Oil and the Euro Area Economy

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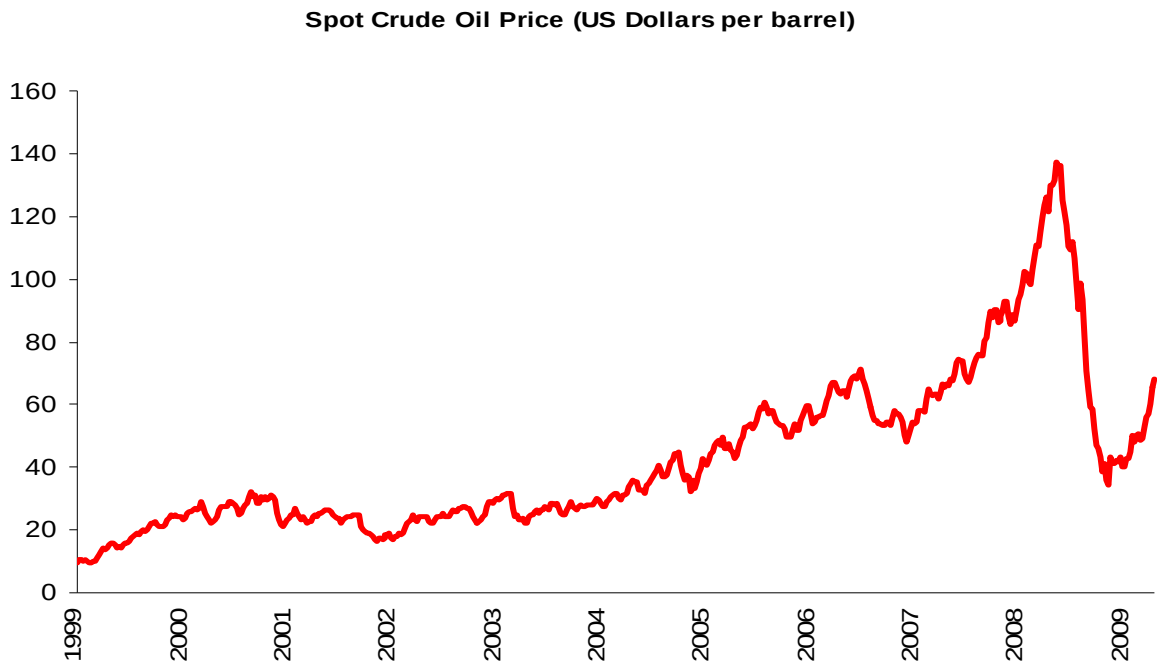
EEA-ESEM Barcelona, 24 August 2009

Motivation

- Substantial **crude oil price fluctuations** in recent times
  - From $16 a barrel in 1999 to $147 by the middle of 2008, back to $35 in 2009



- Little is known about **macroeconomic consequences** and exact oil transmission mechanism, especially for **Euro area** and its member countries

This paper

- **Macroeconomic effects** of **different types of oil shocks** in the Euro area (**EA**) and United States (**US**)
  - Not all oil shocks are alike: measuring the impact depending on the underlying source of the oil price shift
  - Consequences and appropriate policy reaction is very likely to be different for e.g. oil price shifts due to supply disruptions or changes in oil demand driven by economic activity
- A closer look at the **pass-through** to **inflation**
  - Decomposition of different channels in EA and US
- Impact in individual **EA-countries**
  - Explain **asymmetries** based on oil transmission channels: important role of differences in labour market characteristics

1.Macroeconomic effects of oil shocks

- Estimation of an **SVAR** model for the Euro area:

$$Y_t = c + A(L)Y_{t-1} + u_t$$

- **Oil market** variables
  - Global oil production
  - World crude oil price
  - World economic activity
- **Euro area** variables
  - Real GDP
  - HICP
  - Nominal interest rate
  - Euro/dollar exchange rate
- Sample period **1986Q1-2008Q1** with 3 lags

1.Macroeconomic effects of oil shocks

- **Not all oil shocks are alike**: we disentangle three types of oil shocks using sign restrictions
  - **Oil supply shocks** (e.g. production disruptions in oil-exporting countries)

	Q_{oil}	P_{oil}	Y_{wd}	Y_{EA}	P_{EA}	i_{EA}	€/$
Oil supply shock	**<0**	**>0**	**≤0**				

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  - **Oil demand shocks driven by economic activity**

