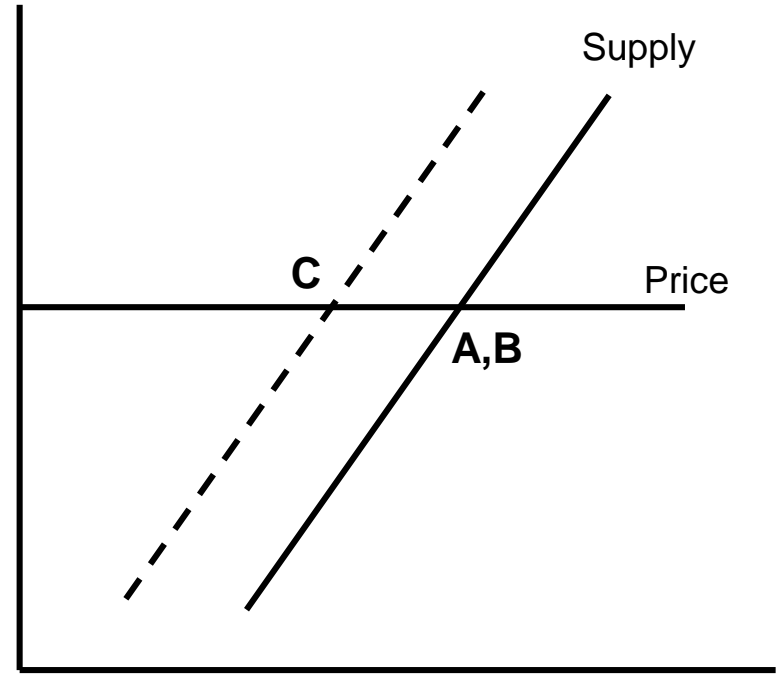
# Fiscal policy + wage response

Price non-traded



Production non-traded

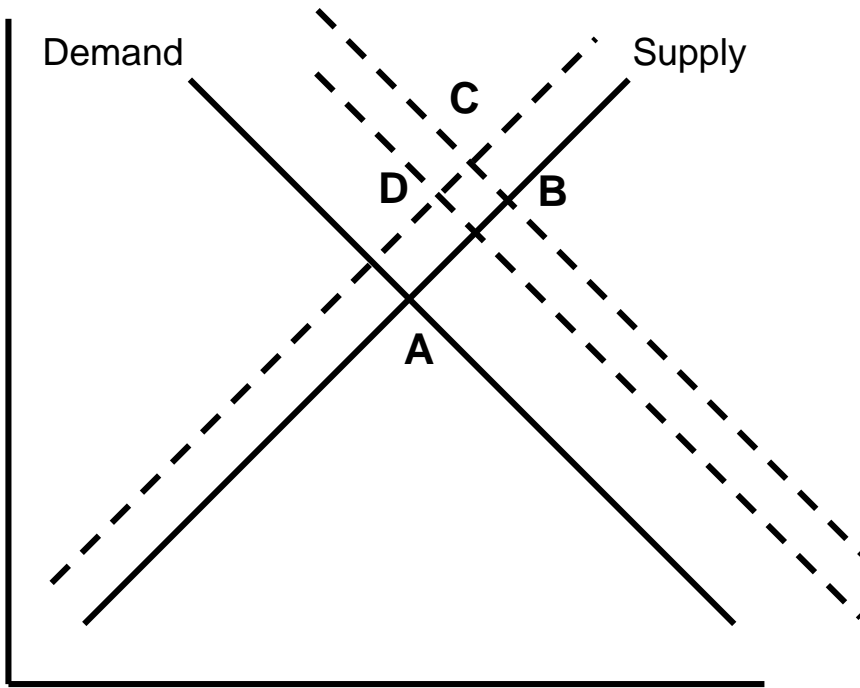
Price traded



Production traded

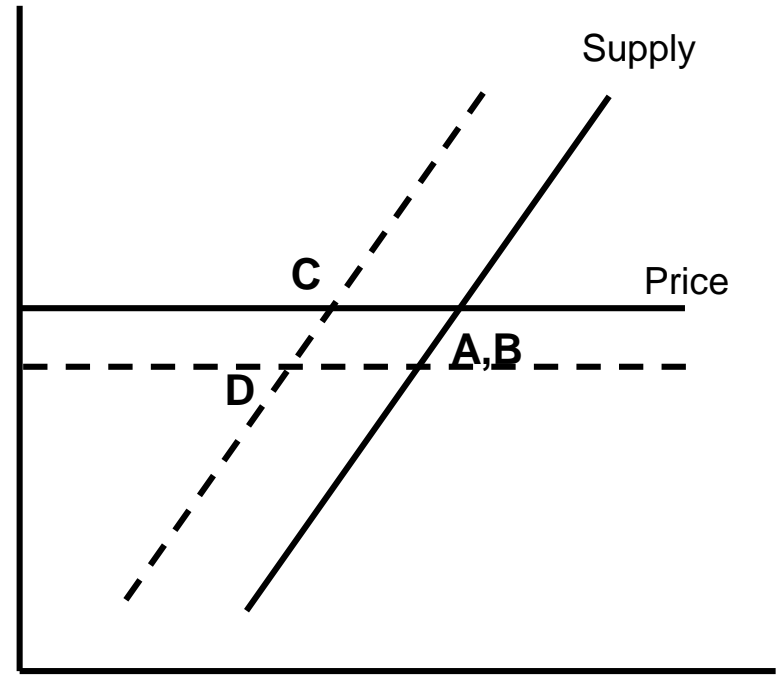
# Fiscal policy + flexible inflation targeting

