

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

Jonas M. Bruhin ¹ Rolf Scheufele ² Yannic Stucki ²

¹University of St. Gallen

²Swiss National Bank

4th Italian Workshop of Econometrics and Empirical Economics
January 25, 2024

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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

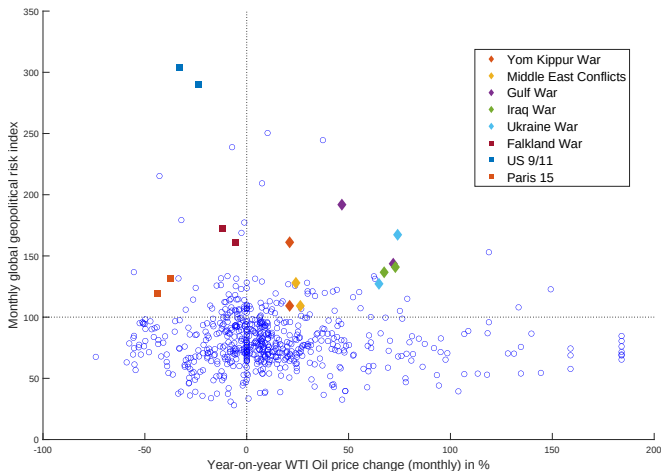


Figure: Scatterplot of monthly oil price change (yoy) and geopolitical risk (GPR) index from January 1970 to December 2022

Results

- Our identified shock...
 - lowers consumer confidence
 - raises inflation
 - lowers GDP insignificantly
- Consumer prices of the countries considered would have been 1% to 3% lower by 2022Q4 if Russia had not attacked or threatened Ukraine
- Geopolitical conflicts and energy prices only part of the story of the recent development

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

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 local channel
- Local channel captures disproportional exposure of European countries to the War in Ukraine

VAR specification

Zero and sign restrictions

	$u_{t,GPR}$	$u_{t,GPR,2}$	$u_{t,energy}^{local}$
<i>Global block</i>			
GPR	+	+	0
Oil price inflation	+	-	0
<i>Local block</i>			
Energy inflation			+
GDP			-

Table: Zero and sign restrictions on the identification matrix

Narrative restrictions

<i>Conflict</i>	<i>Date</i>	$u_{t,GPR}$	$u_{t,energy}^{local}$
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

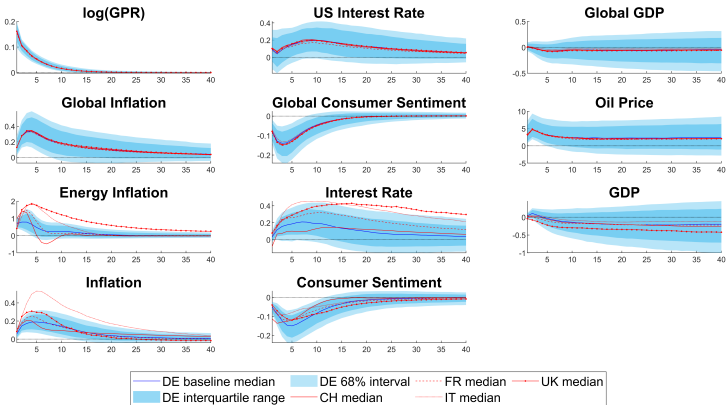


Figure: Impulse responses to a geopolitical conflict shock associated with fears of disruption or actual disruption in energy supply

Shock series

Second shock

Impulse responses – local channel

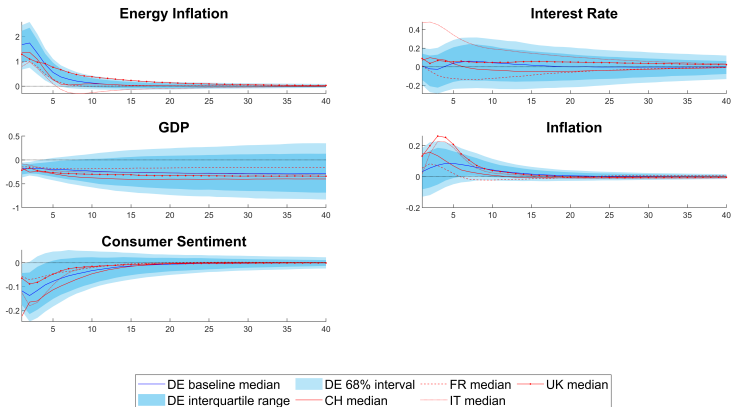


Figure: Impulse responses to country-specific contractionary energy supply shocks

