The Economic Consequences of Oil Shocks

Differences Across Countries and Time

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Inflation Challenges in an Era of Relative Price Shocks

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Analysis in this paper

- **Economic consequences of oil shocks across a set of very diverse industrialised countries**
  - Oil and energy-importing: **US**, **Euro area**, **Japan** and **Switzerland**
  - Oil and other forms of energy-exporters: **Norway** and **Canada**
  - Oil-exporter but importer of other forms of energy: **UK**
  - Oil-importer but exporter of other forms of energy: **Australia**
- **Three different perspectives**
  1. Cross-country effects of **different types** of oil shocks
  2. A closer look at the **oil transmission mechanism**
  3. Has the impact **changed over time**? (see paper)

1. Macroeconomic effects of oil shocks

- Estimation of a **benchmark SVAR** model

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

Oil market variables

- Global oil production
- World crude oil price
- World economic activity

Country-specific variables

- Real GDP
- Consumer prices
- Nominal interest rate
- Nominal effective 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)

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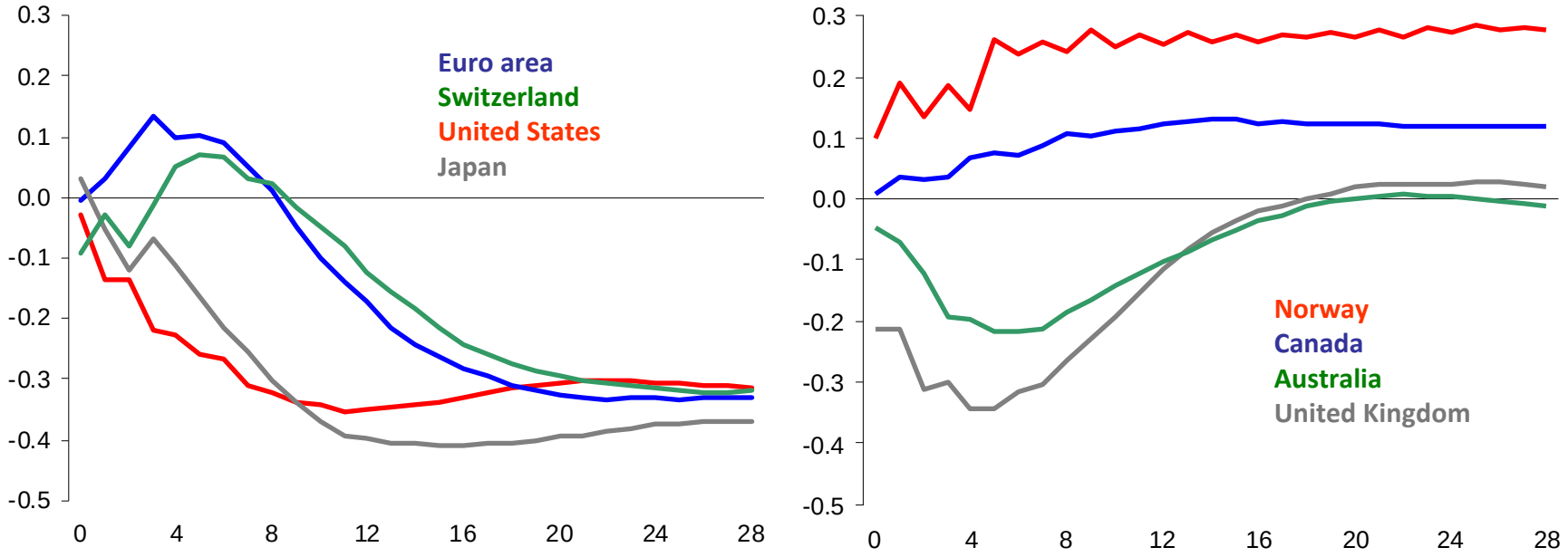
1. Macroeconomic effects of oil shocks

