The economic impact of Russia's invasion of Ukraine on European countries – a SVAR approach

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Motivation and research question

- **Why?** Surge in energy prices, financial market turmoil and economic concerns after onset of Russia's war on Ukraine Plot
- **What?** Quantify the impact of the war in Ukraine on European countries (DE, FR, IT, UK, CH)
  - Study historical geopolitical conflicts that are *similar* to Russia's war on Ukraine
  - Similar = conflicts associated with energy supply disruptions
- **How?** SVAR analysis
  - Zero, sign, and narrative restrictions
  - Separate VAR for each country with global (block-exogenous) and country-specific part (allowing for country-specific effects)

Geopolitical conflicts and oil prices

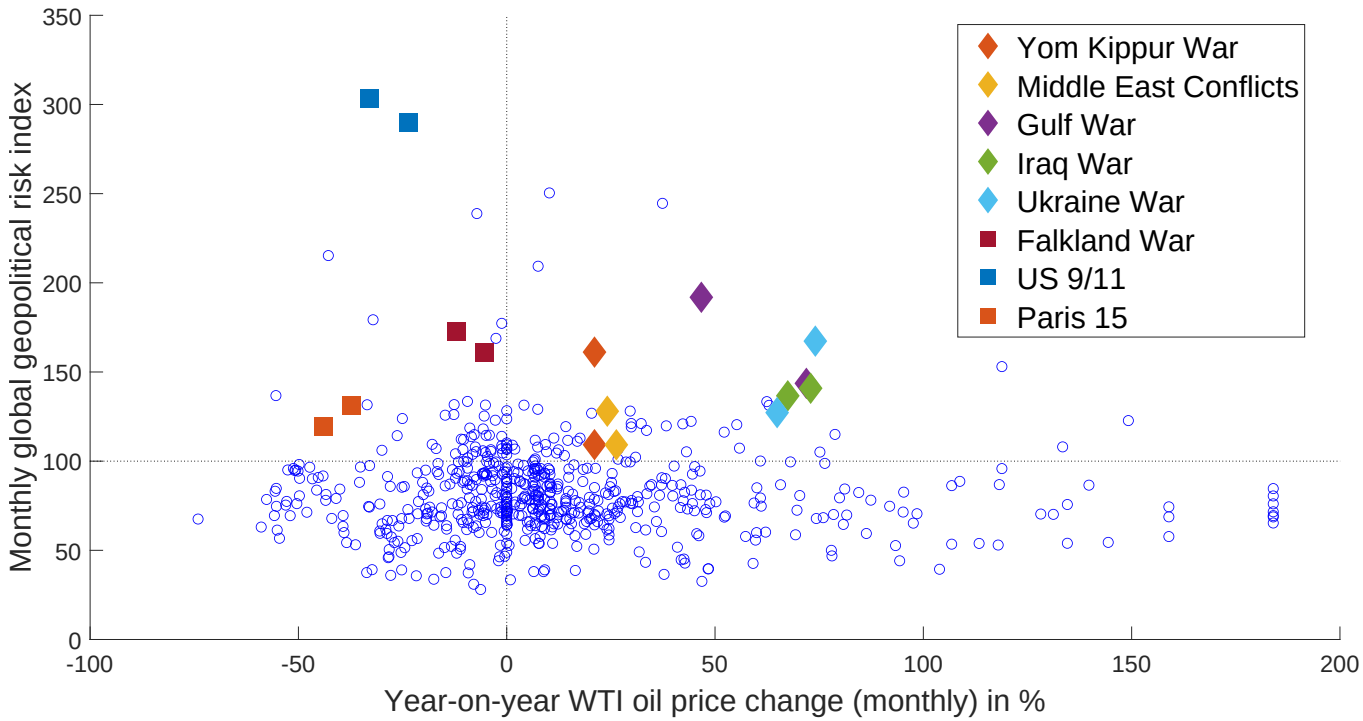


Figure: Scatterplot of monthly oil price change (yoy) and geopolitical risk (GPR) index from January 1970 to December 2022

Results

- Our identified shock...
  - raises inflation
  - lowers consumer confidence
  - lowers GDP
- If Russia had not attacked or threatened Ukraine, by 2022Q4...
  - CPI inflation would have been 0.7pp to 2.4pp lower
  - GDP would have been 0.3% to 1.8% higher
- Geopolitical conflicts and energy prices only part of the explanation of the recent spike in inflation

Data

Global block

- Global GPR index (Caldara and Iacoviello 2022)
- Oil price inflation
- US short-term interest rate
- Global real GDP growth
- Global CPI inflation
- Global consumer sentiment
- US industrial production (excl. military and energy)

Country-specific block

- Energy CPI inflation
- Short-term interest rate
- Real GDP growth
- CPI inflation
- Consumer sentiment

Sample period: 1973Q1–2022Q4

Identification strategy

- Combination of zero and sign restrictions (Uhlig 2005) with narrative sign restrictions (Antolín-Díaz and Rubio-Ramírez 2018) to identify the impact of similar conflicts.
- Separate identification of a global and a country-specific channel
- Country-specific channel captures disproportional exposure of European countries to the War in Ukraine

VAR specification

Zero and sign restrictions

	$u_{t,GPR}$	$u_{t,GPR,2}$	$u^{local}_{t,energy}$
	Global block		
GPR	+	+	0
Oil price inflation	+	−	0
Industrial production[1]	−		0
	Country-specific block		
Energy inflation			+
GDP			−

Table: Zero and sign restrictions on the identification matrix

1. excl. military and energy

Narrative restrictions

Conflict	*Date*	$u_{t,GPR}$	$u^{local}_{t,energy}$
Yom Kippur War	1973Q4	+	
Middle East Conflicts	1980Q1	+	
Gulf War	1990Q3–1990Q4	+	
Iraq War	2002Q4–2003Q1	+	
Ukraine War	2022Q1–2022Q2	+	+

Table: Narrative restrictions

Impulse responses – global channel

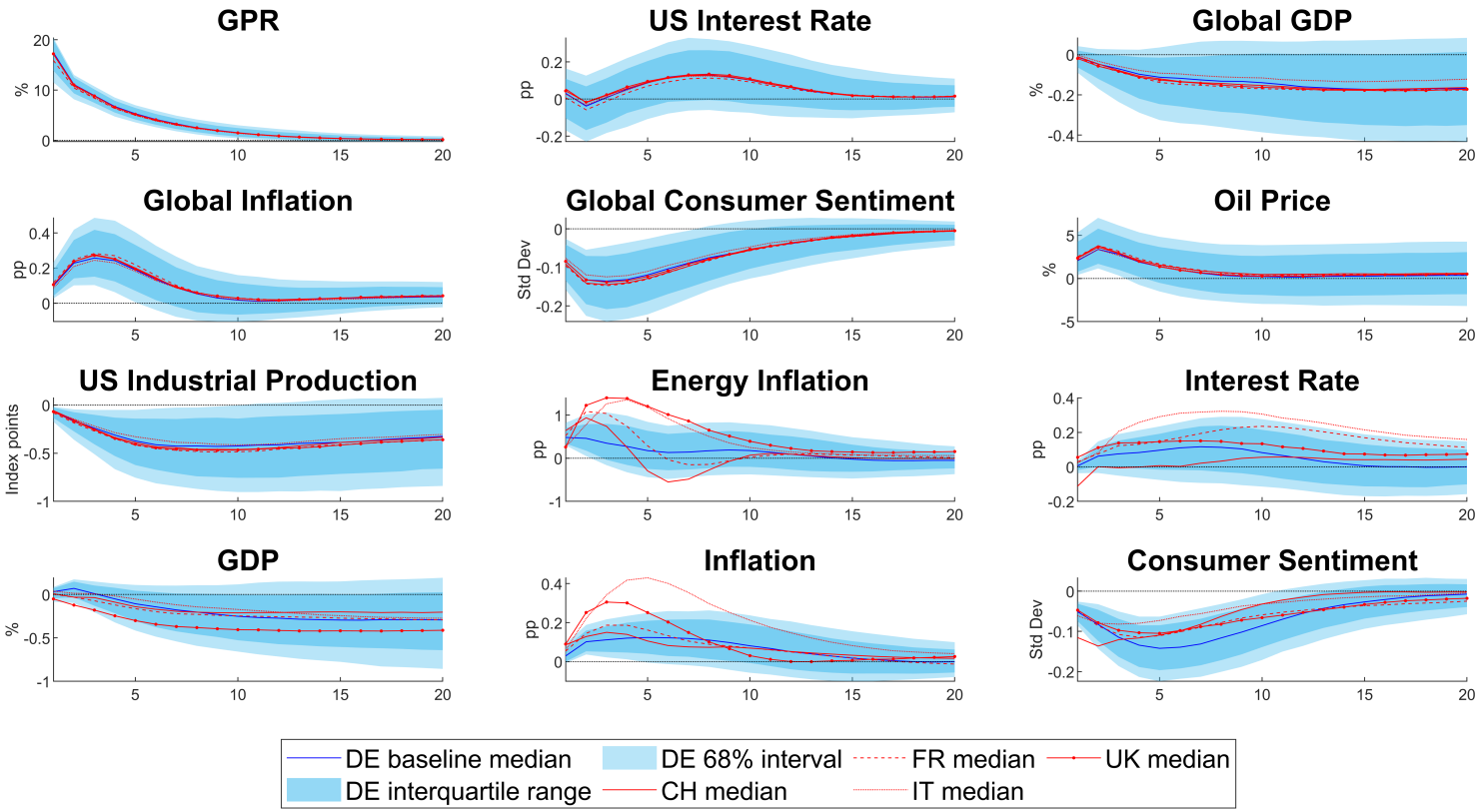


Figure: Impulse responses to a one std geopolitical conflict shock associated with fears of disruption or actual disruption in energy supply