Price non-traded



Production non-traded

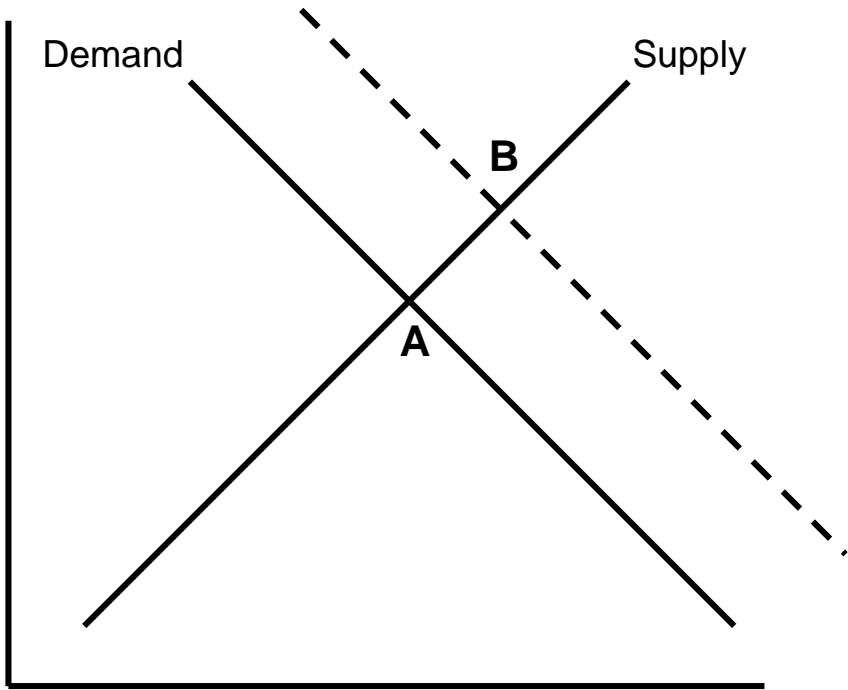
Price traded



Production traded

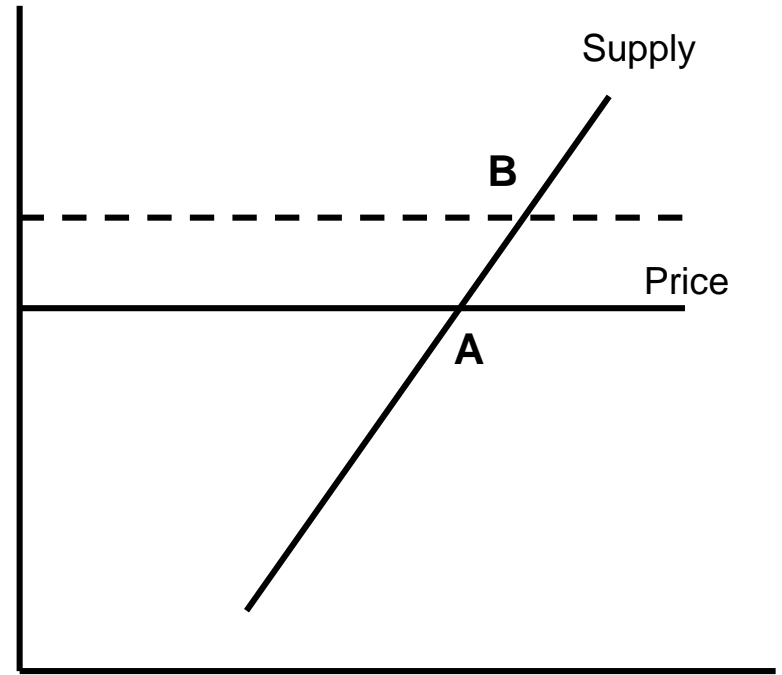
# Expansionary monetary policy

Price non-traded



Production non-traded

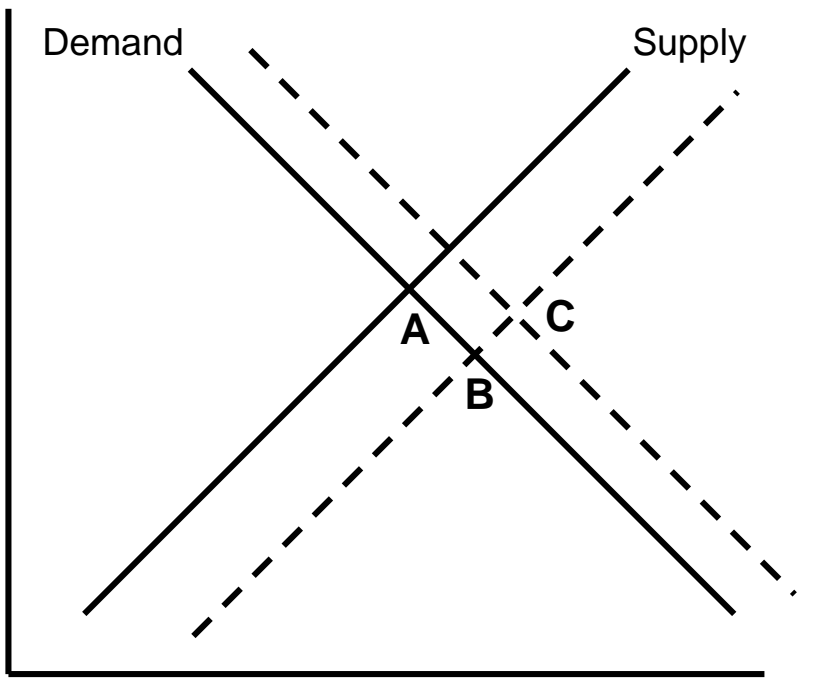
Price traded



Production traded

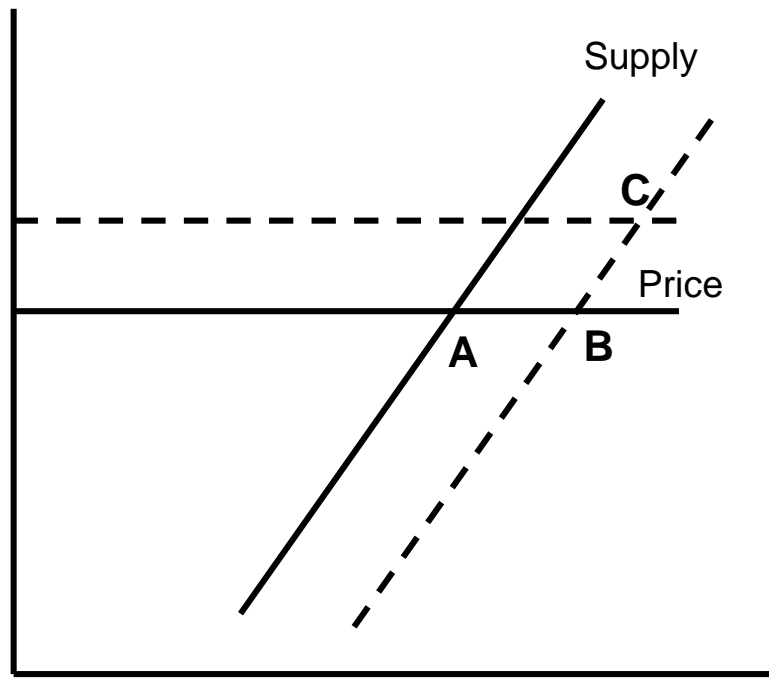
# Supply side fiscal policy

Price non-traded



Production non-traded

Price traded



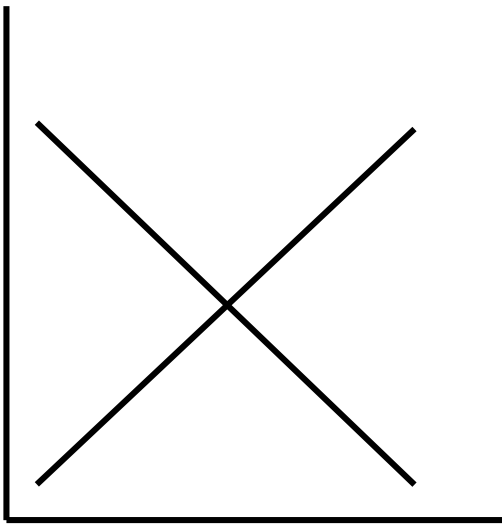
Production traded

# The extended model

- Let us extend the approach by including not only the spending effect, but also the resource movement effect
- Merge the above model with Corden and Neary (1982)

