The effect of war-caused economic uncertainty on output: evidence from selected European countries.

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Introduction

Motivation

- The turmoil situation after the invasion of Russia in Ukraine (February 24th, 2022) and the consequent economic uncertainty.
- Both Russia and Ukraine are important economic players for the global and especially the European economy.
  - Russia: largest exporter of natural gas (Ringim et al., 2022)
  - both Russia and Ukraine: significant fertilizers and food exporters to the EU (Bodnár et al., 2022)
- Several economic implications of the war have been examined, but the research on the war-caused uncertainty is very limited.
- Strong connection between Cyprus and the two countries involved in the war (financial and tourist connections).

- Estimate the size of the Economic Policy Uncertainty (hereafter EPU) shock caused by the war for selected European countries.
- Examine the expected impact of the war-caused EPU shock on output (eg industrial production) for monthly data.
- For the case of a small open economy (Cyprus) examine the effect of war-caused uncertainty on different proxies of output (industrial production, electricity consumption, etc).

Literature Review

- Created by Baker, Bloom, and Davis (hereafter BBD, 2016).
- Answers to questions like:
  - Who will apply economic policy?
  - What kind of economic policy will be followed?
  - What regulations will the policy makers introduce?
  - What will the results of such regulations be for the economy?
- Based on textual analysis and newspaper coverage frequency.

Table 1: Economic Policy Uncertainty construction keywords

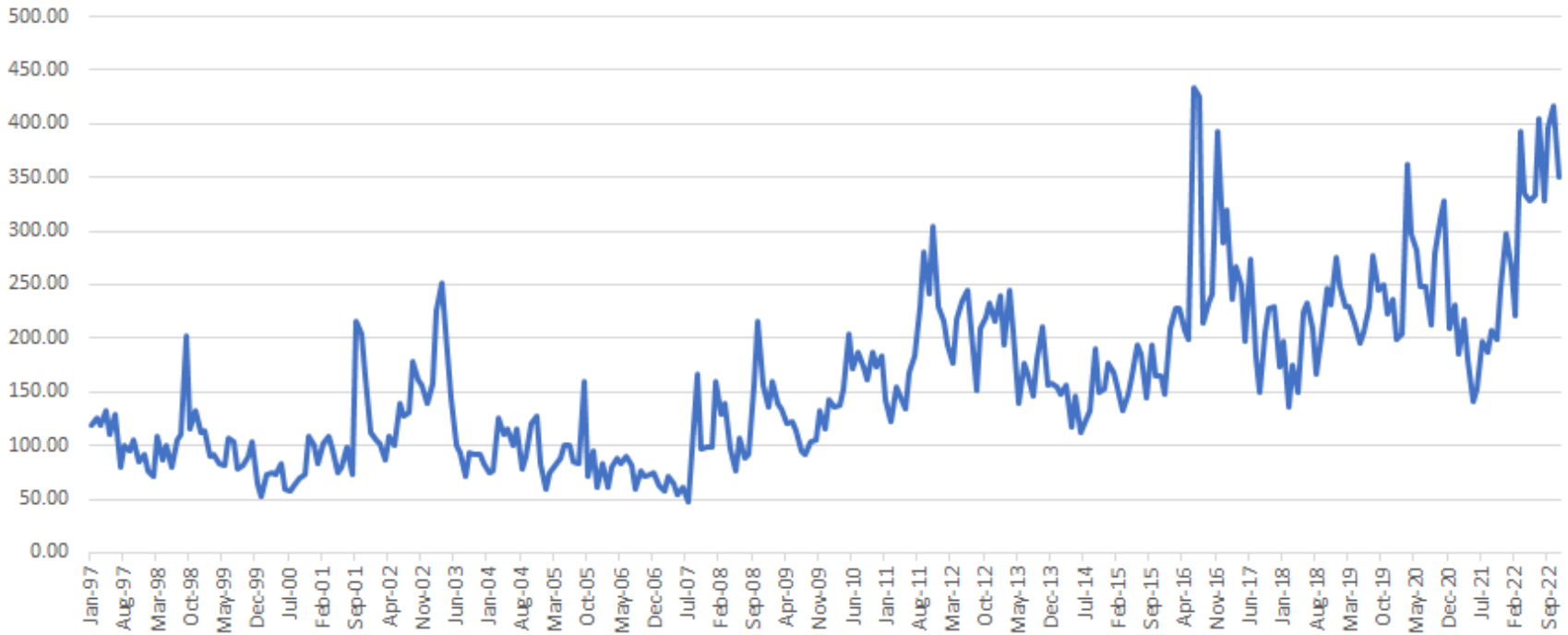
E	economic or economy
P	policy or Congress or deficit or regulation or legislation or Federal Reserve or White House
U	uncertain or uncertainty