Shock series Second shock

Impulse responses – country-specific channel

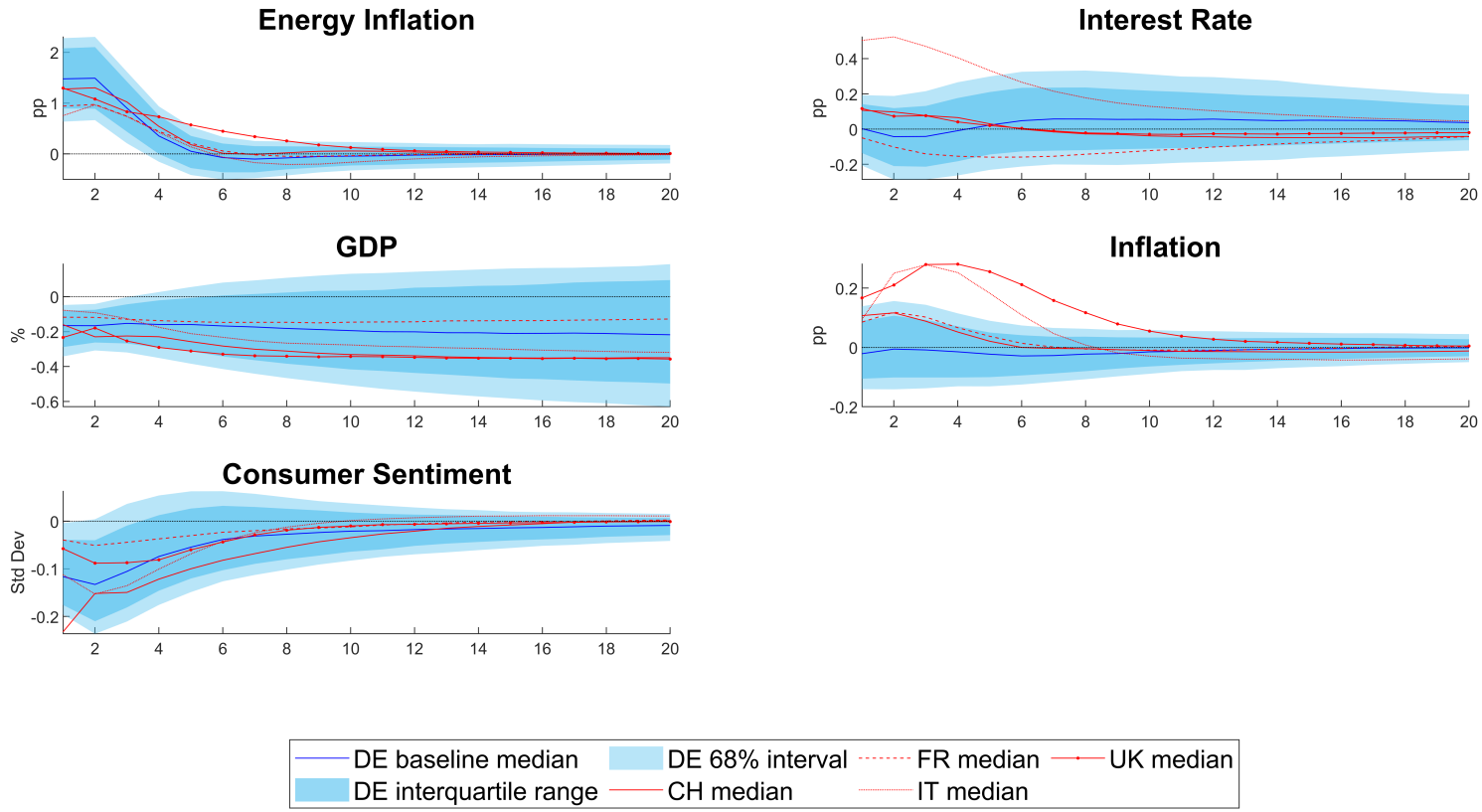


Figure: Impulse responses to a one std country-specific contractionary energy supply shocks