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  - **No restrictions imposed on Euro area variables**

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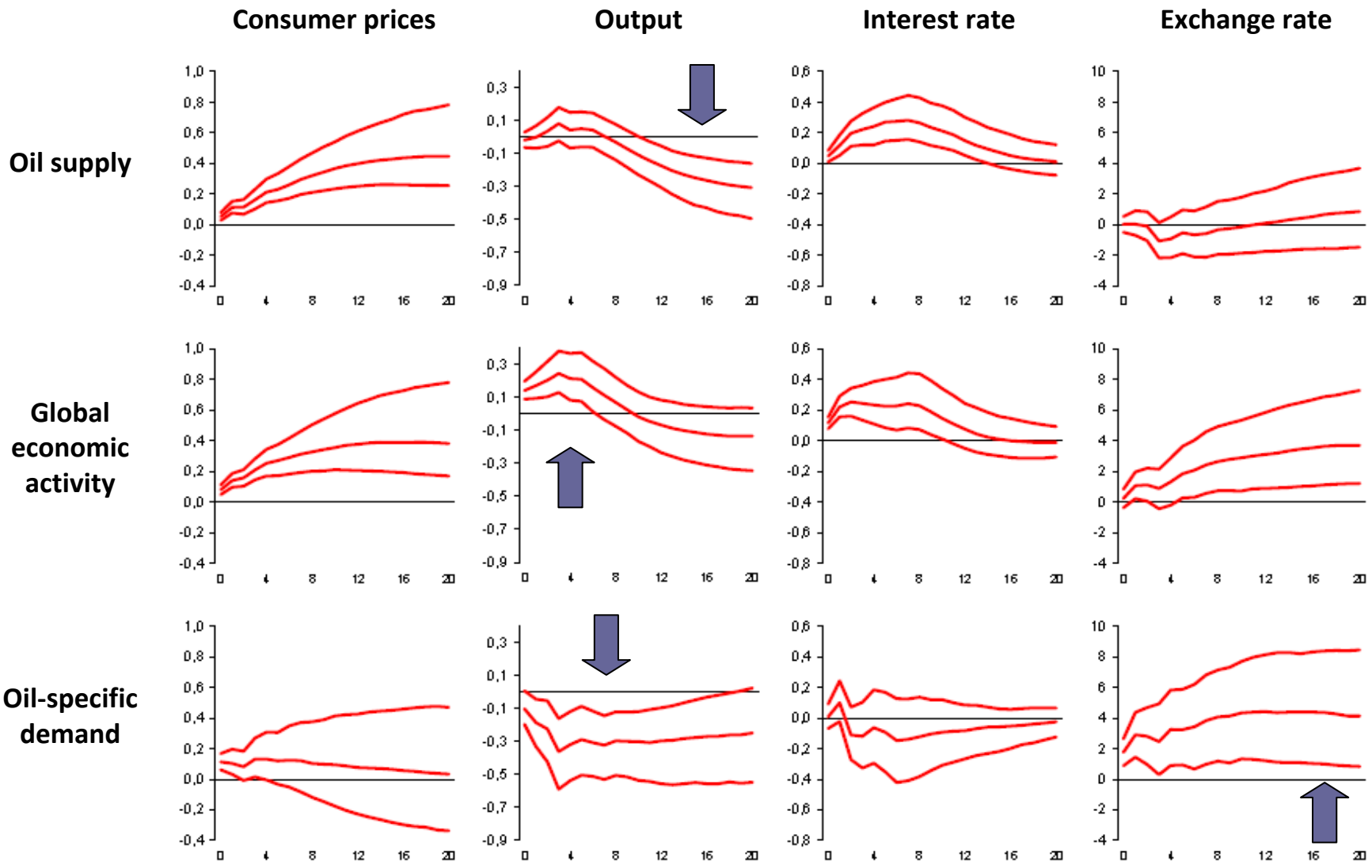
1.Macroeconomic effects of oil shocks