Literature Review

Recent studies focusing on the economic implications of the Russia-Ukraine war

- Bobasu and De Santis (2022): Using SVAR models they find that the war has caused economic uncertainty shocks in European countries. These shocks have negative effects on GDP, investment and consumption.
- Bodnár et al. (2022): The authors emphasise the importance of both supply-side and demand-side factors when analysing the impact of geopolitical conflicts on inflation in the Eurozone.
- Diakonova et al. (2023): Prove the negative effects of conflict-related uncertainty shocks on GDP growth in Russia, using several "conflict" indicators (like the geopolitical risk index and the EPU index).
- Shen and Hong (2023): Relationship between global EPU index and geopolitical risk.

The European EPU Index



Data

Monthly data
January 1997 - December 2022

- EPU: policyuncertainty.com
- industrial production: OECD

Coutries:

- France
- Germany
- Greece
- UK
- Sweden
- Cyprus
- Russia

Model

We run a VAR(p) model of the general standard form:

$$y_t = A_0 + A_1 y_{t-1} + ... + A_p y_{t-p} + e_t$$

yt is the vector of the endogenous variables:

- EPU
- industrial production

Sample: January 1997 - December 2019 (exclude the Covid-19 pandemic).

Impulse Responses to an EPU shock equal to the war-caused EPU shock that each country faced.

Estimated in two different ways:

- **EPU shock A**: Difference between the EPU value during January and the month when EPU peaks after the war outbreak.

- **EPU shock B**: Run a VAR model with EPU and industrial production until 2019 and using the estimated coefficients, estimate the extrapolated EPU index until mid 2021.
  The war-caused EPU shock is the difference between the actual and the extrapolated EPU the month after the war outbreak.

Table 2: EPU index descriptive statistics for all examined countries and EPU shock after the outbreak of the war

	Germany	UK	France	Sweden	Russia	Cyprus	Greece
mean	164.5134	197.6923	179.094	95.18267	154.5383	153.1211	123.8597
standard deviation	130.6415	152.1446	108.9861	20.58583	127.3825	66.65281	60.31314
maximum value after the war outbreak	785.0256	311.4735	429.9356	133.6534	702.5749	364.7979	267.6815
EPU peak month after the war outbreak	March	March	March	February	February	April	April
change between peak and January	306.8211	124.7175	116.1475	44.17723	427.3038	139.3948	83.51622
EPU shock A	2.348573	0.81973	1.065709	2.146002	3.354494	2.091357	1.38471
EPU shock B	5.891588	1.594046	1.482133	2.083108		1.839989	1.709146