Shock series

Counterfactual – Germany

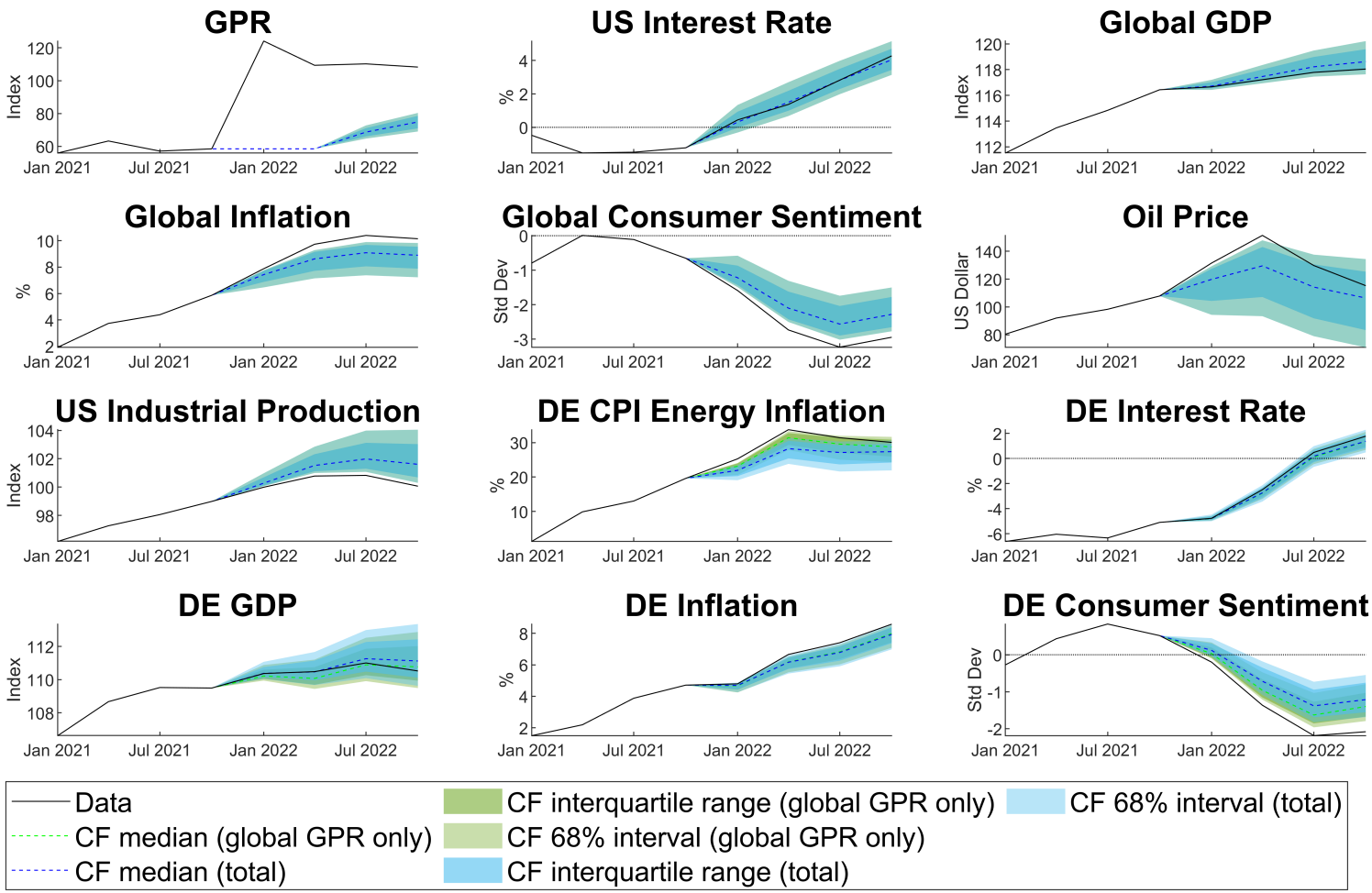


Figure: Counterfactual if Russia had not attacked Ukraine

France

Counterfactual

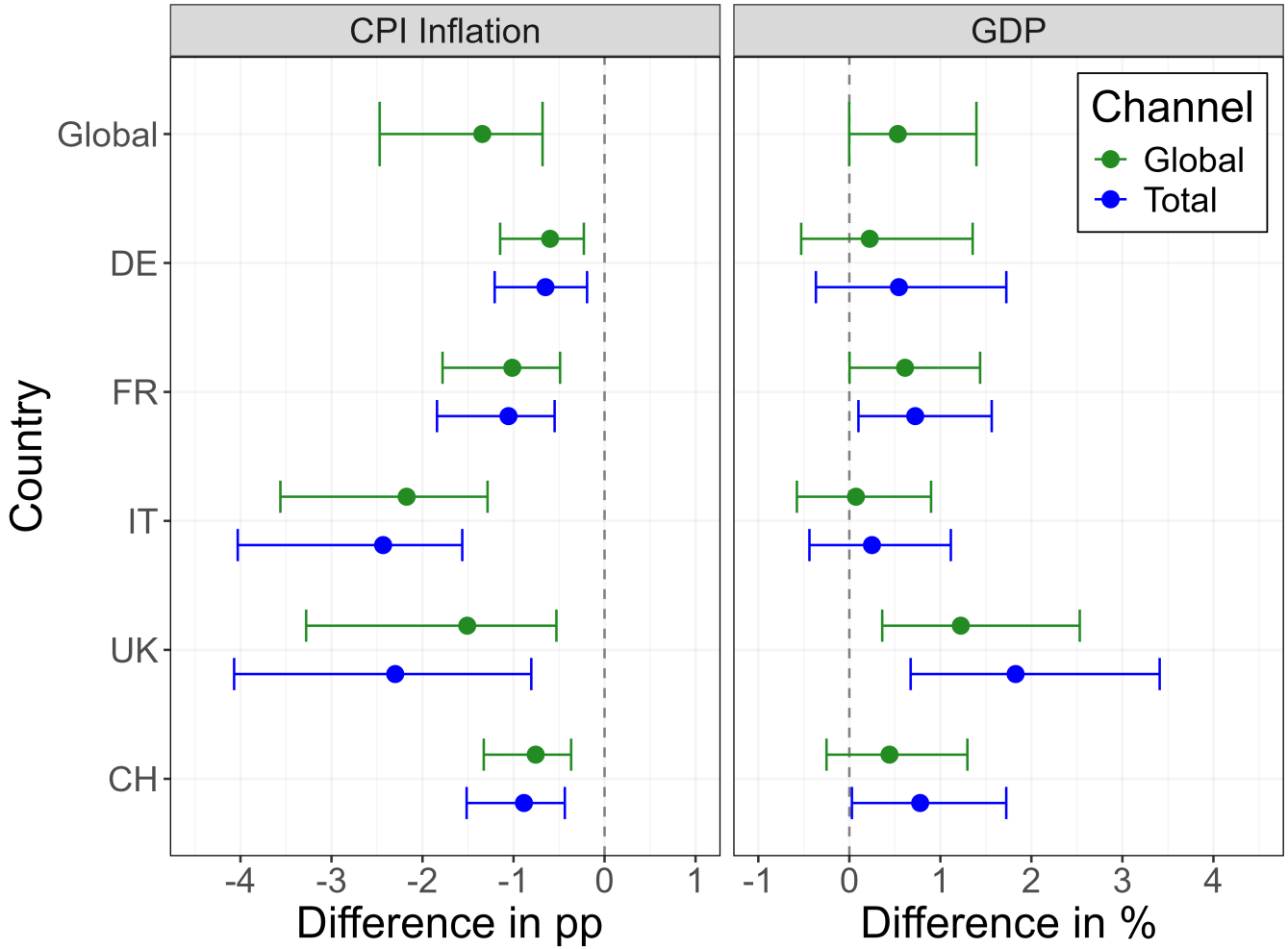


Figure: Difference to no-war counterfactual by 2022-Q4

Conclusion

- Application of a SVAR to quantify the economic effects of Russia's war on Ukraine
- Main model features
  - global (block-exogenous) and country-specific part
  - combination of zero, sign and narrative restrictions
- Our analysis suggests that if Russia had not attacked or threatened Ukraine, by the end of 2022...
  - CPI inflation of the countries considered would have been 0.7pp to 2.4pp lower
  - GDP of the countries considered would have been 0.3% to 1.8% higher

References

- Antolín-Díaz, Juan, and Juan F Rubio-Ramírez. 2018. "Narrative sign restrictions for SVARs." *American Economic Review* 108 (10): 2802–29.
- Caldara, Dario, and Matteo Iacoviello. 2022. "Measuring Geopolitical Risk." *American Economic Review* 112 (4): 1194–1225.
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Energy prices

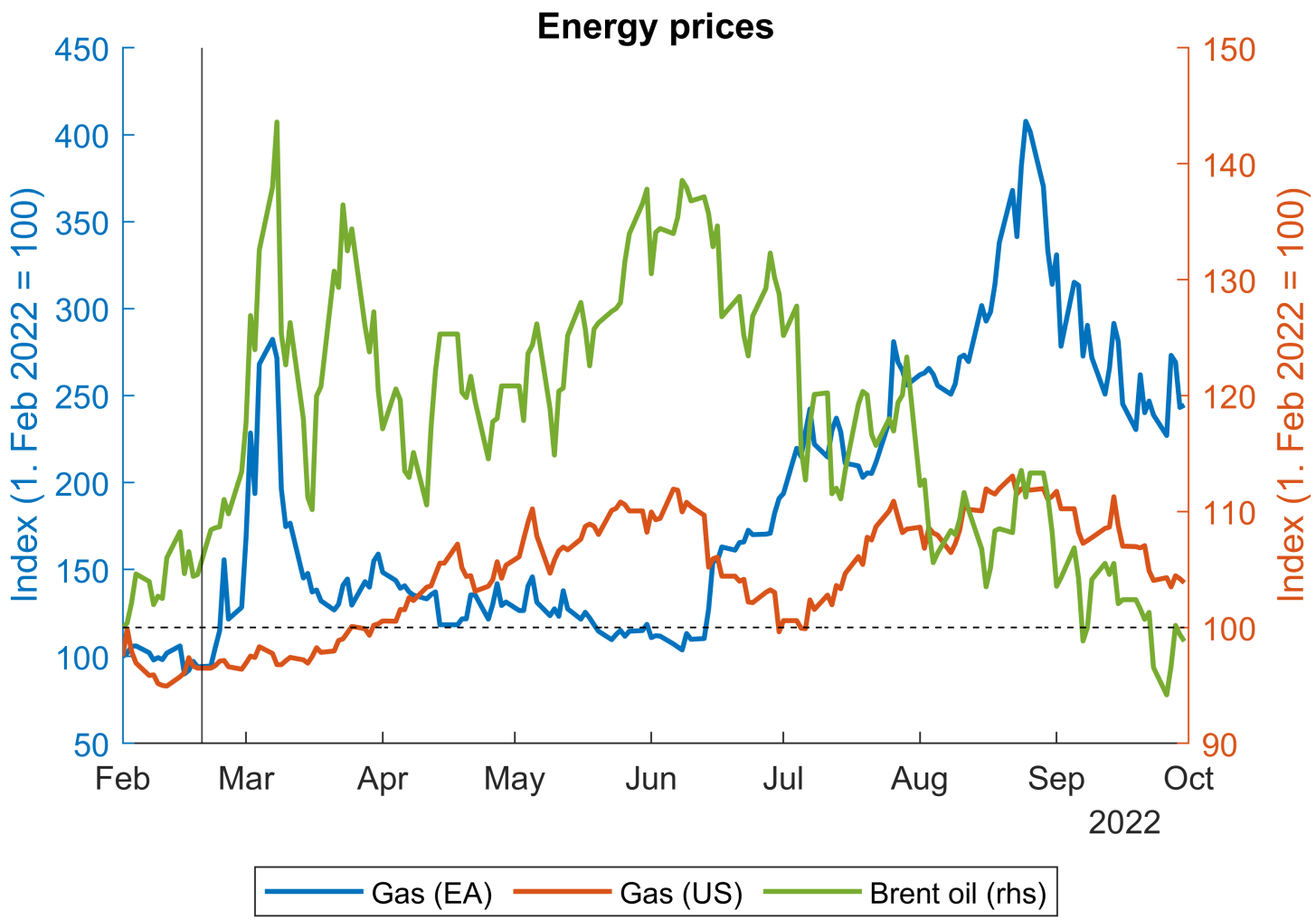


Figure: Energy prices

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Baseline VAR specification

$$\underbrace{\begin{pmatrix} g_t \\ d_t \end{pmatrix}}_{Y_t} = \underbrace{\begin{pmatrix} \theta_{0,g} \\ \theta_{0,d} \end{pmatrix}}_{\Theta_0} + \underbrace{\begin{pmatrix} \theta_{1,gg} & 0 \\ \theta_{1,dg} & \theta_{1,dd} \end{pmatrix}}_{\Theta_1} \underbrace{\begin{pmatrix} g_{t-1} \\ d_{t-1} \end{pmatrix}}_{Y_{t-1}} + \underbrace{\begin{pmatrix} \theta_{2,gg} & 0 \\ \theta_{2,dg} & \theta_{2,dd} \end{pmatrix}}_{\Theta_2} \underbrace{\begin{pmatrix} g_{t-2} \\ d_{t-2} \end{pmatrix}}_{Y_{t-2}} + \underbrace{\begin{pmatrix} \varepsilon_{g,t} \\ \varepsilon_{d,t} \end{pmatrix}}_{\varepsilon_t}$$