- **Impact of a 10% oil price shock in the Euro area**



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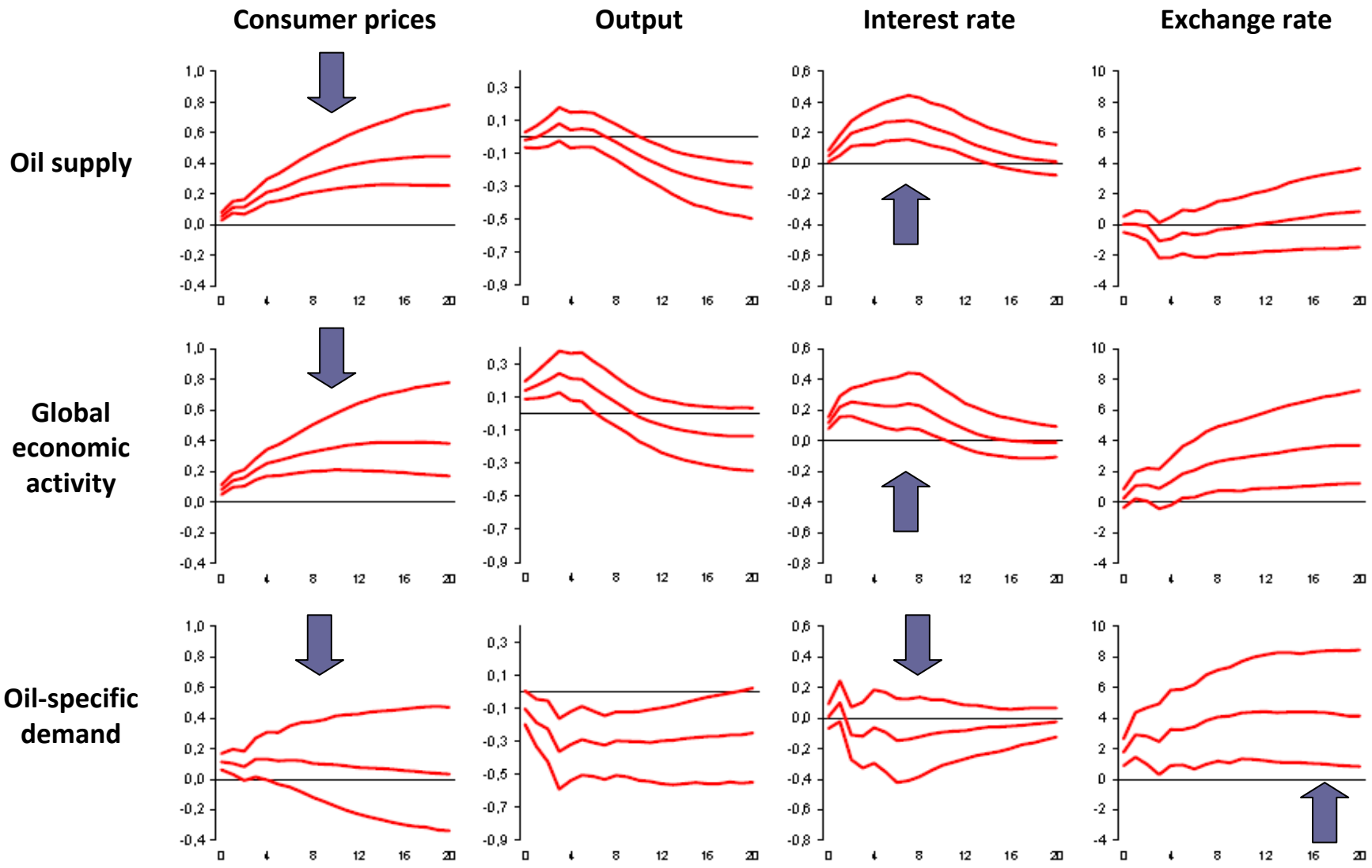
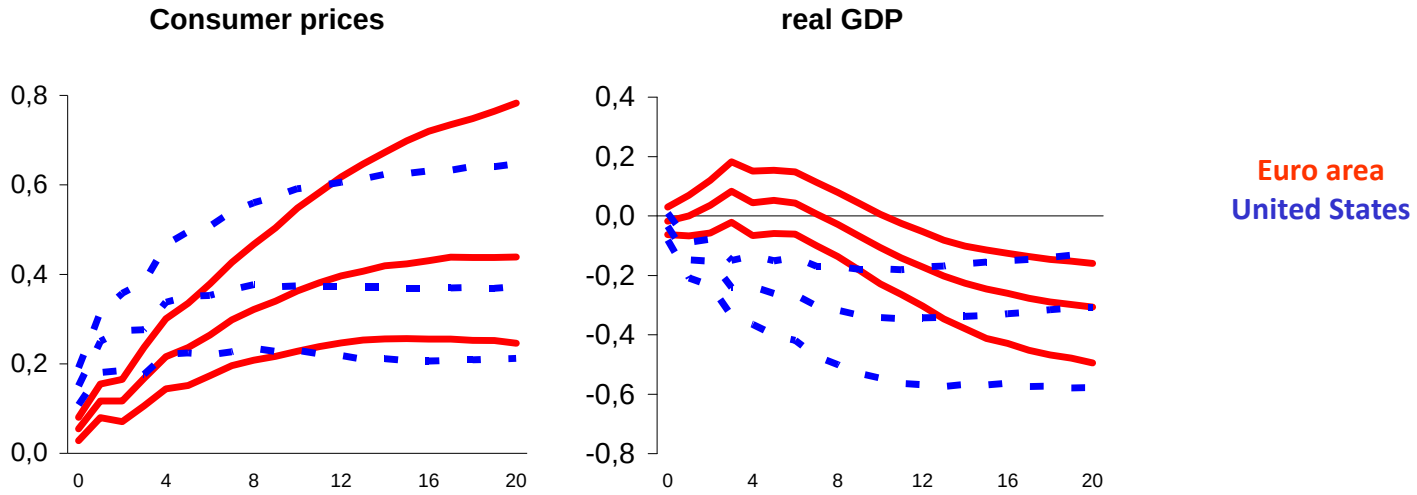