Impact on industrial production

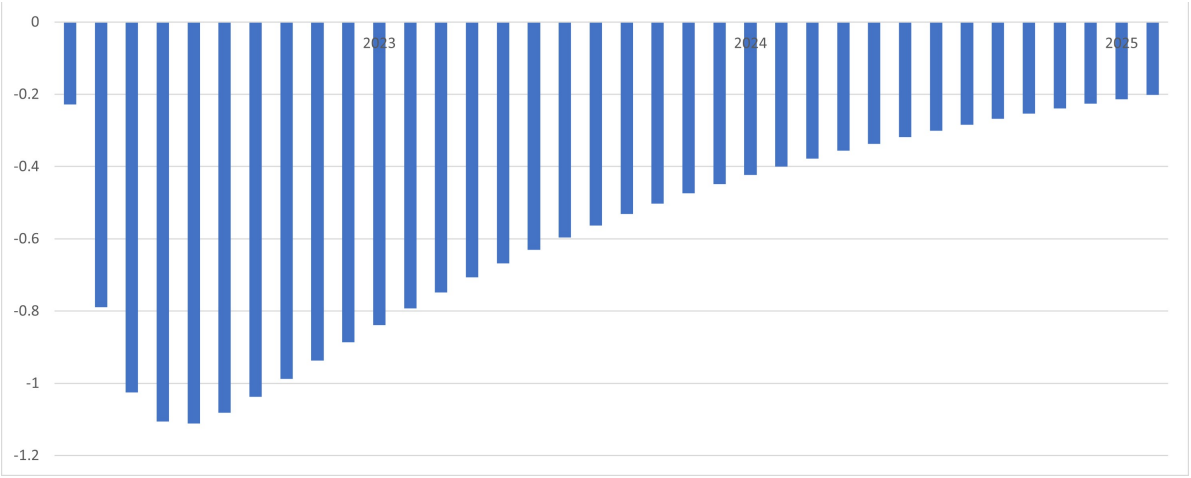


Figure 1: Germany: Impact on industrial production of the war-caused EPU shock

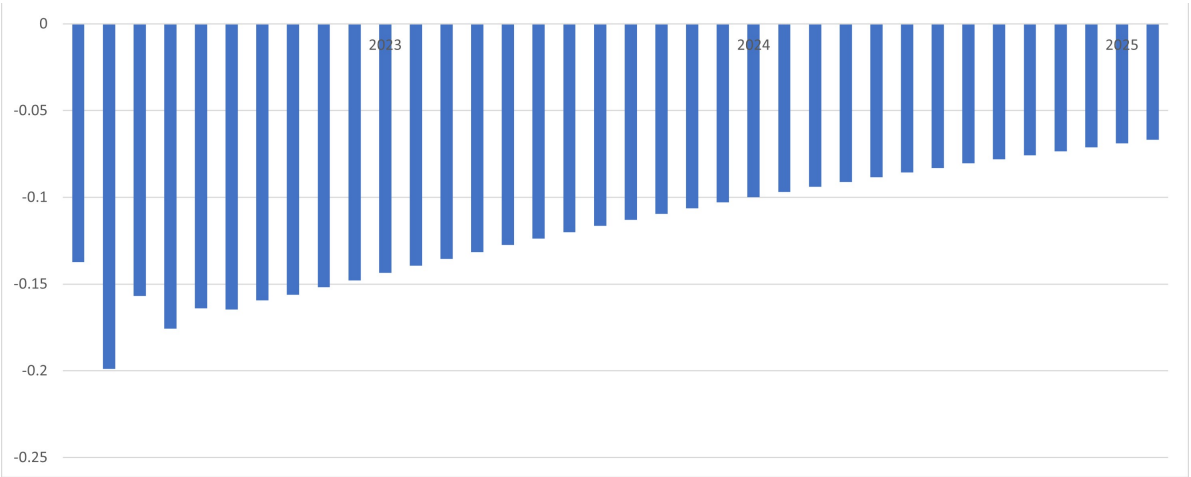


Figure 2: Greece: Impact on industrial production of the war-caused EPU shock

Impact on industrial production

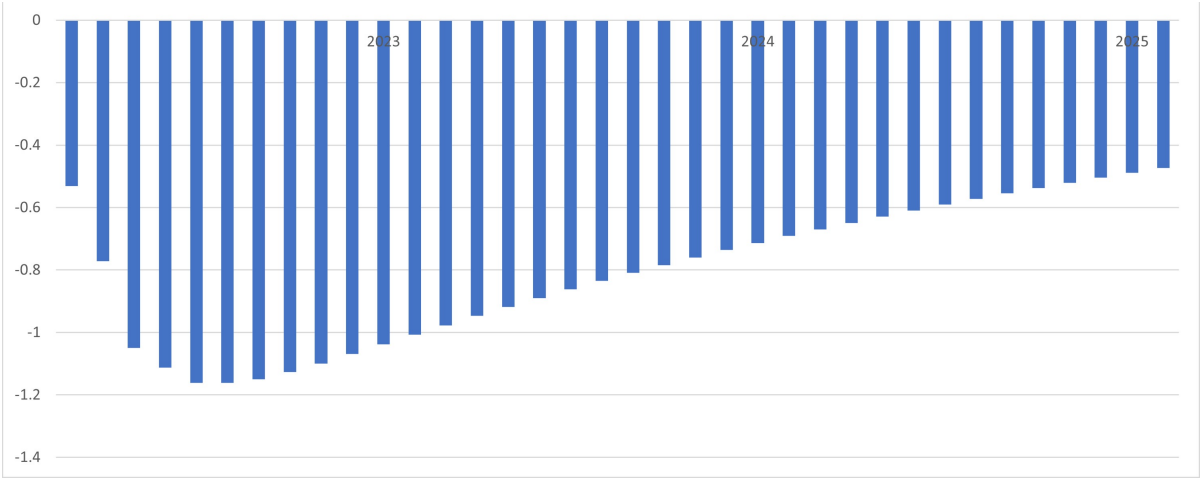