g_t: block-exogenous global variables; d_t: country-specific variables

The VAR is estimated using a Bayesian estimation approach

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Global conflict shocks

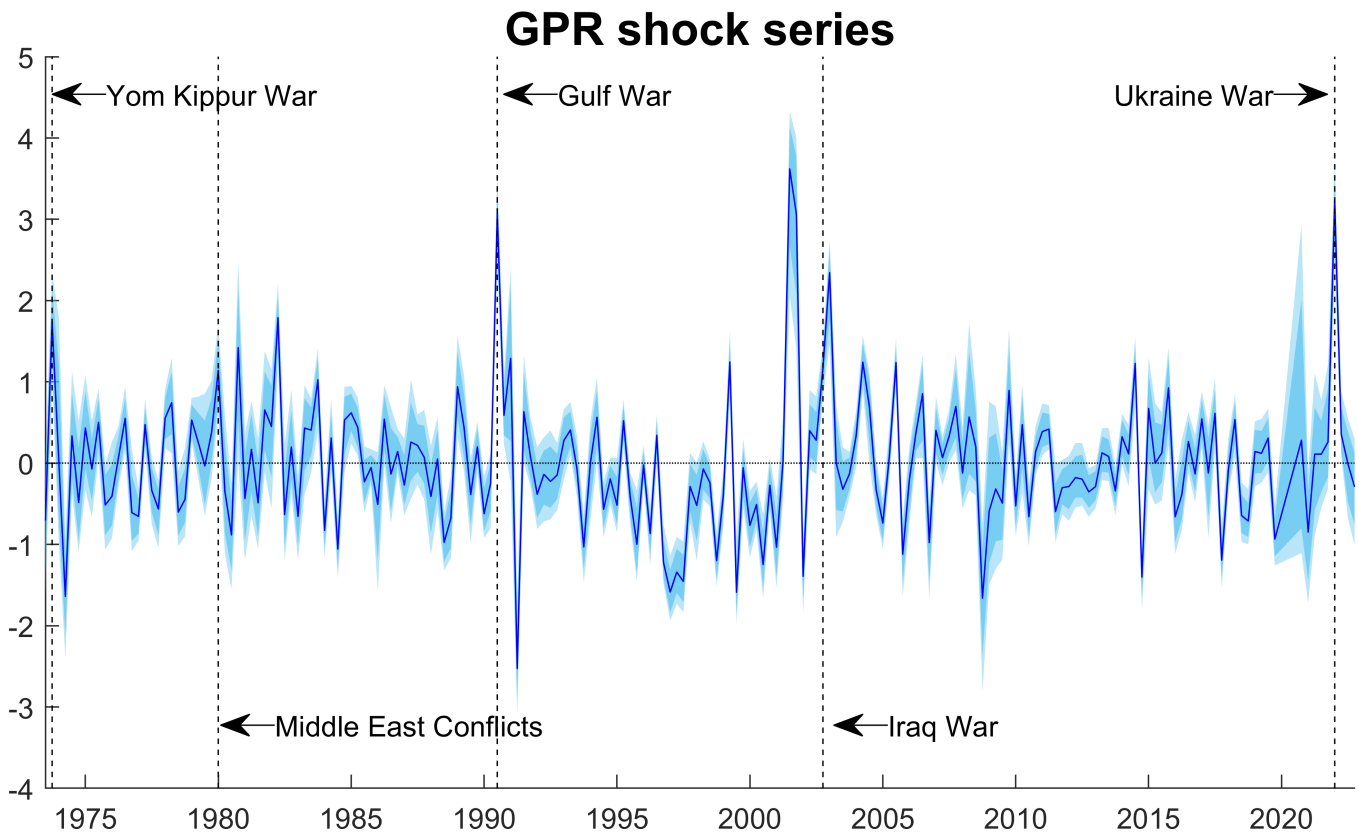


Figure: Series of geopolitical conflict shocks associated with fears of disruption or actual disruption in energy supply

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Impulse responses – global channel

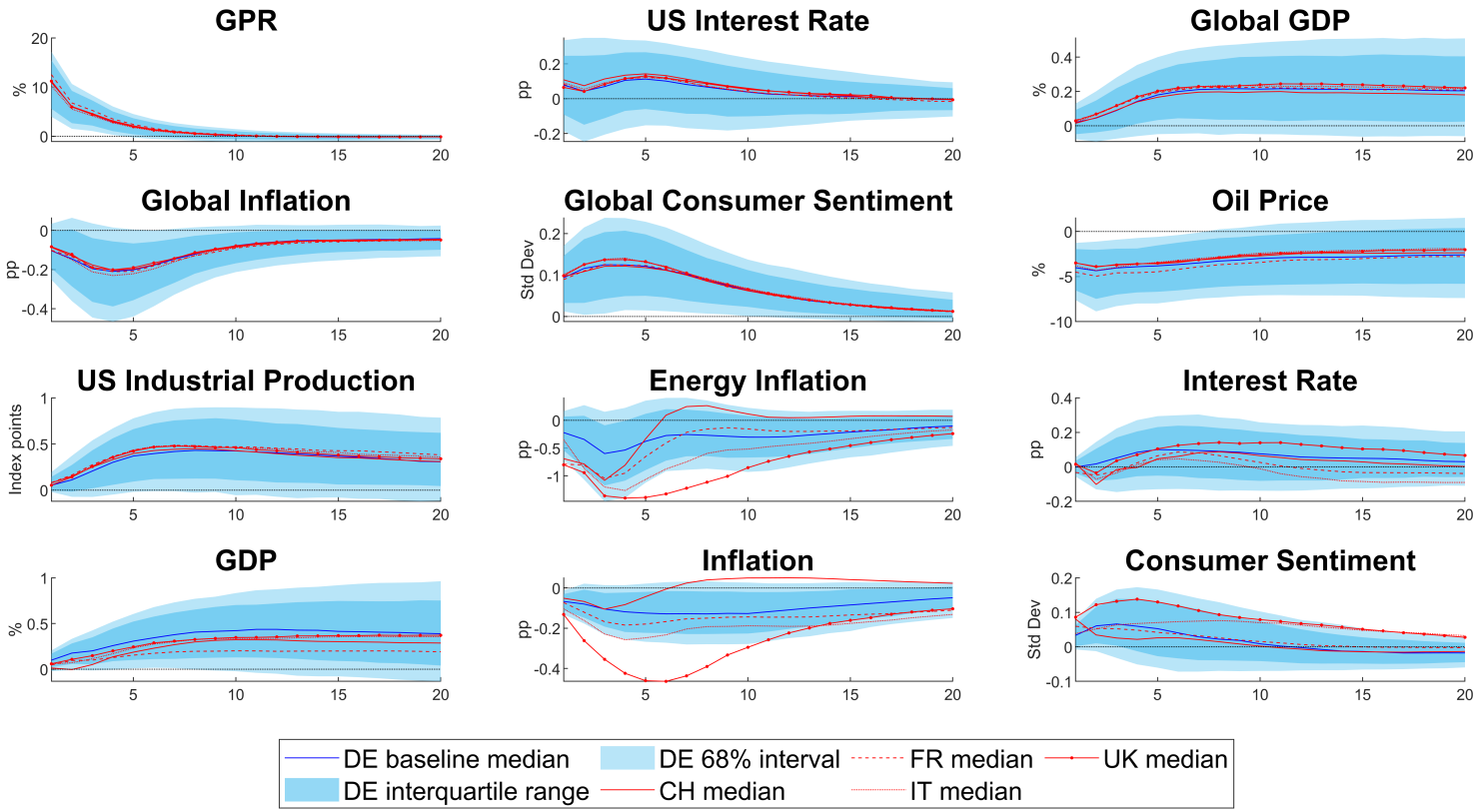


Figure: Impulse responses to a one std geopolitical conflict shock *not* associated with fears of disruption or actual disruption in energy supply

Shock series Back

Global conflict shocks (non-energy)