1.Macroeconomic effects of oil shocks

- **A comparison with the United States**
  - Similar differences between three types of shocks
    - We notice a **monetary policy** reaction more in line with output stabilisation in US, and with inflation stabilisation in EA
  - Striking difference of **pass-through** of oil supply shocks to consumer prices and economic activity



  - Estimate the impact of oil supply shocks on additional variables to measure different **channels of pass-through**

2.Pass-through to inflation

- **An extended SVAR model for the EA and the US**

$$\begin{bmatrix} Y_t \\ Z_t \end{bmatrix} = c + \begin{bmatrix} A(L) & B(L) \\ C(L) & D(L) \end{bmatrix} \begin{bmatrix} Y_{t-1} \\ Z_{t-1} \end{bmatrix} + \begin{bmatrix} u_t \\ v_t \end{bmatrix}$$

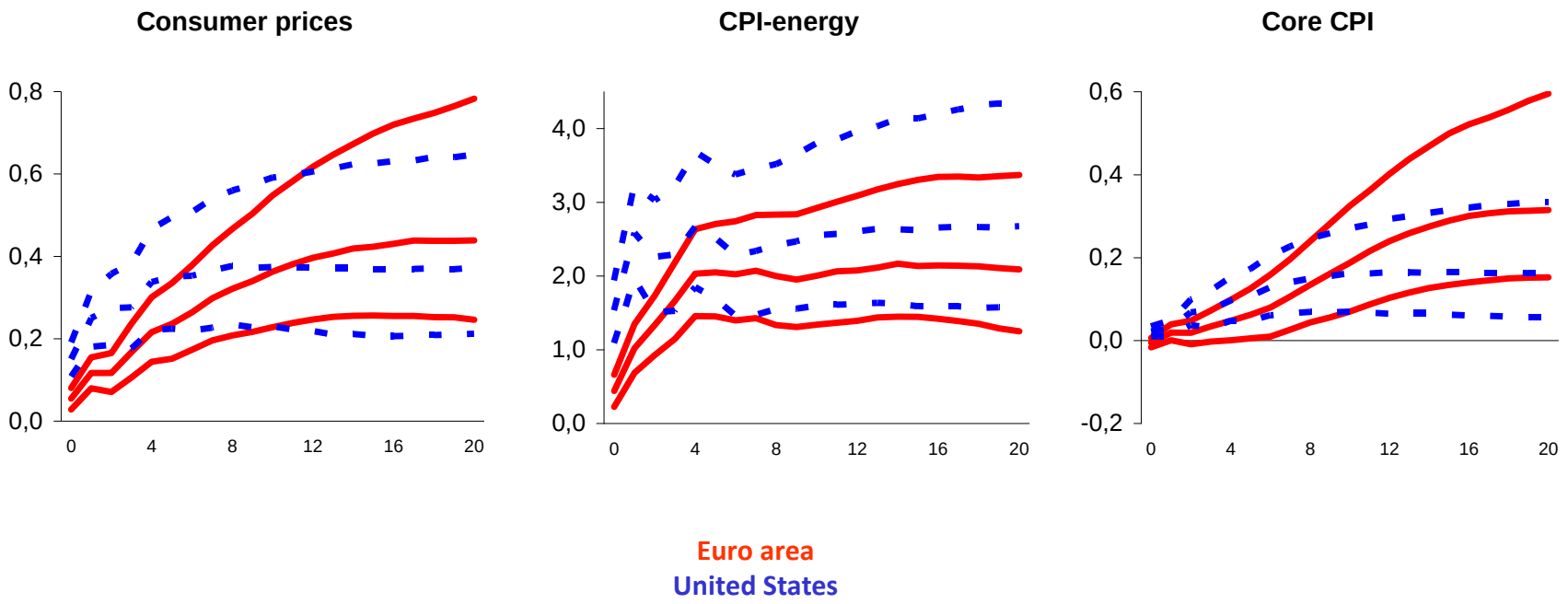
  - Y_t: benchmark variables
  - Z_t: additional variable of interest to capture a specific channel or effect
  - Results are robust when B(L)=0