Figure 3: Sweden: Impact on industrial production of the war-caused EPU shock

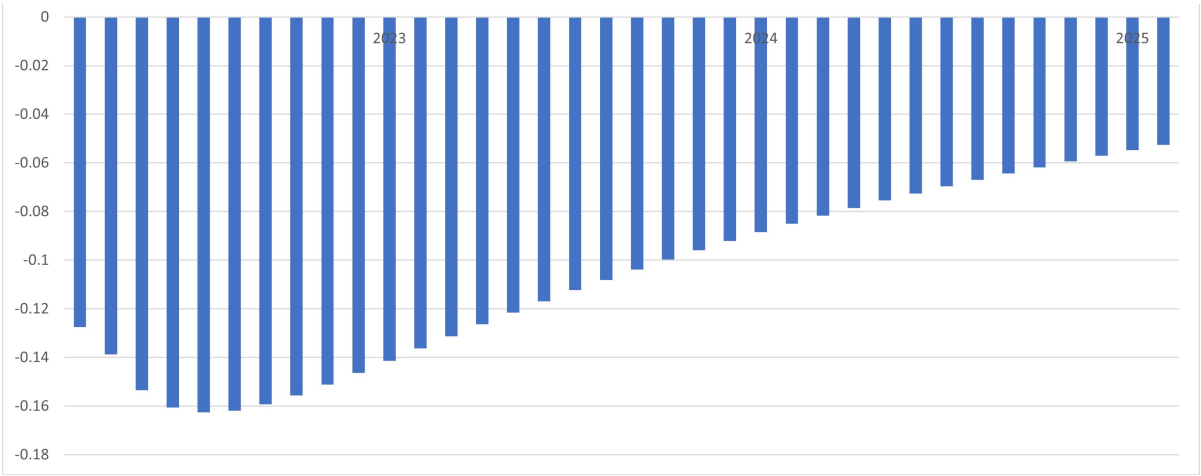


Figure 4: France: Impact on industrial production of the war-caused EPU shock

Impact on industrial production

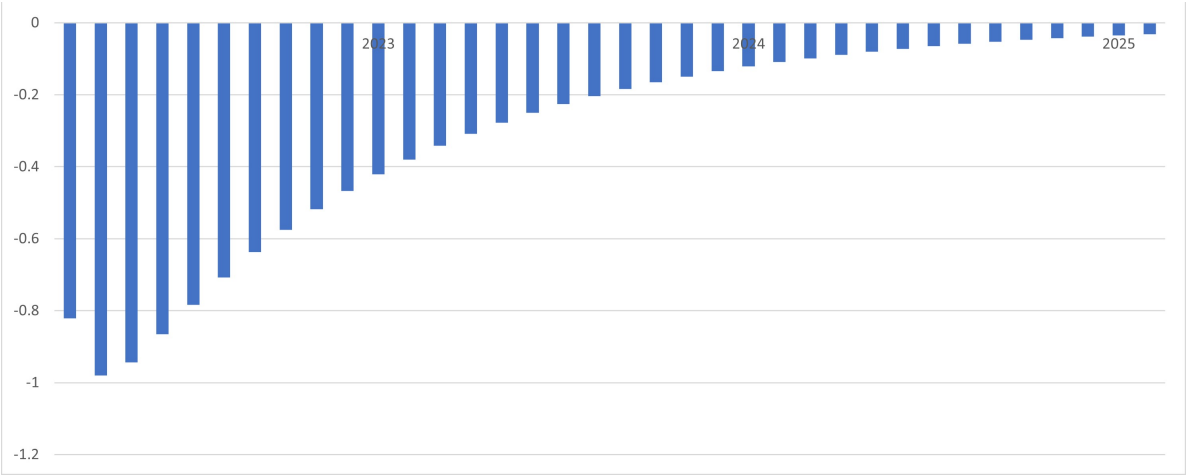


Figure 5: Russia: Impact on industrial production of the war-caused EPU shock

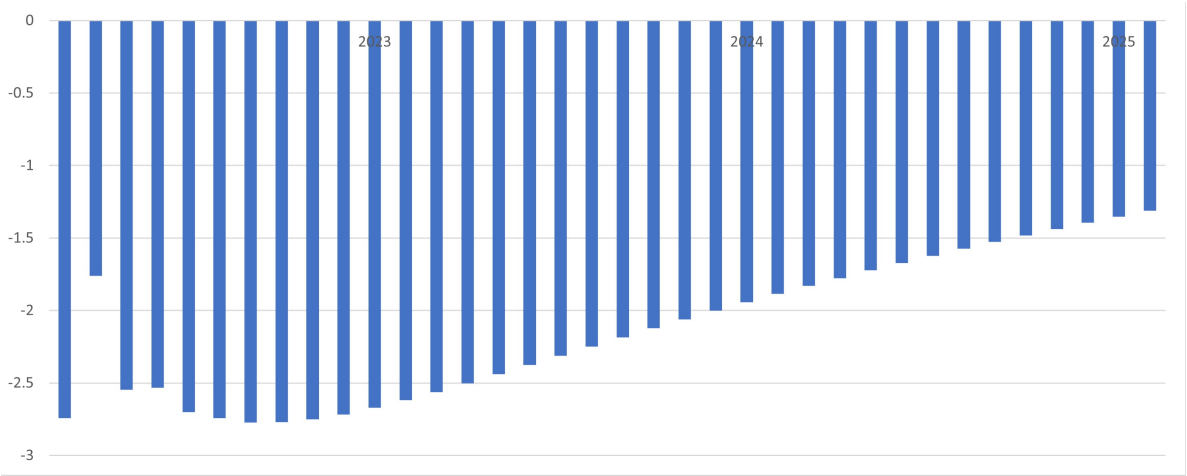