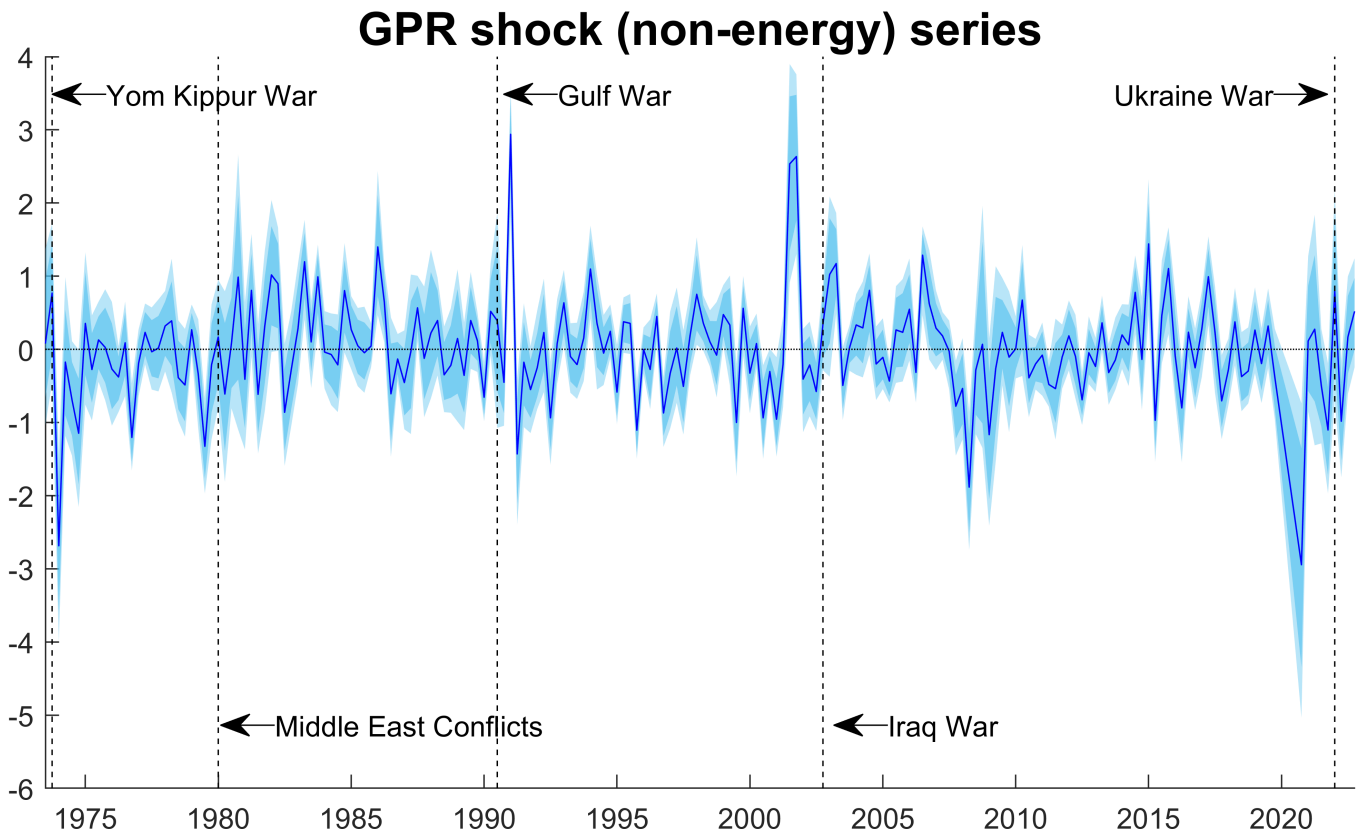


Figure: Series of geopolitical conflict shocks *not* associated with fears of disruption or actual disruption in energy supply

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Local energy supply shocks – Germany

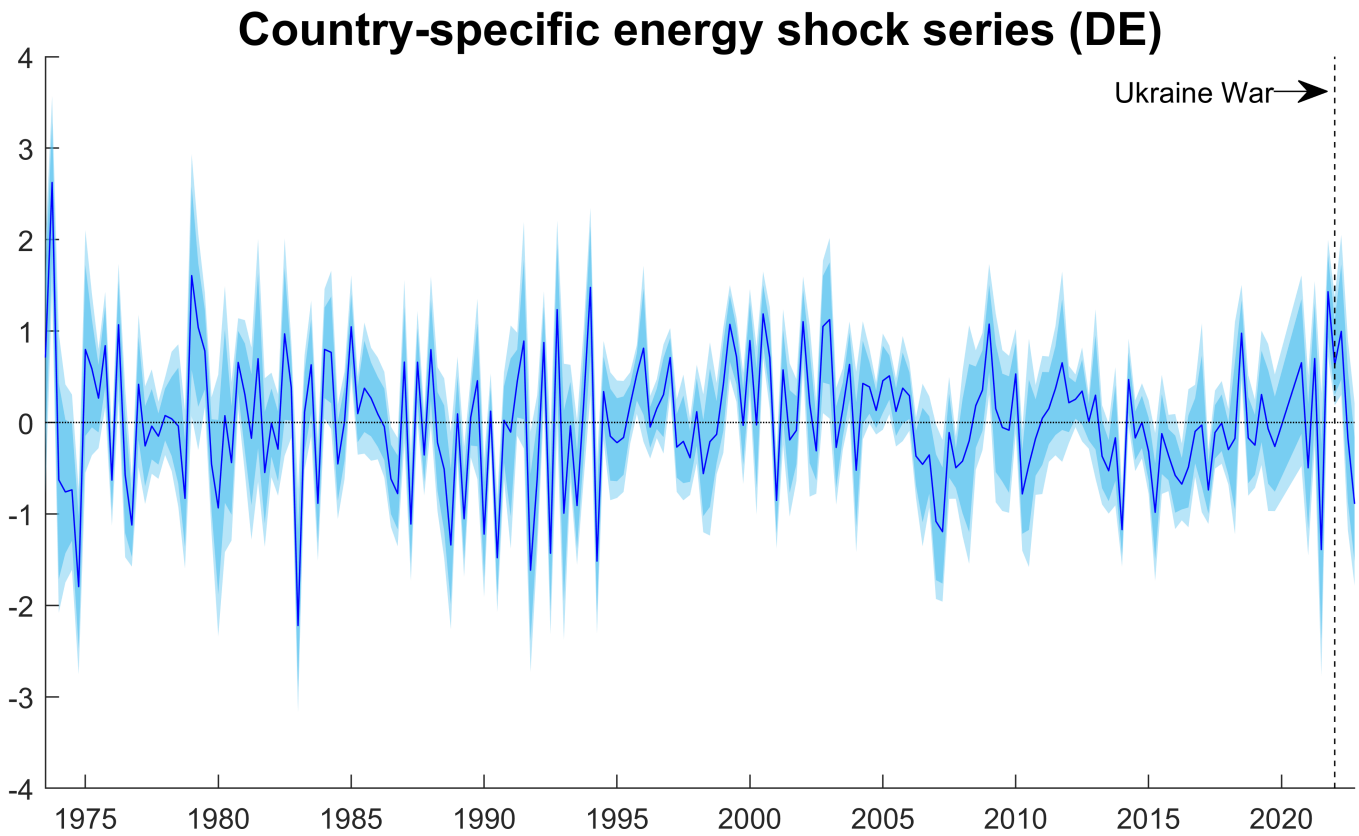


Figure: Energy supply shock series

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Local energy supply shocks – France

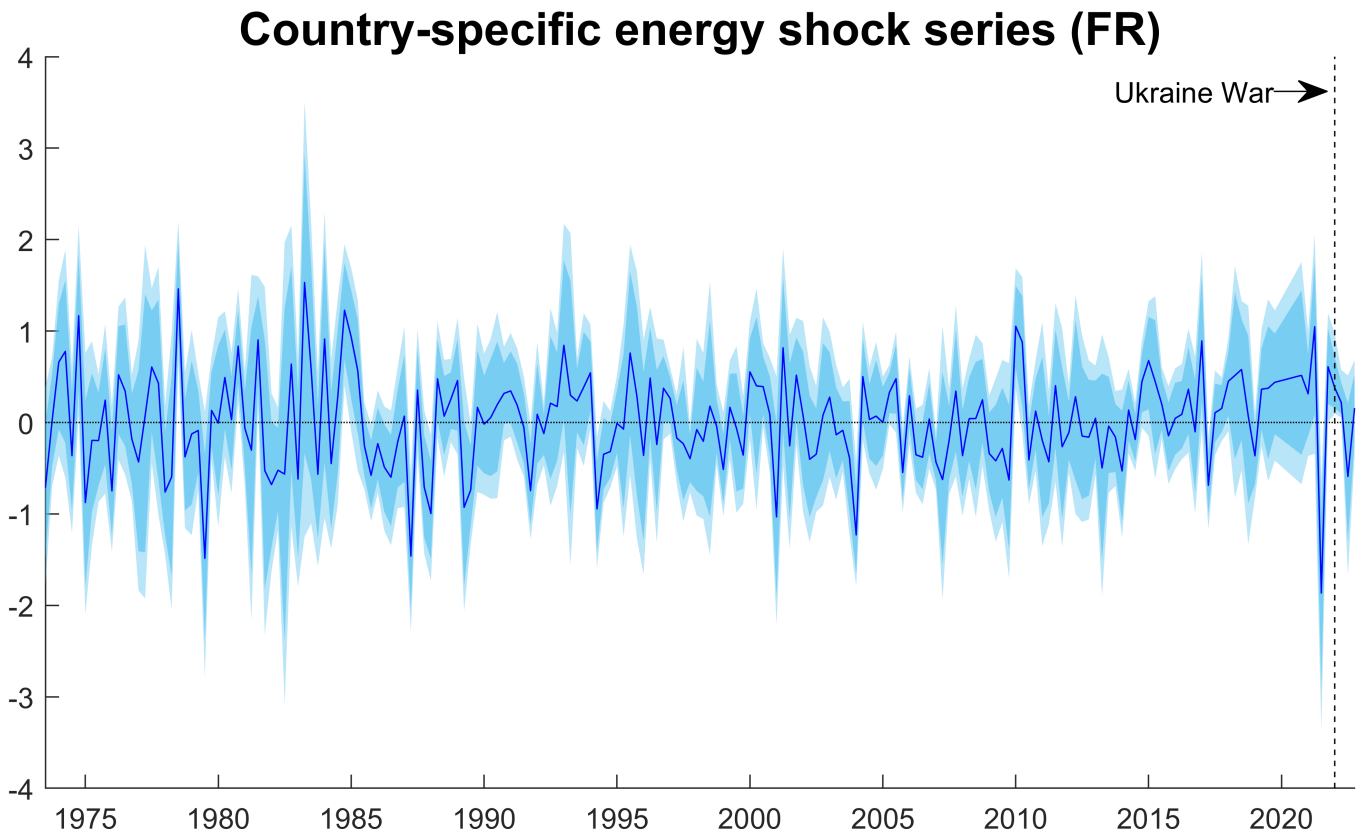


Figure: Energy supply shock series

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Local energy supply shocks – Italy