- **Focus on 10 % oil supply shock**

Variance decomposition	Oil price volatility	Euro area inflation
Oil supply shock	**51%**	**22%**
Global economic activity shock	36%	14%
Oil-specific demand shock	13%	2%

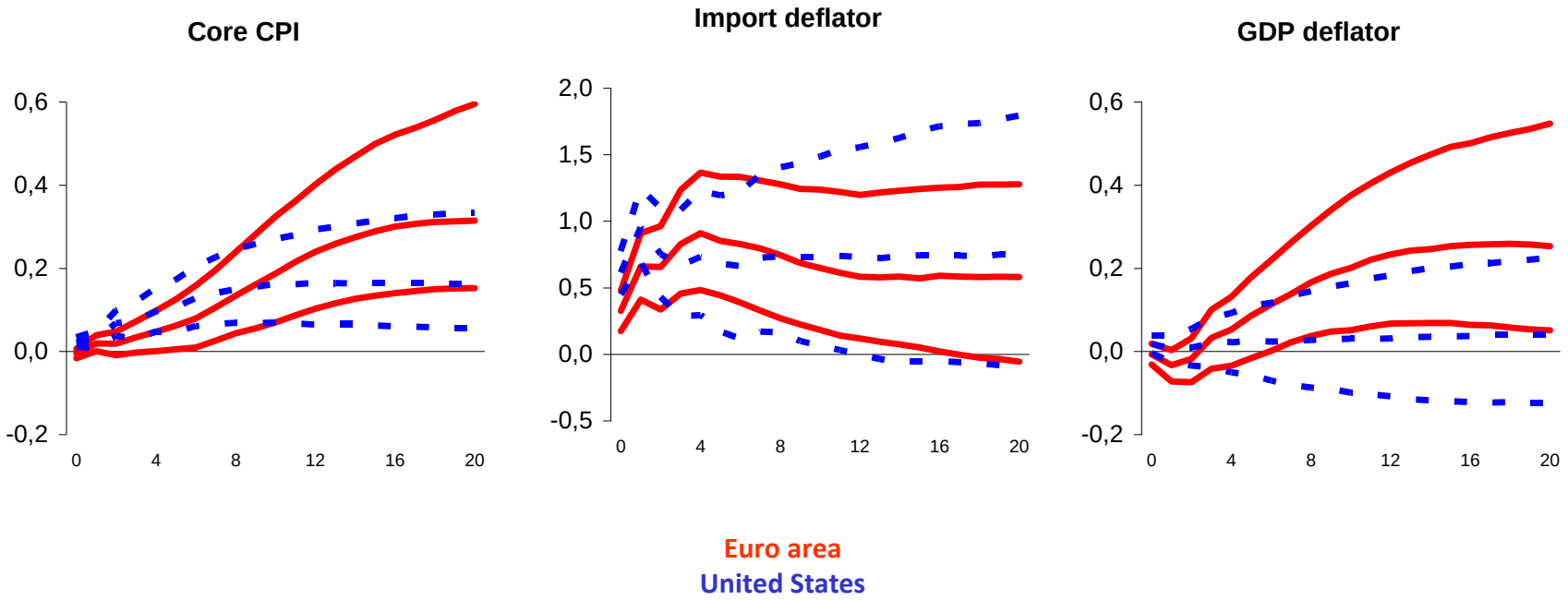
2.Pass-through to inflation

- **Direct effects**
  - Oil supply shock has a direct effect on consumer prices because oil (energy) is part of the index
  - If only direct effects are relevant, core CPI should not react