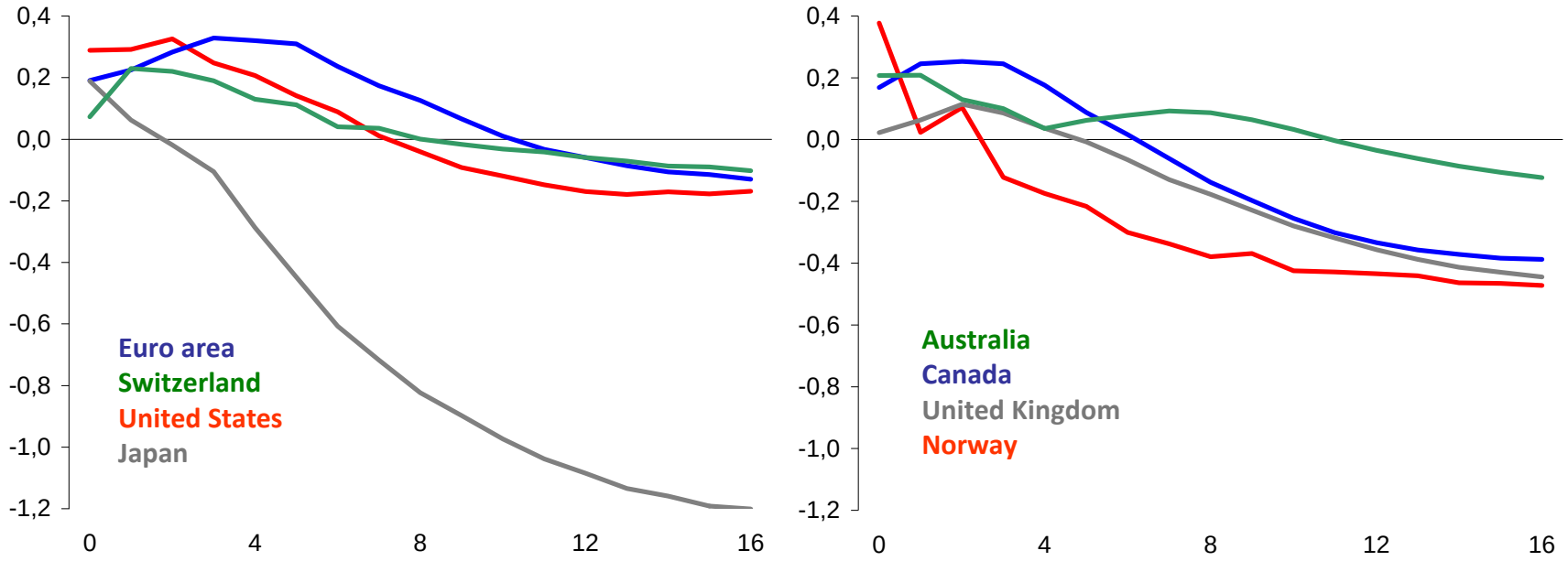
- Impact of 10% **oil supply shock** on output



  - **Permanent and significant fall** in oil and energy-importing countries
    - Very sluggish reaction in Euro area and Switzerland compared to a quick fall in US and Japan
  - **Permanent increase** in countries that export both oil **and** other forms of energy: Norway and Canada
  - Only a **temporary decline** in countries exporting oil **or** other forms of energy: Australia and UK