Shock series

Counterfactual – Germany

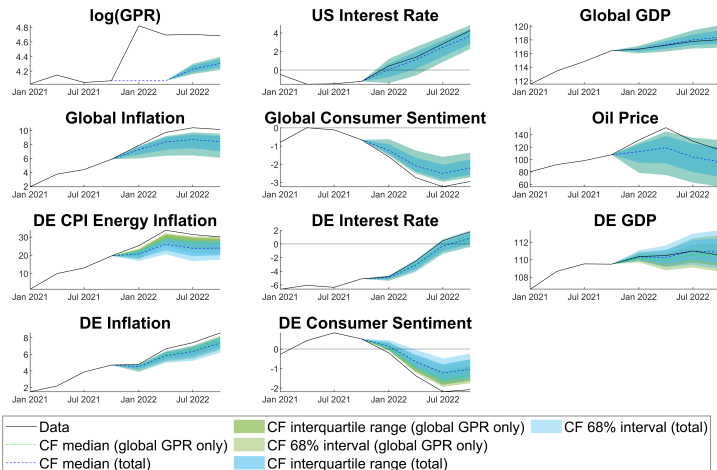


Figure: Counterfactual if Russia had not attacked Ukraine

Counterfactual

<i>Country</i>	<i>CPI (global)</i>	<i>CPI (total)</i>	<i>GDP (global)</i>	<i>GDP (total)</i>
DE	-0.99% [-1.67,-0.54]	-1.21% [-1.90,-0.66]	-0.04% [-1.11,1.21]	0.31% [-0.85,1.72]
FR	-1.39% [-2.45,-0.77]	-1.47% [-2.48,-0.83]	0.35% [-0.37,1.18]	0.52% [-0.23,1.38]
IT	-2.74% [-4.37,-1.69]	-3.09% [-4.61,-1.94]	-0.18% [-1.16,0.73]	0.04% [-0.94,1.00]
UK	-1.57% [-3.03,-0.59]	-1.60% [-3.23,-0.50]	0.90% [-0.13,2.24]	1.09% [-0.43,2.74]

Table: Median percentage difference to no-war counterfactual by 2022-Q4. Interquartile interval in brackets.

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, consumer prices of the countries considered would have been 1% to 3% lower by 2022Q4
- Estimates represent a lower bound

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.
-  Uhlig, Harald. 2005. "What are the effects of monetary policy on output? Results from an agnostic identification procedure." *Journal of Monetary Economics* 52 (2): 381–419.