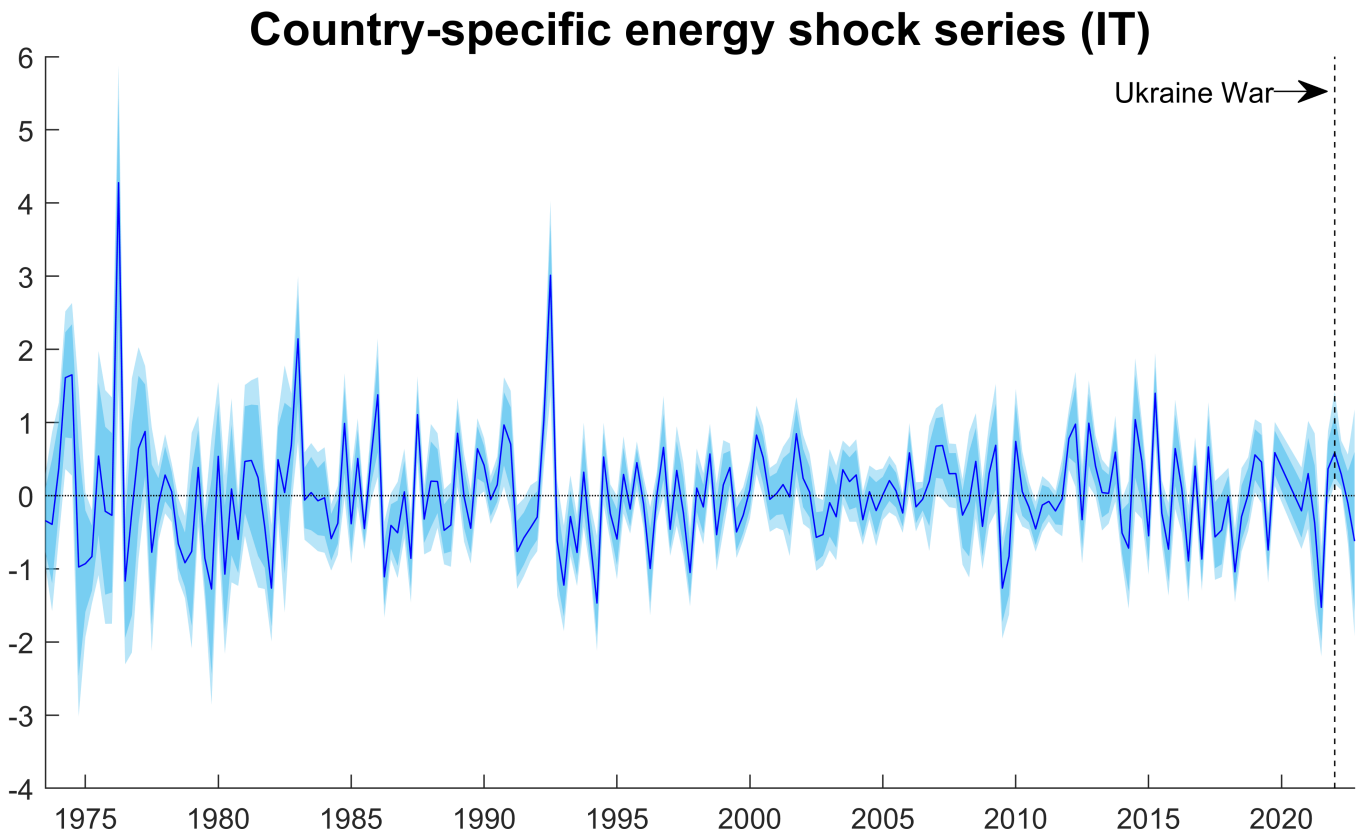


Figure: Energy supply shock series

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Local energy supply shocks – United Kingdom

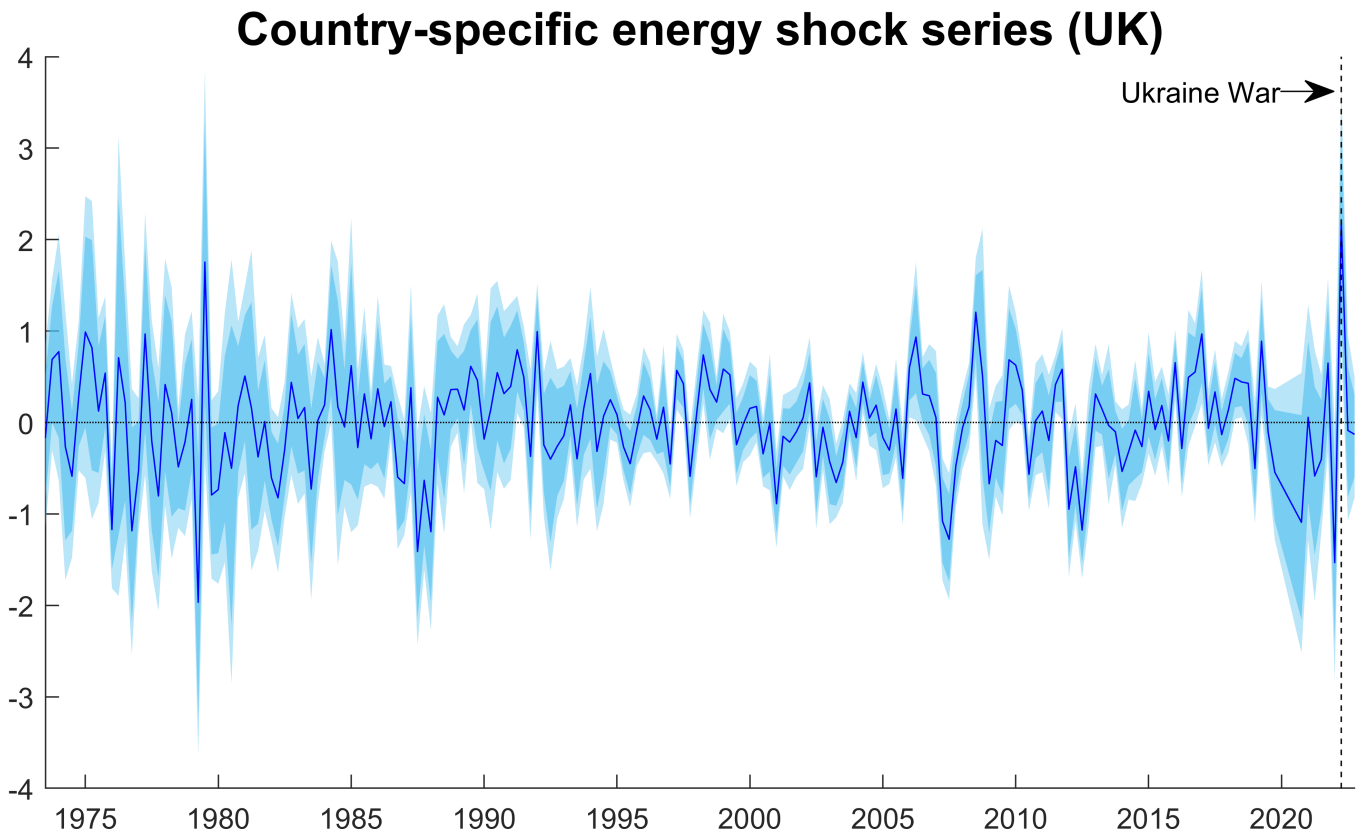


Figure: Energy supply shock series

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Local energy supply shocks – Switzerland