1. Macroeconomic effects of oil shocks

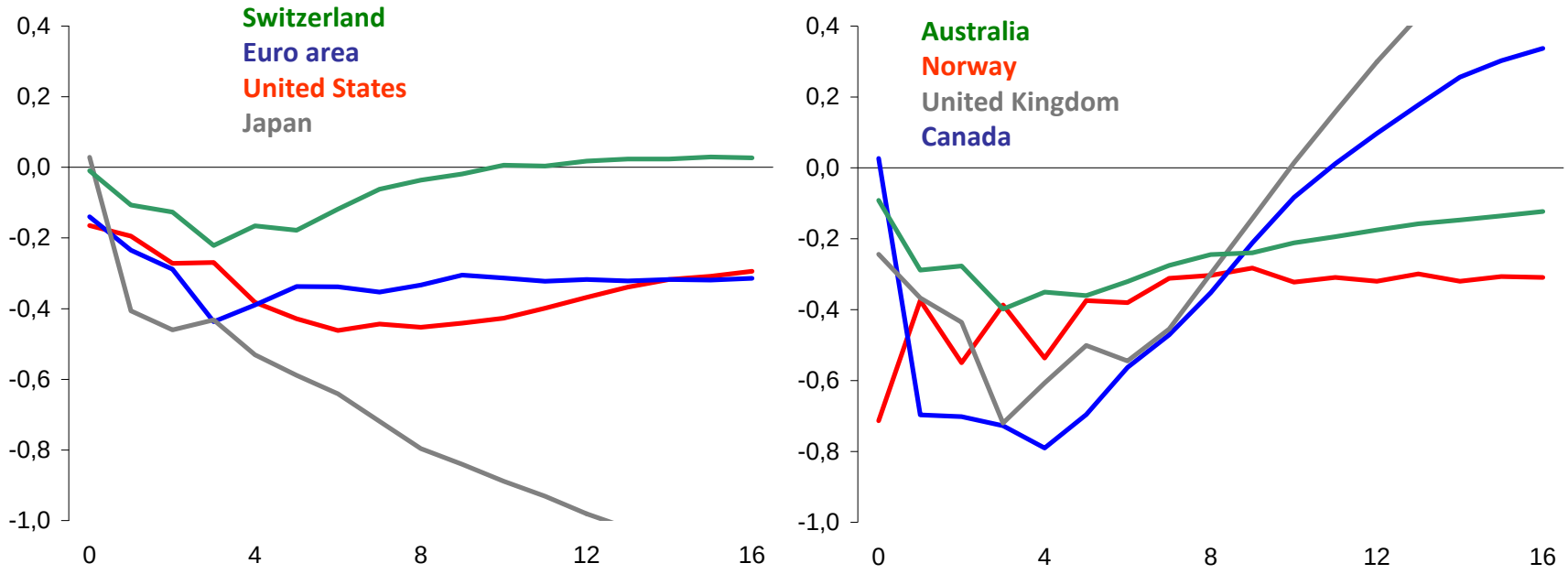
- Impact of 10% **global activity shock** on output



  - Significant **transitory increase** of real GDP in all countries
    - Role of oil and energy in the economy does not matter for differences
    - Not surprising: even output in oil-importing countries could rise because country itself is in a boom or indirectly gains from trade with the rest of the world (cfr. oil price increase due to worldwide economic activity)

1. Macroeconomic effects of oil shocks

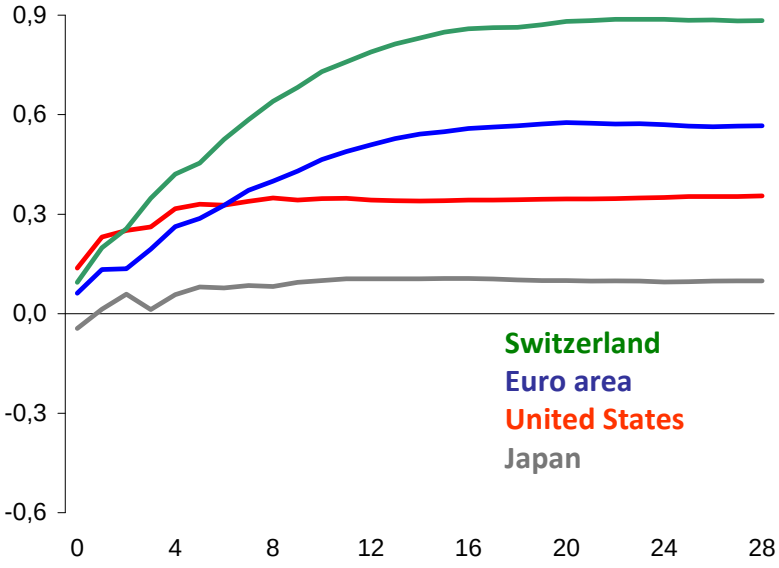
- Impact of 10% **oil-specific demand shock** on output