Energy prices

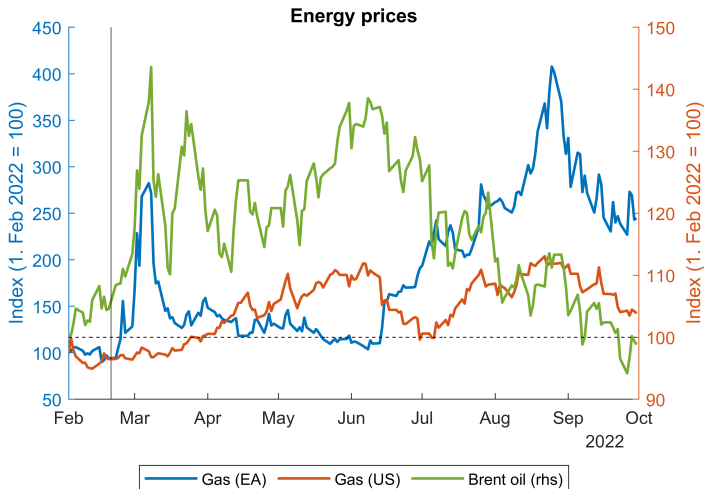


Figure: Energy prices

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

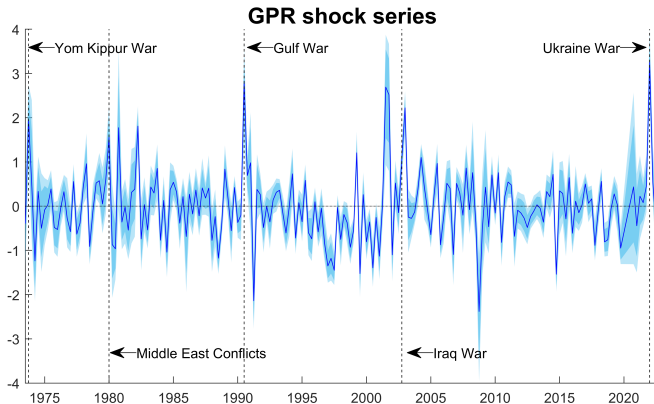


Figure: Series of geopolitical conflict shocks associated with fears of disruption or actual disruption in energy supply

Impulse responses – global channel

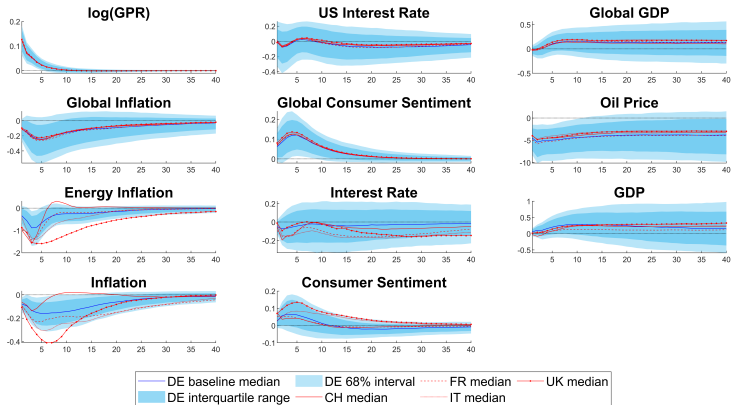


Figure: Impulse responses to a geopolitical conflict shock *not* associated with fears of disruption or actual disruption in energy supply

Shock series

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Global conflict shocks (non-energy)

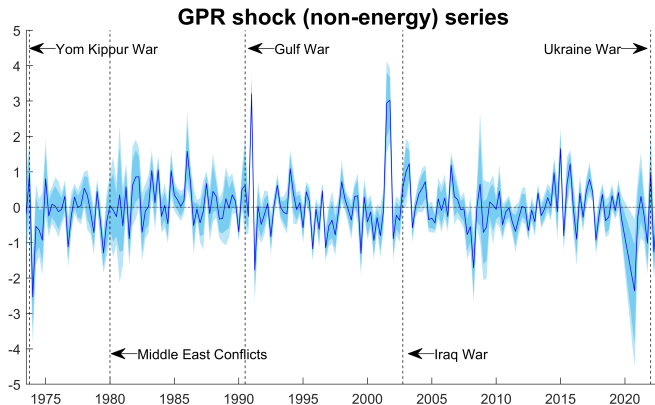


Figure: Series of geopolitical conflict shocks *not* associated with fears of disruption or actual disruption in energy supply

Local energy supply shocks – Germany

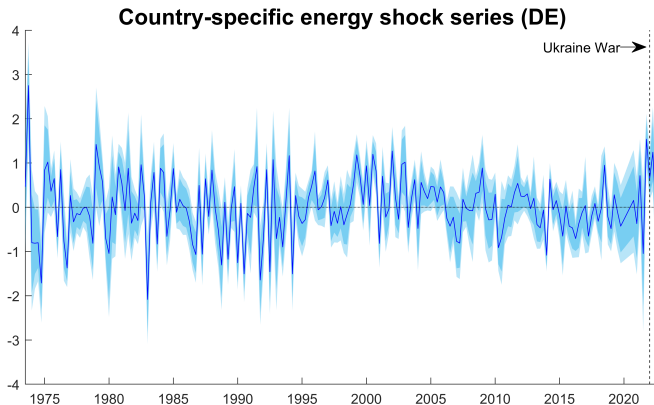


Figure: Energy supply shock series

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Local energy supply shocks – France