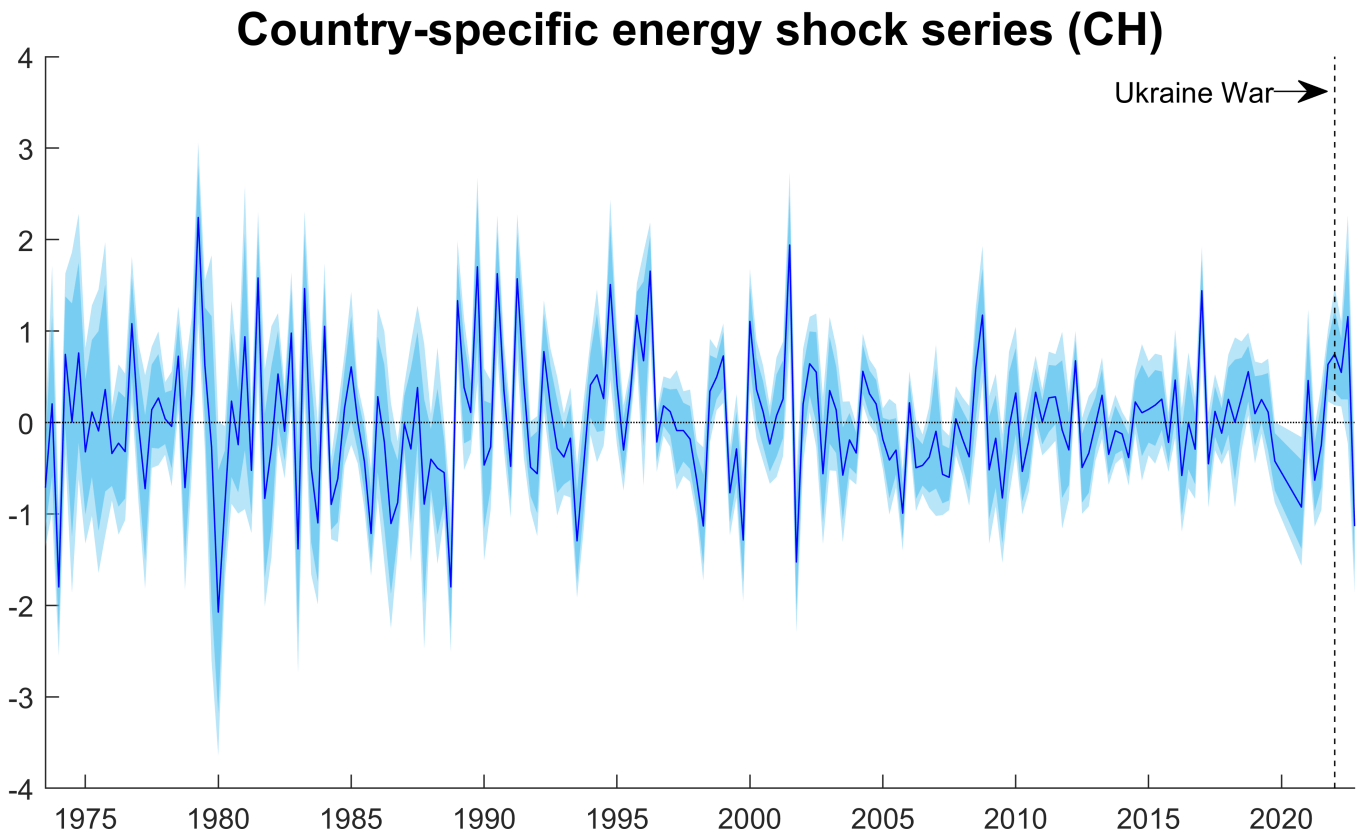


Figure: Energy supply shock series

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Counterfactual – France

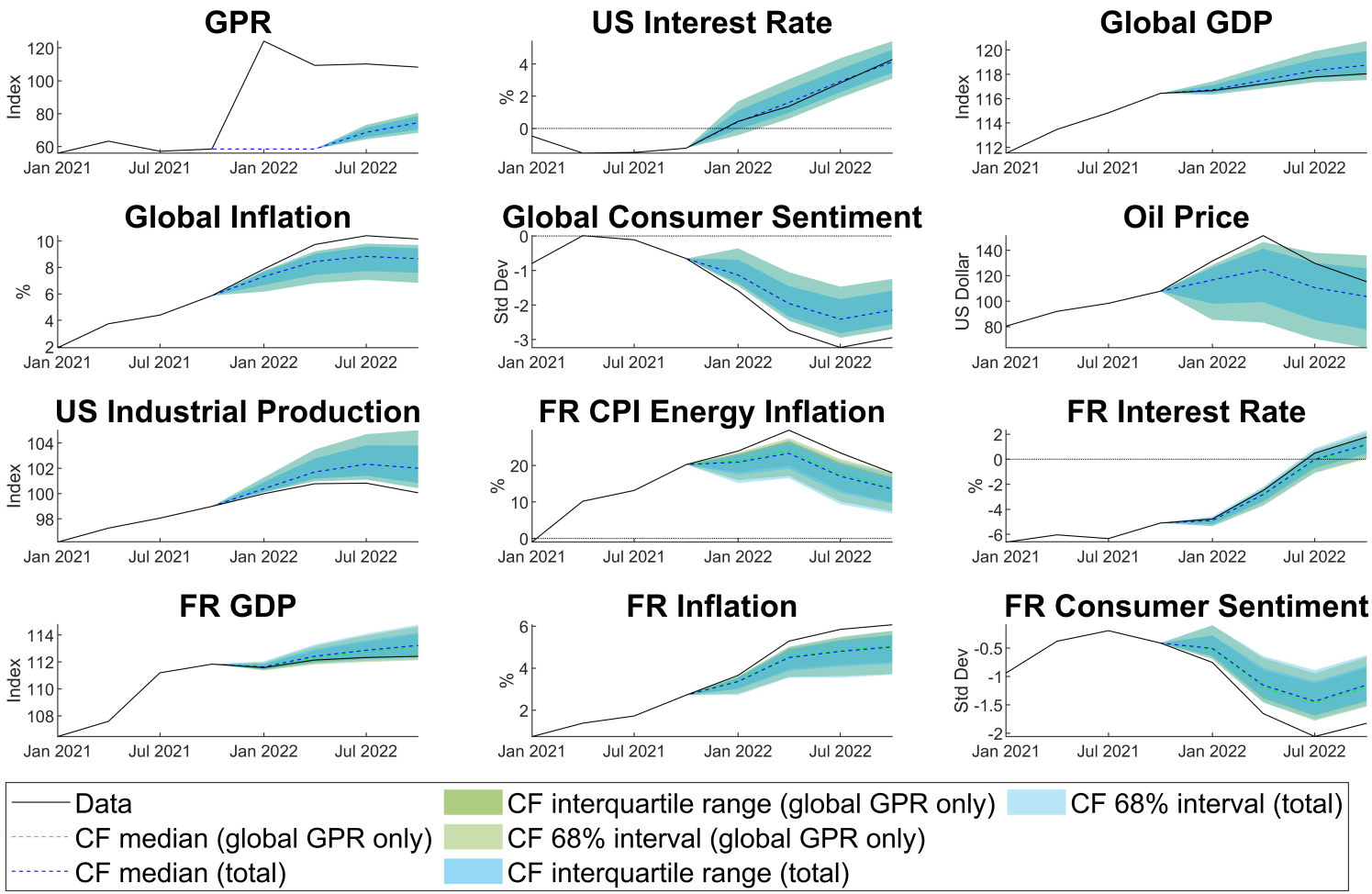


Figure: Counterfactual if Russia had not attacked Ukraine

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Counterfactual – Italy

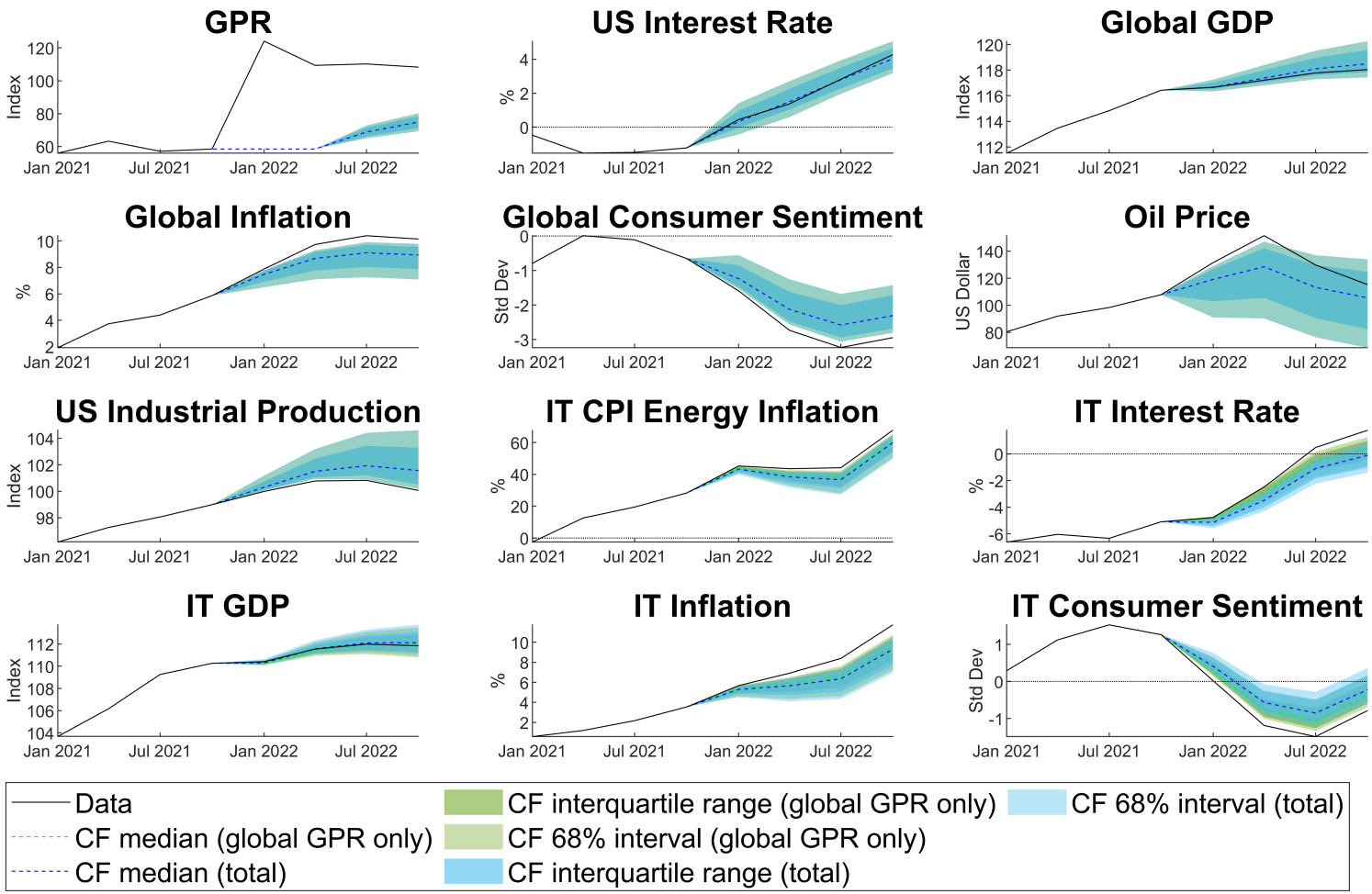


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Counterfactual – United Kingdom