2.Pass-through to inflation

- **Cost effects**
  - Production costs of firms increase, which are passed on to prices of non-energy goods and services
  - For oil-importing countries: should only affect the import deflator and not the GDP deflator (domestic value added)



2.Pass-through to inflation

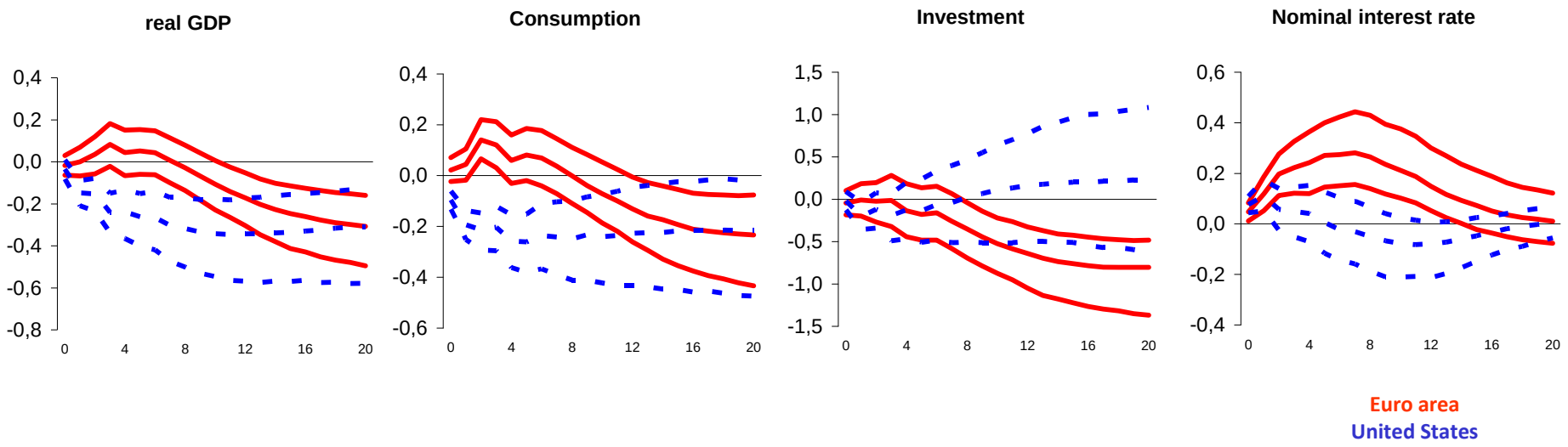
- **Second-round versus demand effects**
  - GDP deflator positively affected by second-round effects
    - Employees demand higher wages, which are passed on to prices
  - GDP deflator negatively influenced by a fall in aggregate demand (see later)

  - **US:** loss in purchasing power entirely borne by employees
  - **EA:** long-run purchasing power of employees constant, loss transferred to producers and higher prices
    - Is in line with tax literature (e.g. Daveri and Tabellini 1997)

2.Pass-through to inflation

- **Demand effects and impact on economic activity**
  - Income effects: less disposable income for other goods and services
  - Precautionary savings: less consumption due to uncertainty
  - Uncertainty effects: postponement of irreversible purchases of investment and consumption goods complementary to energy

  - **Monetary policy effects**: central bank reaction to shock



3.Impact in individual EA-countries

- **An extended SVAR model for individual member countries**

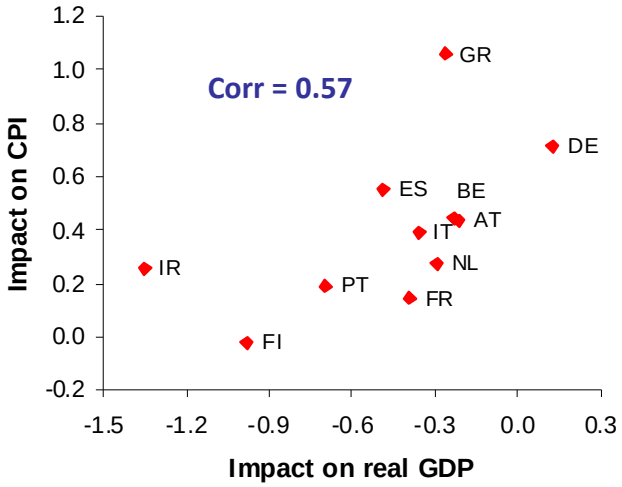
$$\begin{bmatrix} Y_t \\ Z_t \end{bmatrix} = c + \begin{bmatrix} A(L) & B(L) \\ C(L) & D(L) \end{bmatrix} \begin{bmatrix} Y_{t-1} \\ Z_{t-1} \end{bmatrix} + \begin{bmatrix} u_t \\ v_t \end{bmatrix}$$