Figure 6: UK: Impact on industrial production of the war-caused EPU shock

Impact on industrial production

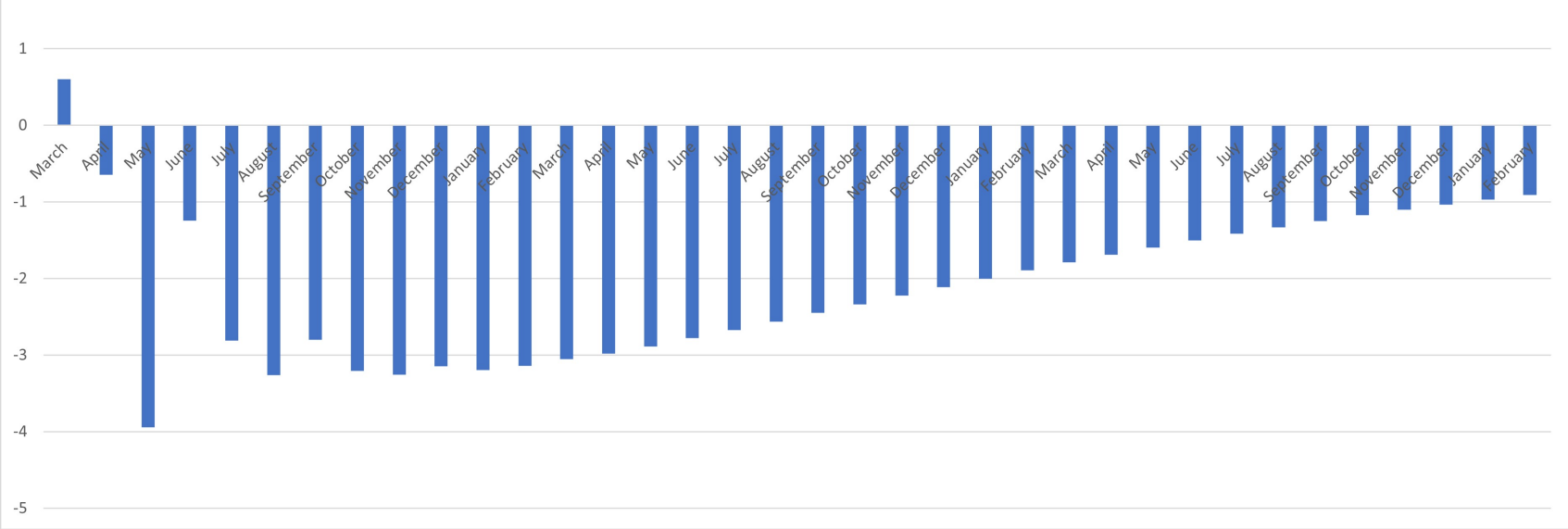


Figure 7: Cyprus: Impact on industrial production of the war-caused EPU shock

Data - Cyprus

Monthly data
January 1997 - December 2022

- EPU: Economics Research Centre
- Industrial Production: OECD
- Electricity Consumption: CyStat
- Retail sales: Eurostat
- Cyprus Composite Coincident Economic Index (CCCEI): Economics Research Centre, UCY

Model

We run a VAR(p) model of the general standard form:

$$y_t = A_0 + A_1 y_{t-1} + ... + A_p y_{t-p} + e_t$$

yt is the vector of the endogenous variables:

- EPU
- output proxy (industrial production or electricity consumption or retail sales or the CCCEI)