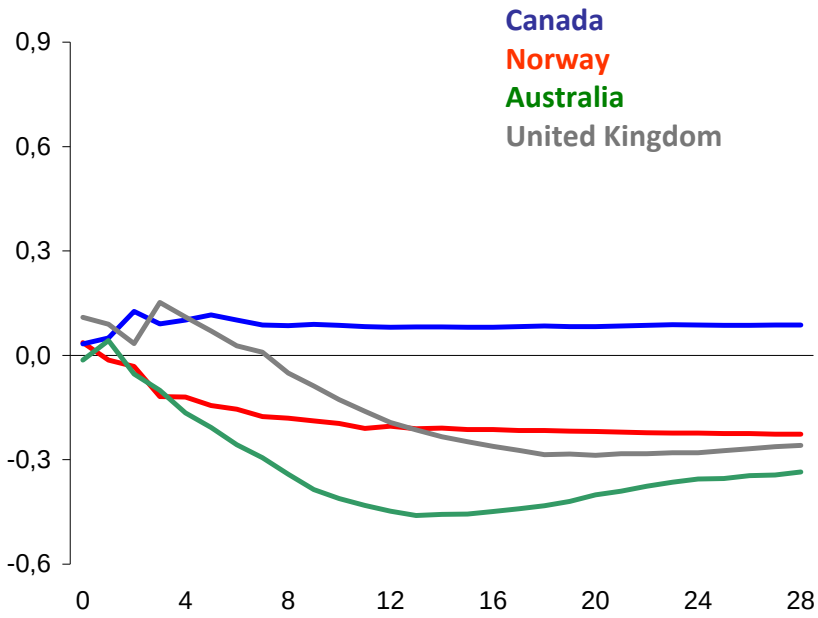


  - Significant **temporary decline** of real GDP in all countries
    - Role of oil and energy in the economy does again not matter for differences

2. Pass-through to inflation

- Extend the benchmark SVARs with additional variables one by one
- Focus on **oil supply shocks** and **oil-importing** countries

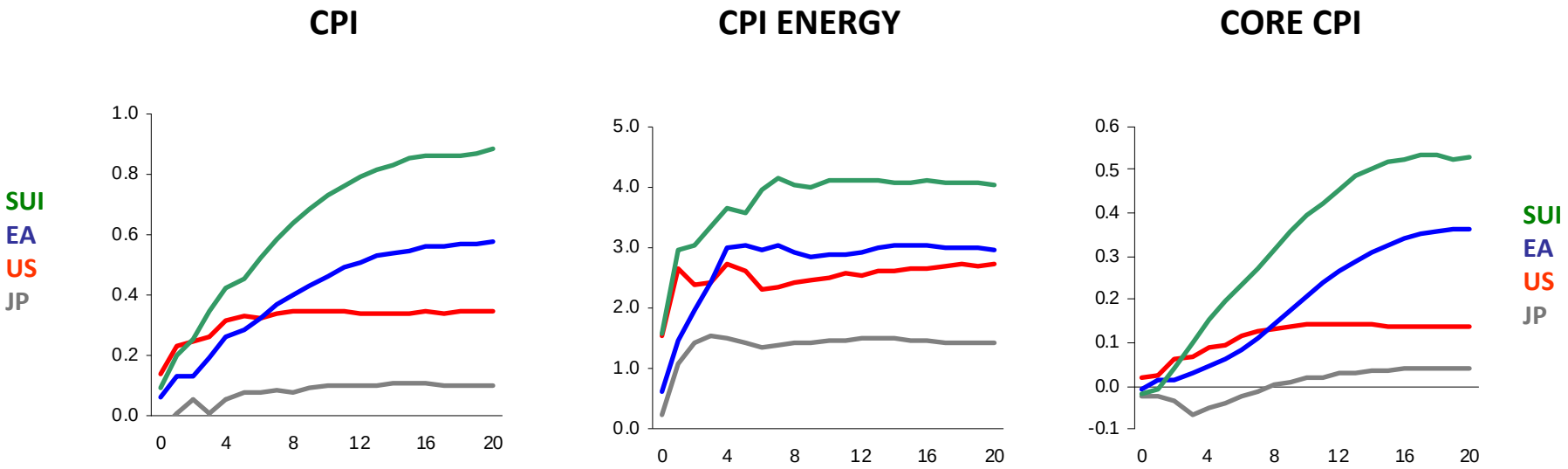




  - **Significant inflationary effects** in oil and energy-importing countries
    - Considerable cross-country differences of magnitude
    - Speed of pass-through: US and Japan versus Euro area and Switzerland
  - **No significant impact** on consumer prices in oil and/or energy-exporting countries (could be explained by an appreciation of effective exchange rate)