  - Y_t: benchmark Euro area variables
  - Z_t: country specific real GDP, CPI (and additional variable)
    - Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain

- **Focus on 10 % oil supply shock**

3.Impact in individual EA-countries

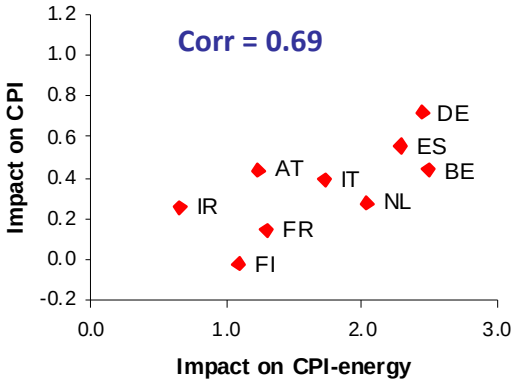
- **Long-run impact of a 10% oil supply shock**
  - Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain



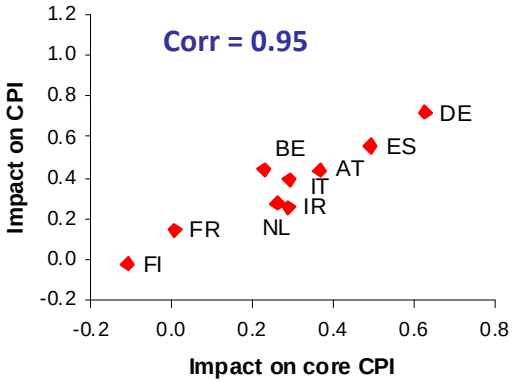
  - Considerable **differences** across member countries
    - Cannot be explained by oil intensity of countries
  - **Positive correlation** (0.57) between impact on CPI and real GDP: at odds with conventional idea of a supply shock!
    - More limited output losses for countries with stronger price increase

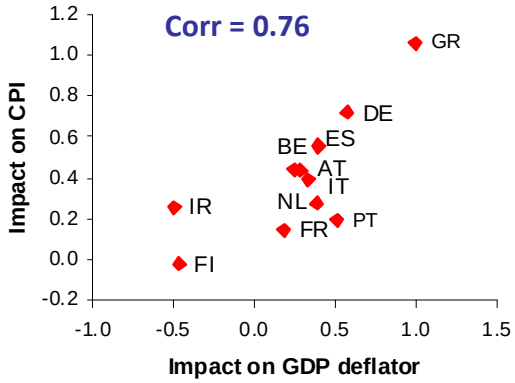
3.Impact in individual EA-countries

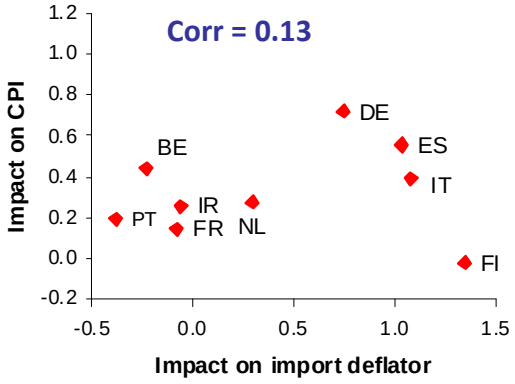
- **Direct versus indirect effects on inflation**
  - Reaction of **CPI-energy** is relevant to explain differences



  - **Indirect effects** are most important
    - In particular second-round and demand effects (not cost effects)