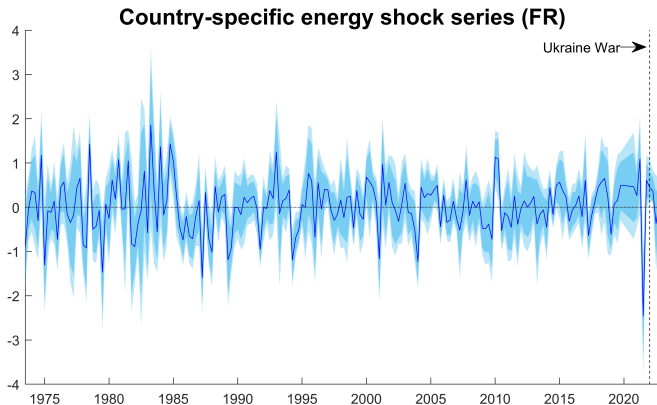


Figure: Energy supply shock series

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Local energy supply shocks – Italy

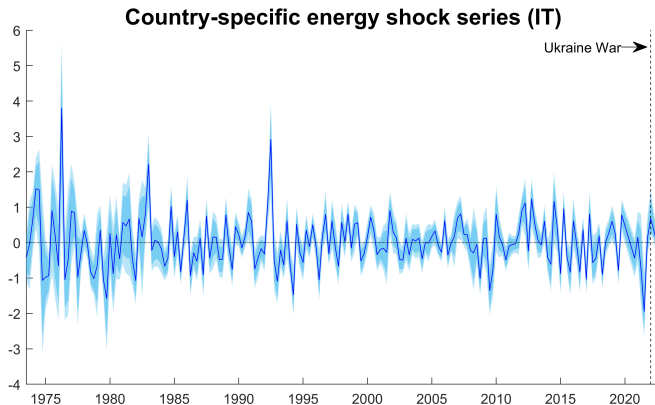


Figure: Energy supply shock series

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Local energy supply shocks – United Kingdom

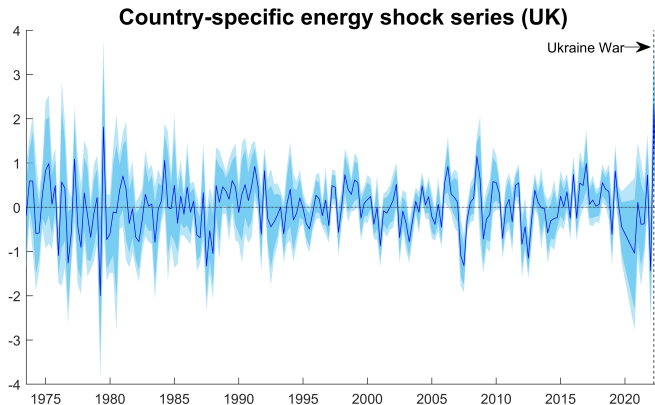


Figure: Energy supply shock series

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Local energy supply shocks – Switzerland