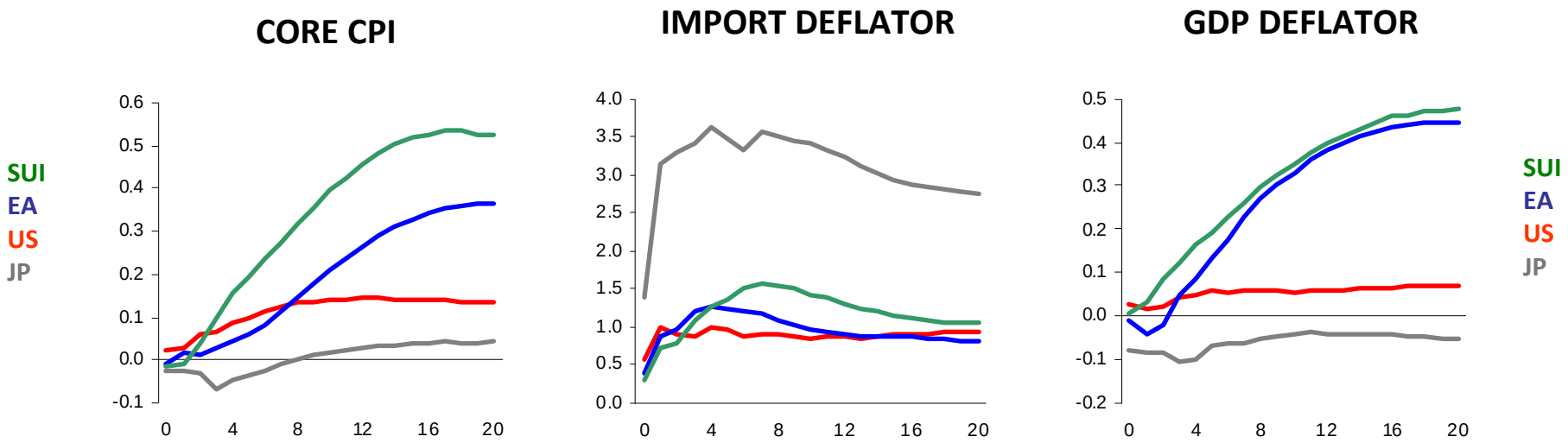
2. Pass-through to inflation

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



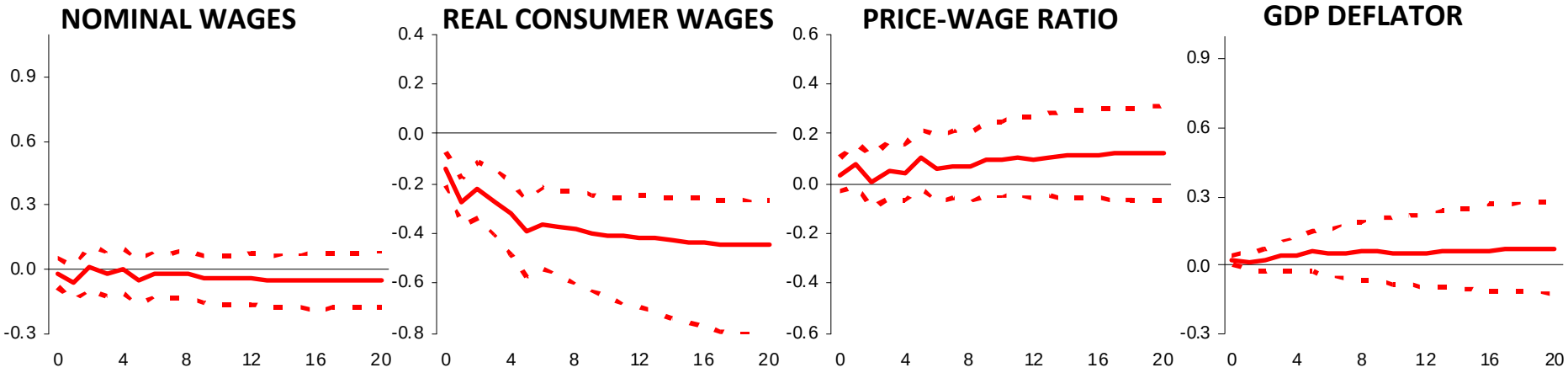
2. Pass-through to inflation

- **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)
    - Significant impact on import deflator in all countries
    - US and Japan: no reaction of GDP deflator
    - Euro area and Switzerland: considerable rise of GDP deflator