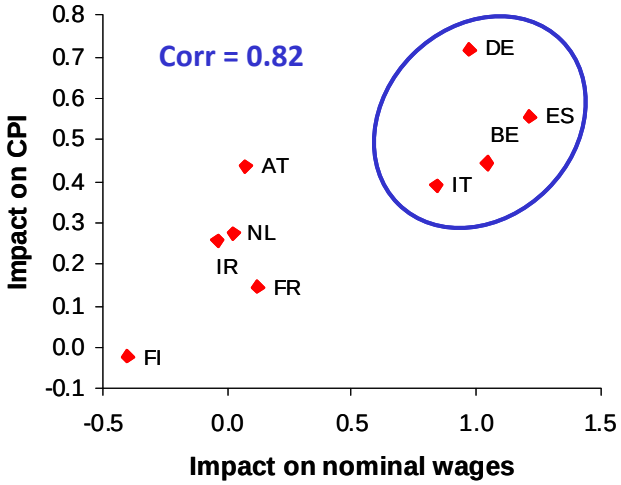






3.Impact in individual EA-countries

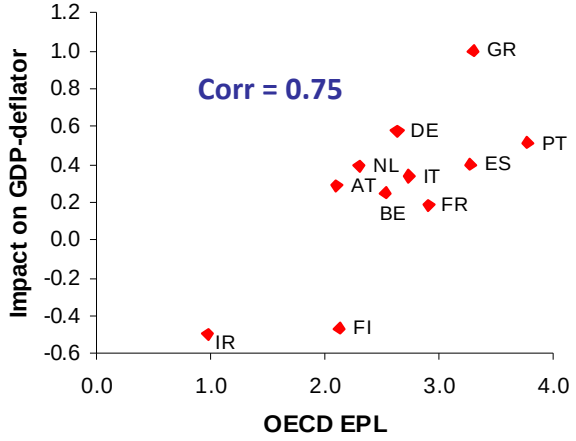
- **Second-round effects as a source of asymmetries**
  - **Wage reaction** considerably different across countries
    - Strong reaction in Spain, Belgium, Italy and Germany
    - No significant reaction in Austria, Finland, France, Ireland and the Netherlands
  - Different wage reactions explain cross country **differences of impact on CPI** (and GDP deflator)

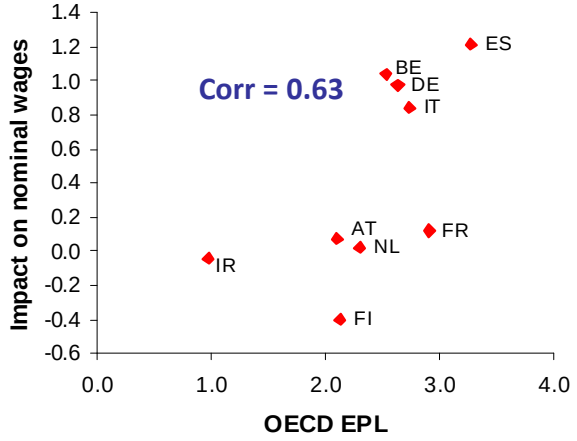


  - Paper provides additional sectoral evidence of wages being source of asymmetric price responses

3.Impact in individual EA-countries

- **Second-round effects as a source of asymmetries:**
  - Wage reaction can be related to **labour market characteristics**
    - **Automatic wage indexation** mechanism or wage guidelines
      - ECB (2008): strong in Spain, Belgium and Italy
    - **De facto indexation and real wage rigidity**
      - Degree of centralisation of wage bargaining (Calmfors and Driffill 1988)
      - Tightness of labour market (output reaction) will matter (e.g. Germany)
      - OECD indicator of the strictness of employment protection legislation





3.Impact in individual EA-countries

- **Single monetary policy stance and further divergence**
  - Cross-country differences of impact on output are dominated by **demand effects**, in particular **monetary policy effects**
  - "**One monetary policy stance which does not fit all**" must be a crucial explanation
    - Countries with weak second-round effects have high real interest rate
    - Low real interest rate for countries with strong second-round effects
    - Output and inflation further depressed in former group which in turn lead to higher real interest rates aggravating the differences
    - Confirmed by behaviour of consumption, ***investment*** and their respective deflators
  - **Explains** why we find a **positive correlation** between ultimate impact on output and prices across countries
    - Positive correlation disappears (and becomes negative) in the absence of a monetary policy reaction

Conclusions

- **Not all oil shocks are alike:** impact (especially on economic activity) depends on the **source of oil price shift**

- **Pass-through to inflation very different from US**
  - **US**: strong direct impact of rising energy prices and indirect effects of higher production costs
  - **EA**: **second-round effects** are very important

- **Considerable asymmetries across member countries**
  - Different **labour market** dynamics (second-round effects) are an important source of asymmetric price reactions
  - Divergence is further aggravated by one **common monetary policy** stance which does not fit all