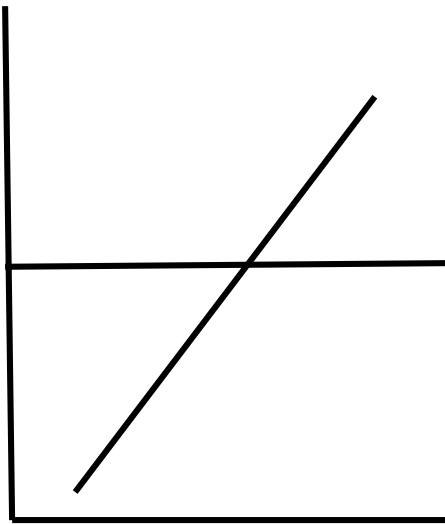
# The extended model

Price non-traded



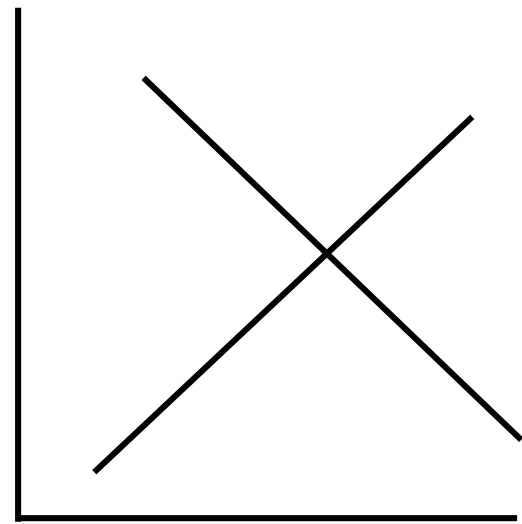
Production non-traded

Price traded



Production traded

Price oil supply industry



Production oil supply industry

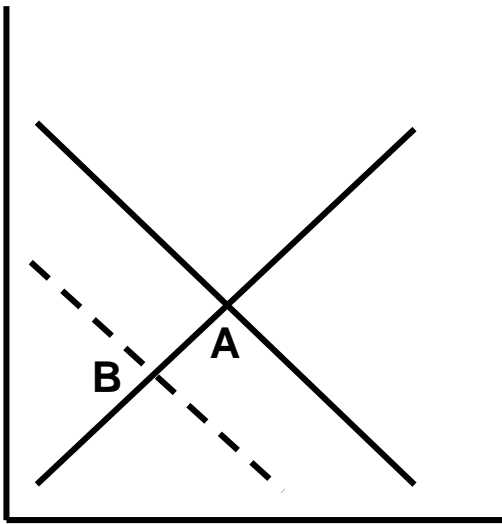
# The extended model

- Now consider a lower oil price or lower investments in the oil sector
- The demand in the oil industry falls. The resource movement effect implies lower incomes in that sector. This adds to the income effect and implies lower demand in the rest of the economy