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)
  - Consider **nominal wages, real consumer wages and price-wage ratio**
    - **US**: loss in purchasing power entirely borne by employees



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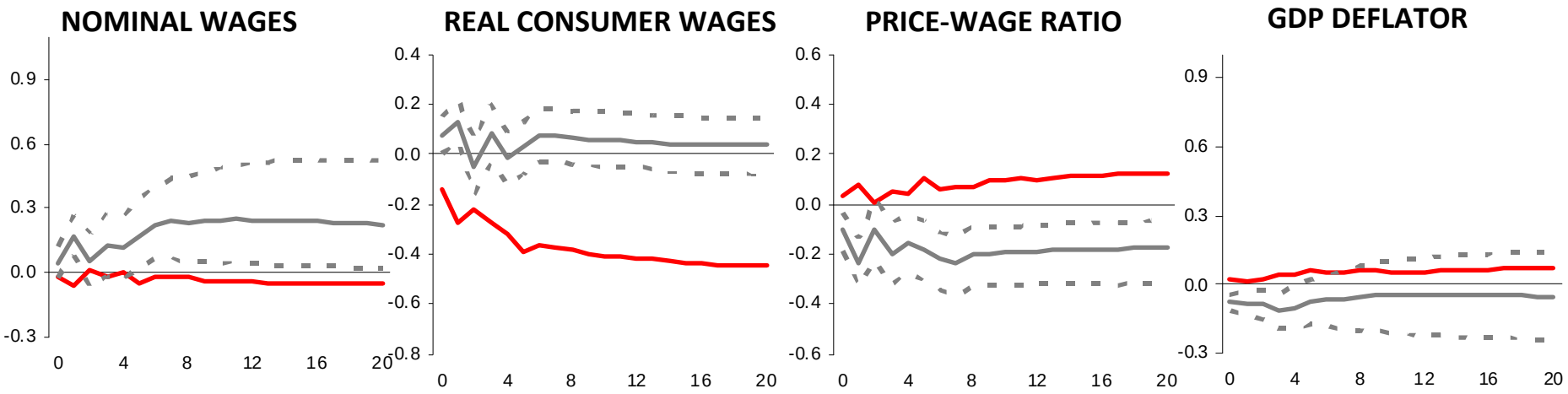

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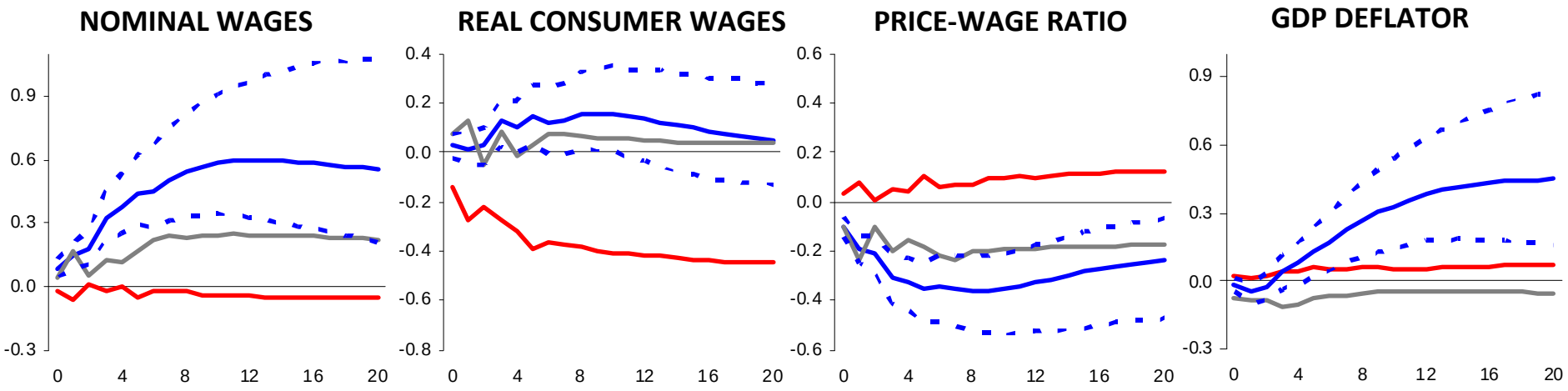
    - **Euro area**: purchasing power of employees constant, loss transferred to producers and higher prices (**second-round effects**)