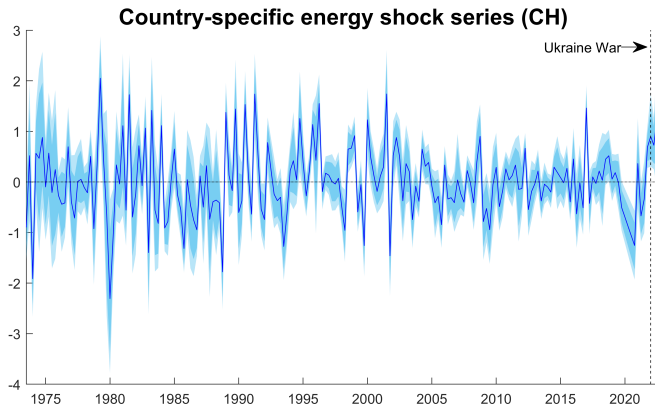


Figure: Energy supply shock series

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Counterfactual – Italy

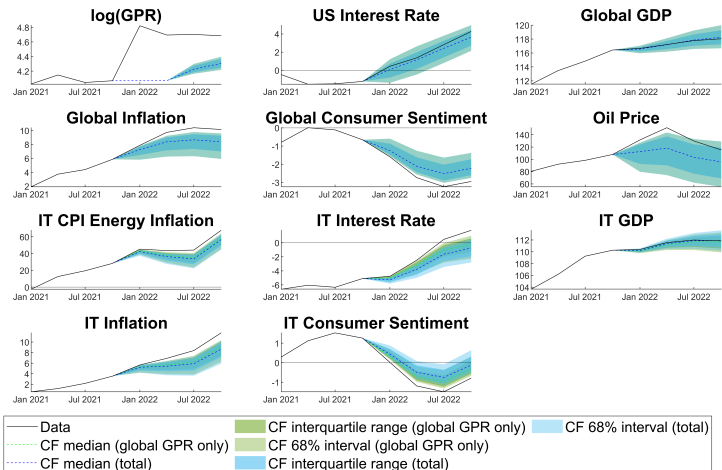


Figure: Counterfactual if Russia had not attacked Ukraine

Counterfactual – France

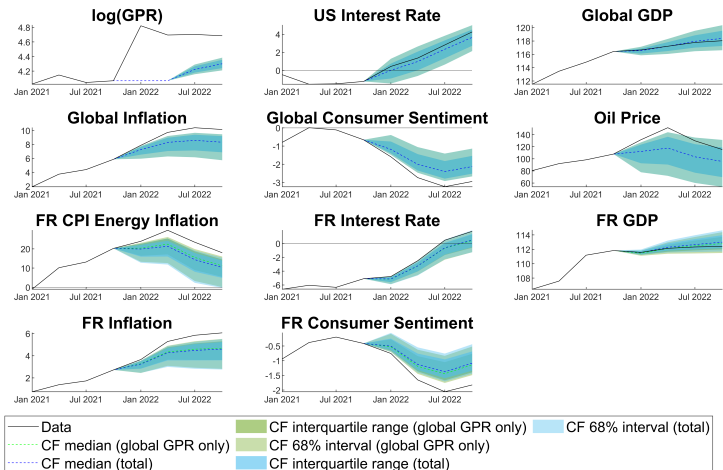


Figure: Counterfactual if Russia had not attacked Ukraine

Counterfactual – United Kingdom

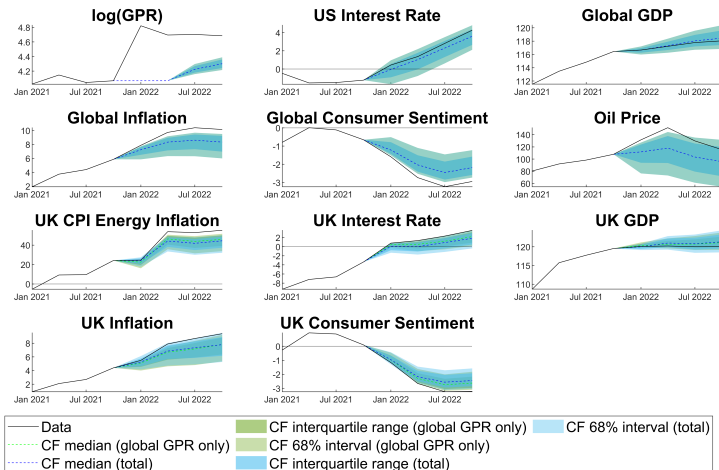


Figure: Counterfactual if Russia had not attacked Ukraine

Counterfactual – Switzerland

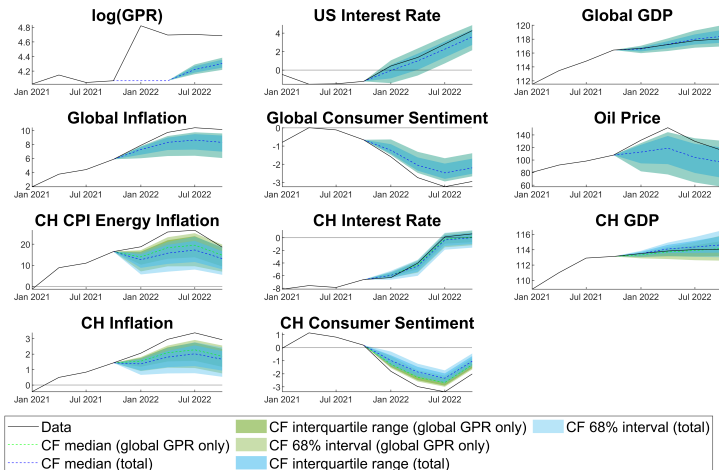


Figure: Counterfactual if Russia had not attacked Ukraine