- So we move from A to B



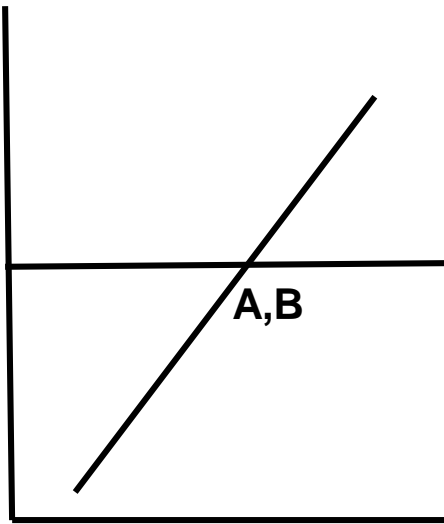
# Lower price of oil

Price non-traded



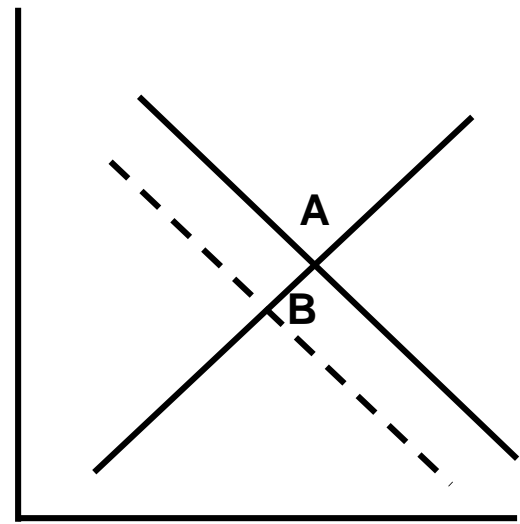
Production non-traded

Price traded



Production traded

Price oil supply industry



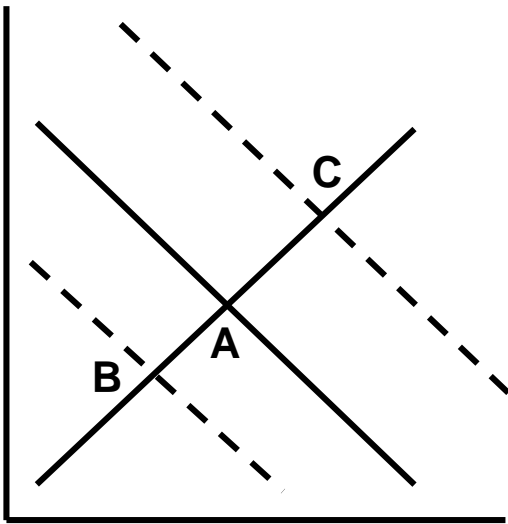
Production oil supply industry

# The extended model

- Now consider trying to fix this with expansionary fiscal policy
- This moves the economy from B to C:

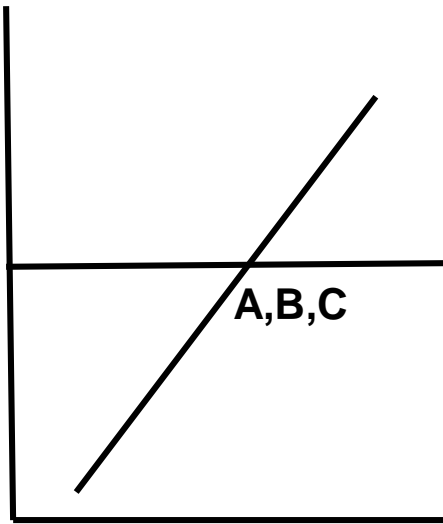
# Expansionary fiscal policy

Price non-traded



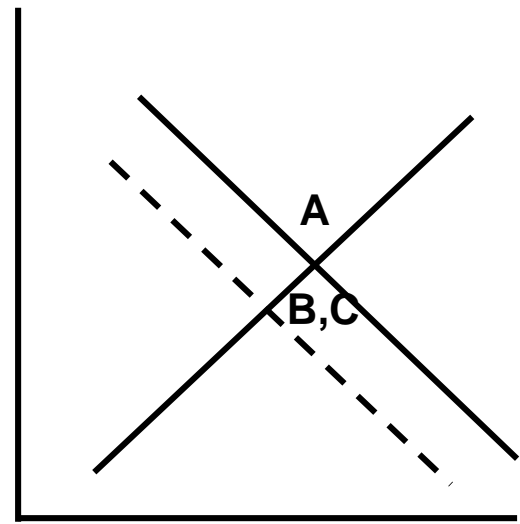
Production non-traded

Price traded



Production traded

Price oil supply industry



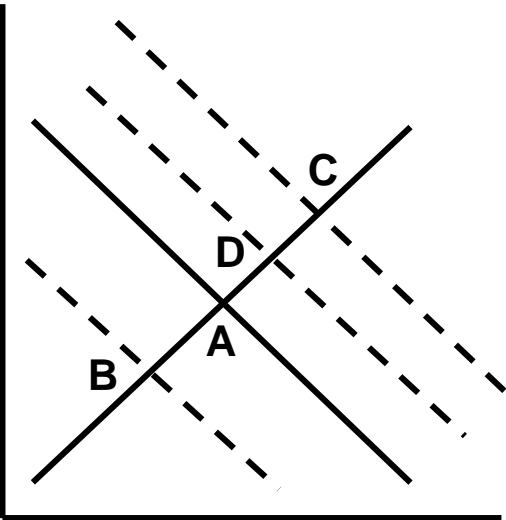
Production oil supply industry

# The extended model

- Now consider a flexible inflation targeting
- This moves the economy from C to D:

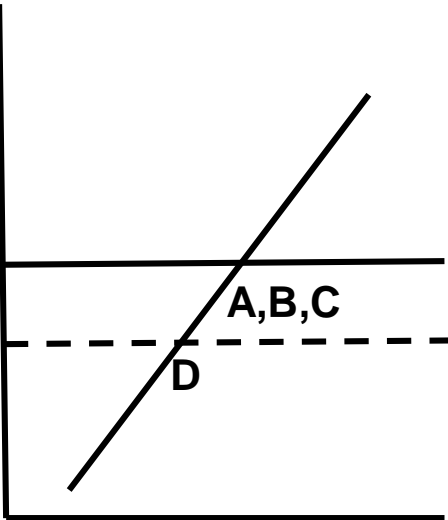
# Expansionary fiscal policy + inflation targeting