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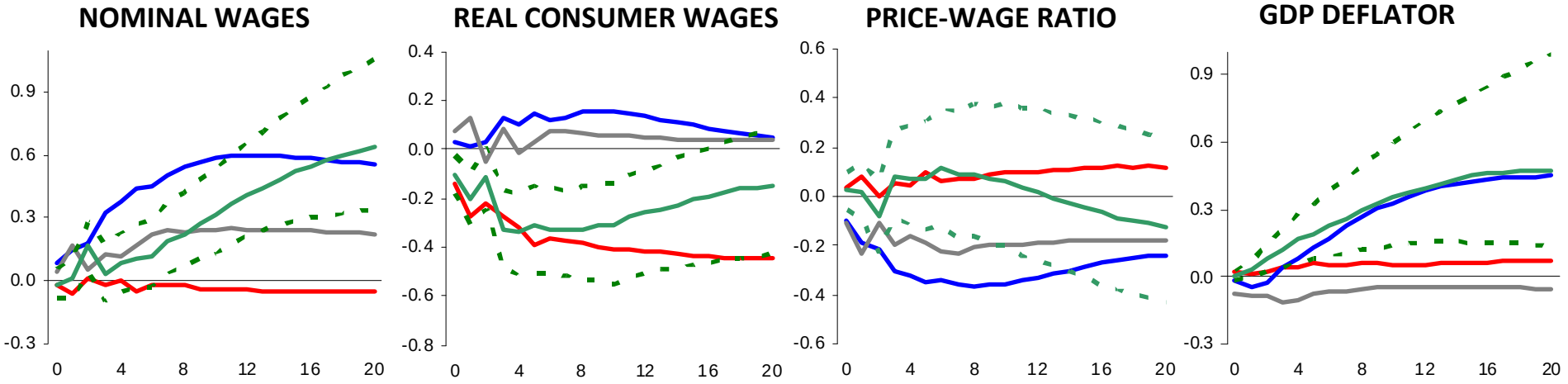
    - **Switzerland**: price-wage ratio constant but considerable increase of nominal wages (**second-round effects**)



2. Pass-through to inflation

- **Demand effects and impact on economic activity**

  To shed some light on these effects, we evaluated the response of **GDP, consumption, investment and the interest rate**.

  - **Japan:** lack of interest rate reaction and absence of a loss in purchasing power in the long-run for consumers, results in insignificant reaction of private consumption and investment
  - **US :** immediate fall in consumption (**income and precautionary savings effect**), but no significant reaction of investment and no interest rate response
  - **Euro Area and Switzerland:** consumption and investment decline with a considerable delay, which can be explained by the strong and significant interest rate tightening (**monetary policy effect**)

3. Time-varying effects of oil shocks

- **Has the impact changed over time?**
  - **Macroeconomic structure** has changed
  - Structural changes in the **oil market**: Baumeister and Peersman (2008) document a considerably steeper or less elastic oil demand curve over time, which distorts comparisons over time
- However, **cross-country dimension** avoids this normalisation problem by comparing **relative changes**:

If the role and share of oil and energy in the economy is important for time variation: changes in effects over time should be more favourable for countries that improved their net oil and energy position the most over time

→ **Is indeed the case**

Conclusions

- **Economic consequences of oil shocks and associated monetary policy implications depend on the source of oil price shift**
  - Oil supply shock: permanent fall of GDP in energy-importing countries, insignificant or even positive response in energy-exporting countries
  - Oil demand shock driven by economic activity: temporary increase of output in all countries
  - Oil-specific demand shock: transitory decline of output
- **Pass-through to consumer prices very different across countries**
  - No inflationary effects in energy exporters because of exchange rate appreciation
  - US and Japan: fast pass-through which is a combination of direct and cost effects
  - Euro area and Switzerland: slow and stronger pass-through because of the existence of second-round effects, strong monetary policy response
- **Has the impact changed over time?**
  - Countries that improved their net energy position the most over time became also relatively less vulnerable to oil supply shocks compared to other countries