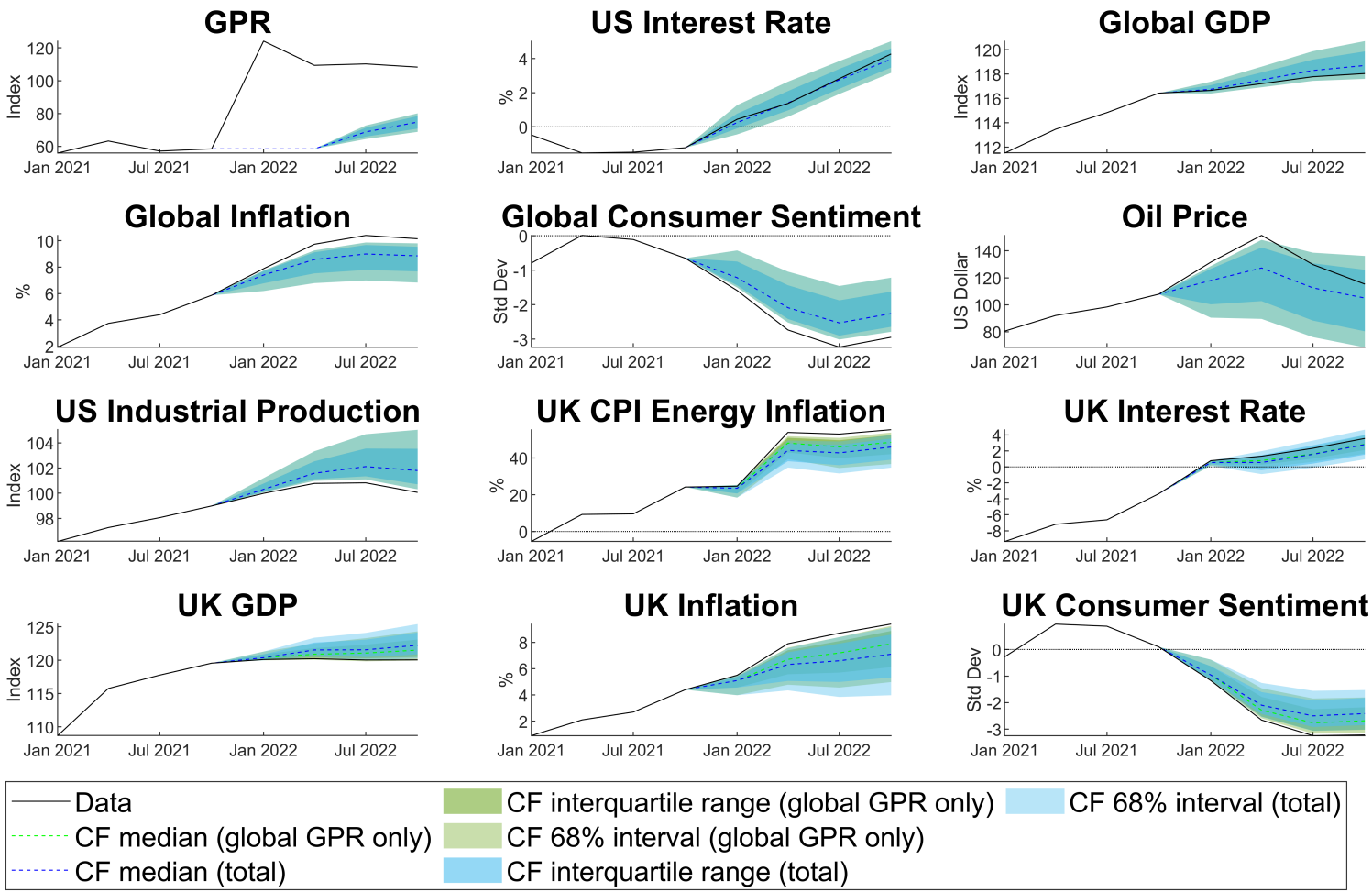


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Counterfactual – Switzerland

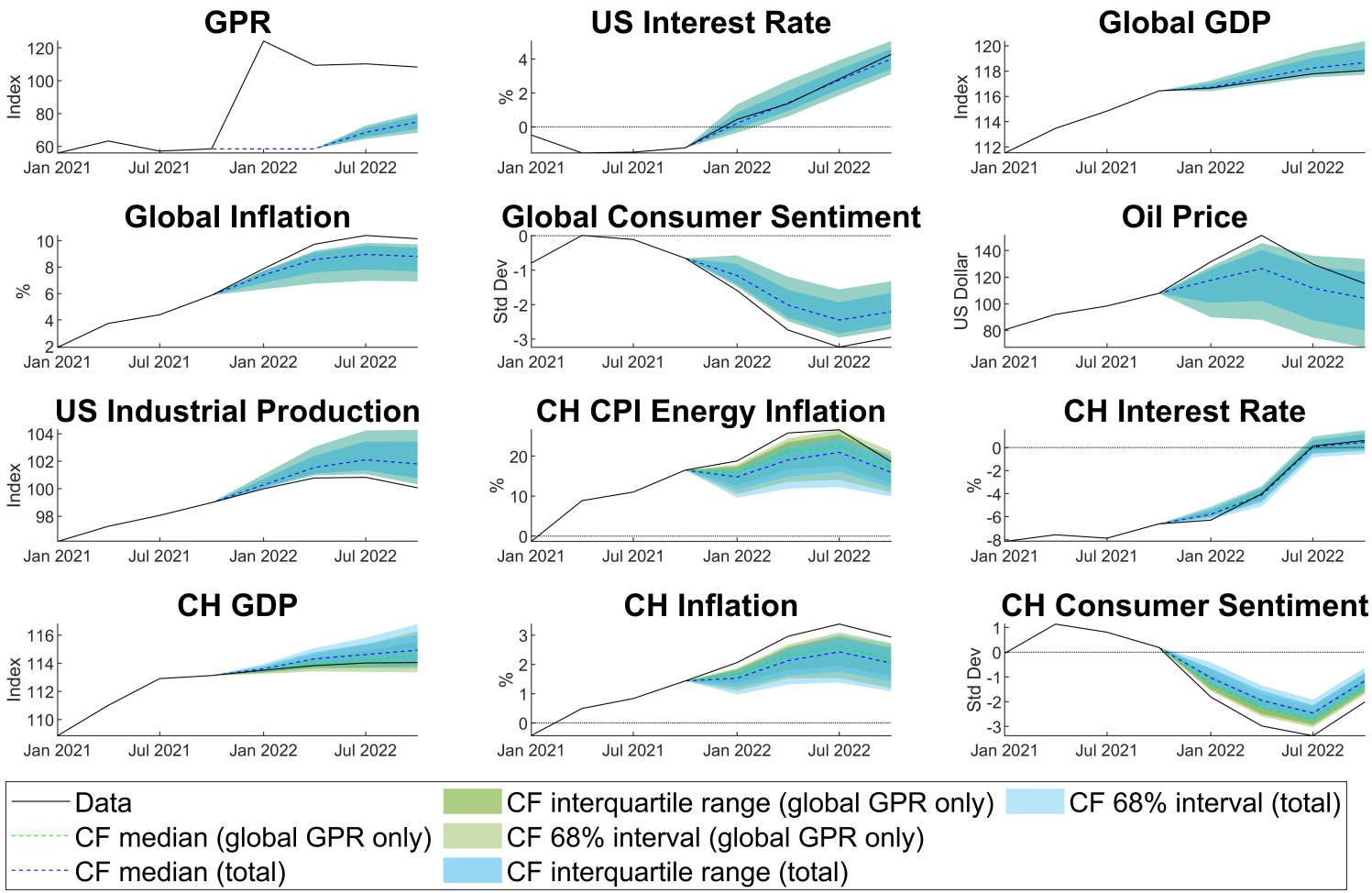


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