Price non-traded



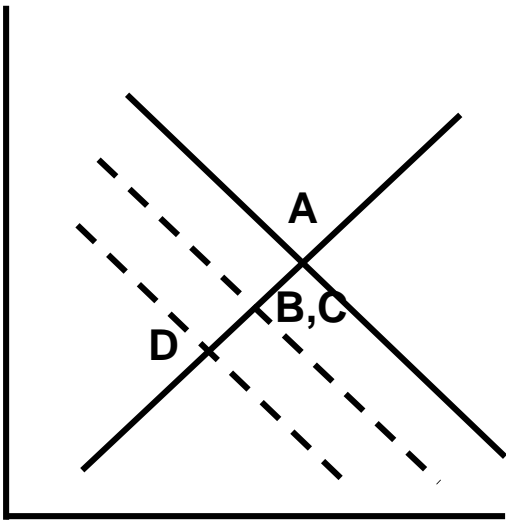
Production non-traded

Price traded



Production traded

Price oil supply industry



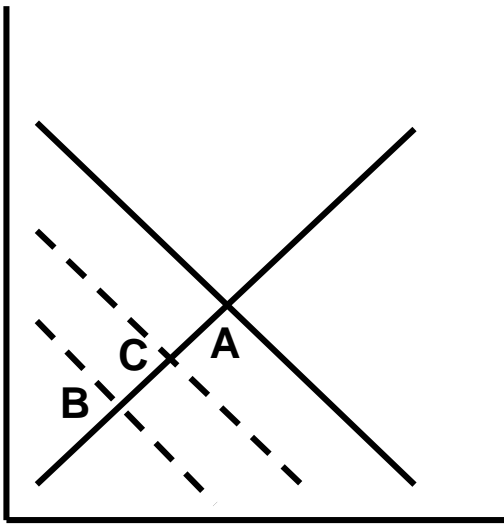
Production oil supply industry

# The extended model

- Now consider instead that monetary policy through a flexible inflation target is the policy response to lower oil prices

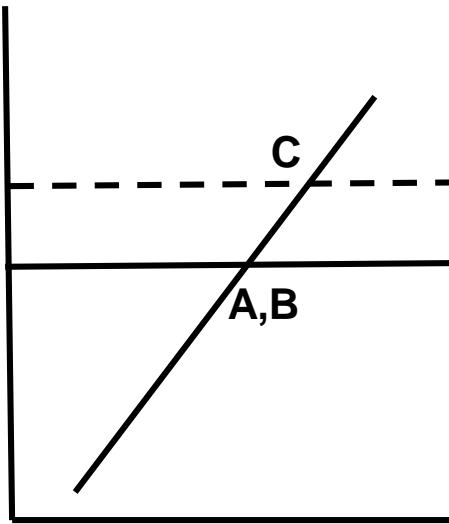
# Lower oil price + inflation targeting

Price non-traded



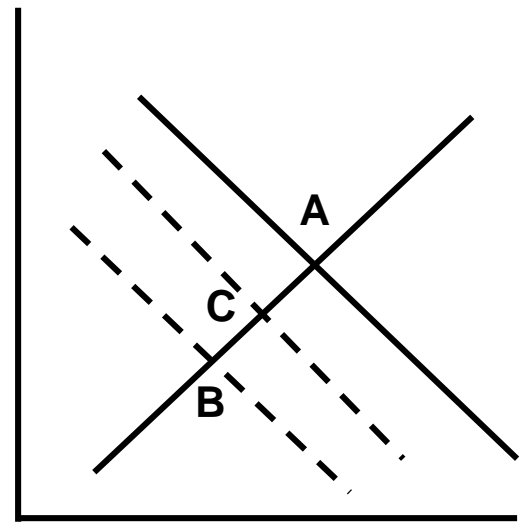
Production non-traded

Price traded



Production traded

Price oil supply industry



Production oil supply industry

# The extended model

## Medium run dynamics

- Now consider investment functions in the sectors that may depend on the real exchange rate, activity, and/or the interest rate
- Fiscal policy expansion:
  - Three channels push traded sector investments down
- Monetary policy expansion:
  - Three channels push traded sector investments up



# Conclusions

- So the point is that even if monetary policy may be neutral in the long run, it should respond to a permanent shock which alters the long run equilibrium of the economy
- When you walk to a new place it matters a lot which path you choose to go there
- How does this square with the macro models most used today?  
....pretty bad

# Conclusions

- A permanent fall in oil prices implies a long run structural transformation
- Monetary policy being the first line of defense in the macroeconomic policy framework helps this transformation
- If fiscal policy is used it should be directed at the supply side