Impact on Cyprus' output variables

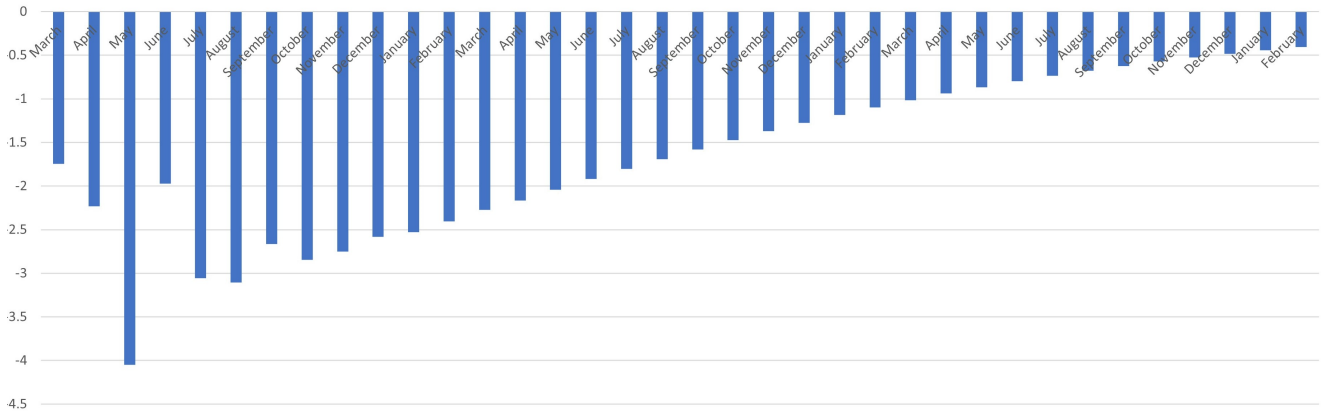


Figure 8: Impact on industrial production of the war-caused EPU shock

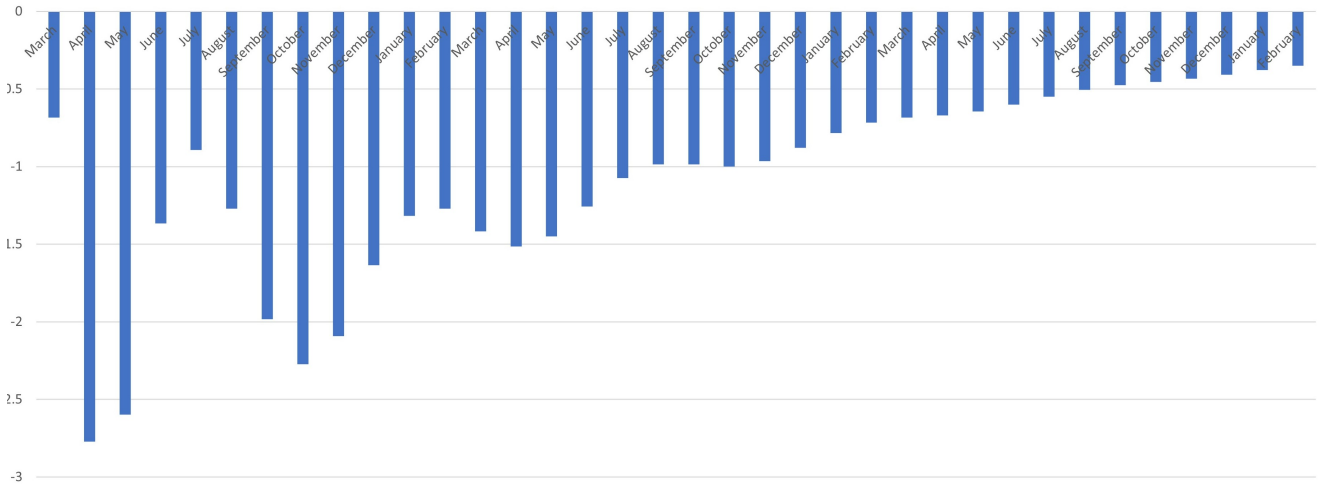


Figure 9: Impact on electricity consumption of the war-caused EPU shock

Impact on Cyprus' output variables

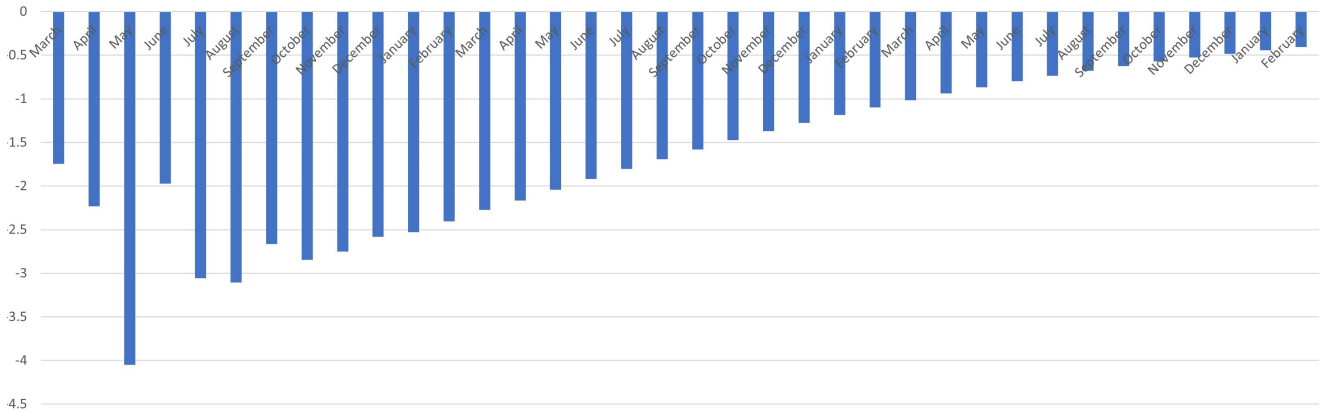


Figure 10: Impact on retail sales of the war-caused EPU shock

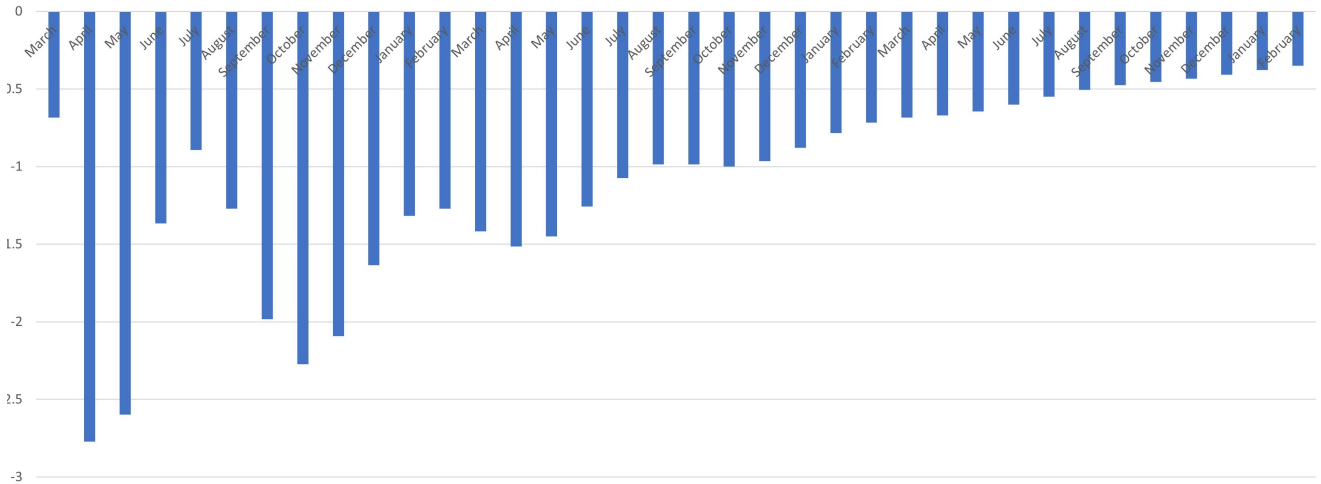


Figure 11: Impact on CCCEI of the war-caused EPU shock

Conclusion

- Each country has been differently affected by the war. Highest EPU shocks for countries with economic connections or geographic proximity (Germany, Cyprus, Sweden).
- The war-caused EPU shock has a negative effect on the output of European countries.
- Different output proxies for the small open economy of Cyprus respond with a different size and duration to the war-caused EPU shock, but in all cases the impact is negative.

Ideas for Future Research

- Add more variables and run the same analysis in a multivariate VAR framework.
- Use geopolitical risk index instead of the EPU index and compare the implications of war-caused shocks on the two indicators.

Thank you for your attention.