



ΤΡΑΠΕΖΑ ΤΗΣ ΕΛΛΑΔΟΣ
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Geopolitics, uncertainty and inflation shocks in Greece: domestic versus global shocks

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Outline



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- 3** Inflation and global geopolitical shocks
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- 5** Econometric analysis: the model
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Purpose and key questions

The purpose is threefold:

- to track the driving forces of Greek headline inflation over the past 50 years;
- to trace how uncertainty emanating from both global geopolitical shocks and country-specific shocks have affected inflation;
- to present an evidenced-based perspective of how the typology of shocks, either demand- or supply-driven shocks, affects Greek headline inflation.

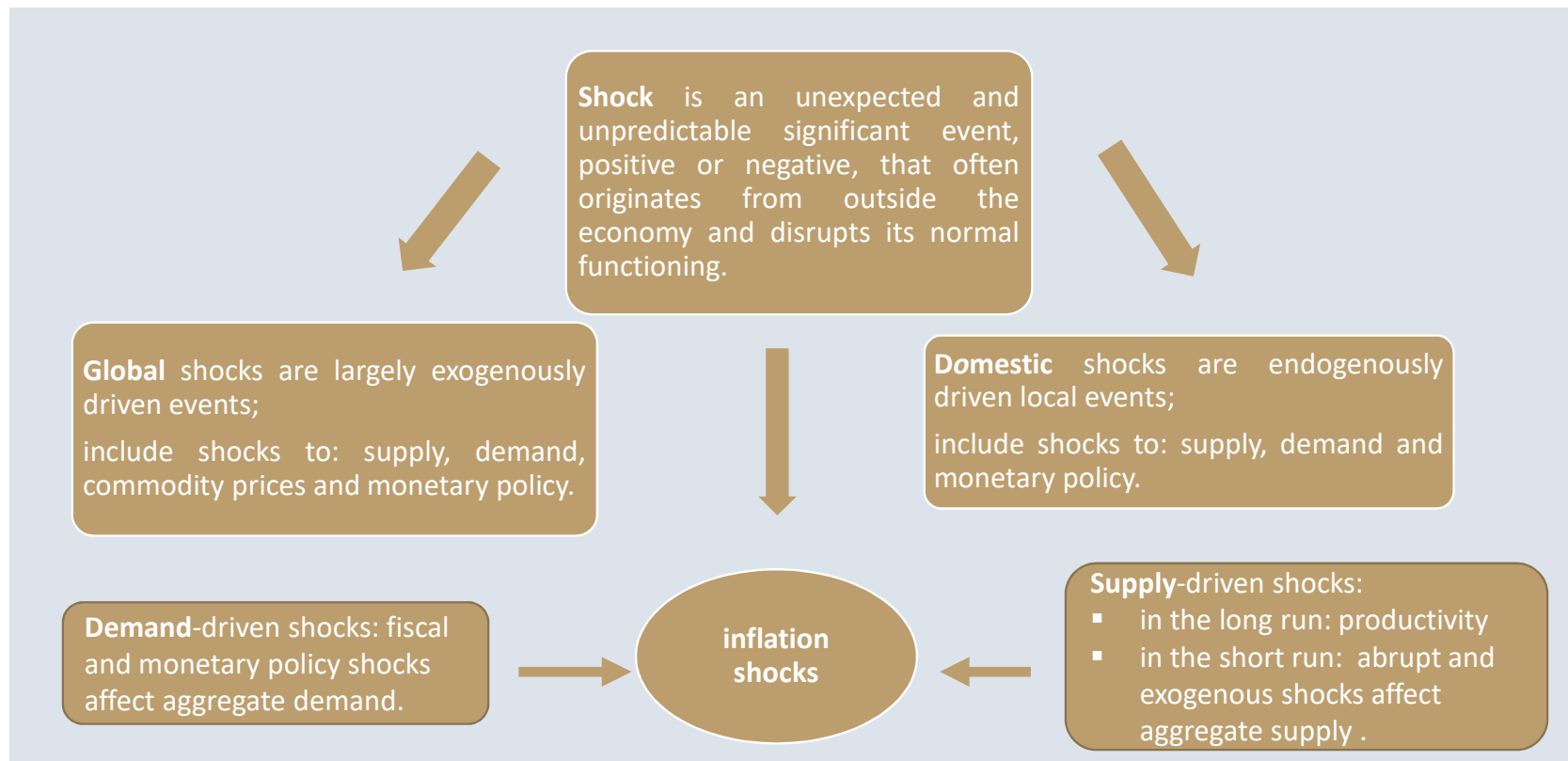
Key questions

- What is a shock?
 - global *versus* domestic shocks;
 - demand *versus* supply shocks
- How global and domestic shocks affect inflation?
- How demand and supply shocks affect inflation?

What is a shock?



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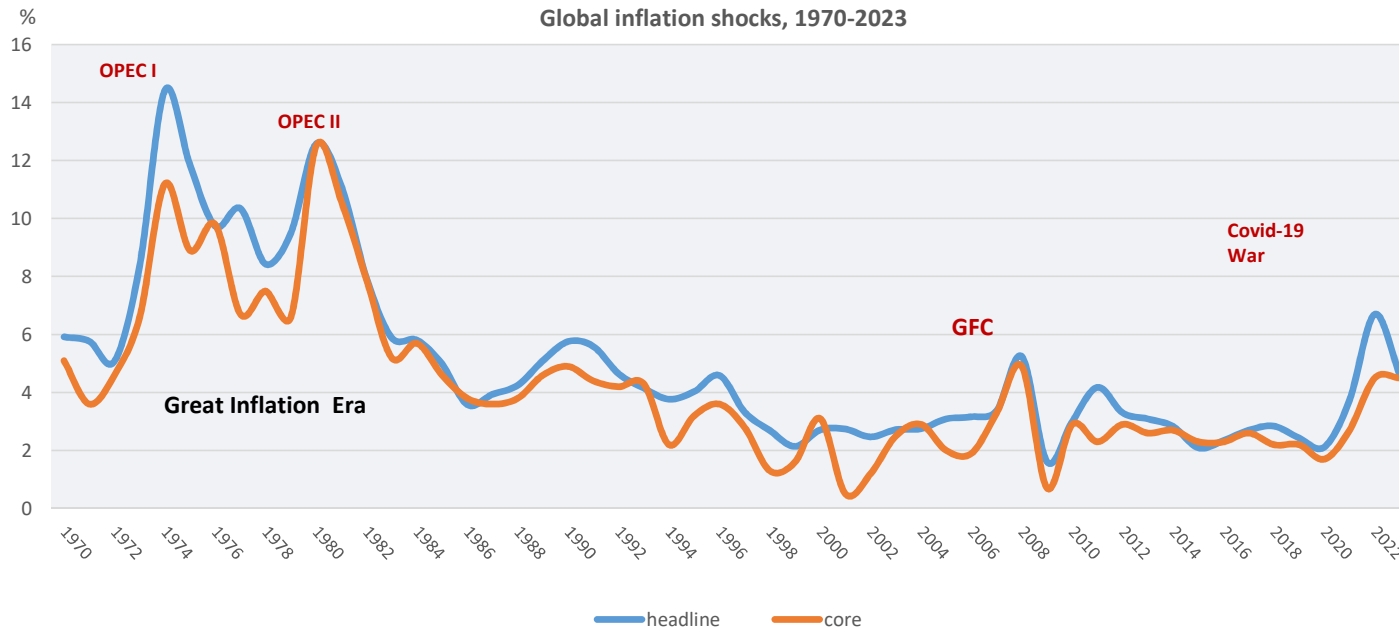




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Global shocks and global inflation

Figure 1
Global inflation shocks, 1970-2023



Global shocks:

- have played a prominent role in explaining variation in global inflation
- encompass
 - demand shocks (e.g. GFC and the inflation surge after lockdowns);
 - supply shocks (e.g. OPEC I and OPEC II, COVID-19 and war).

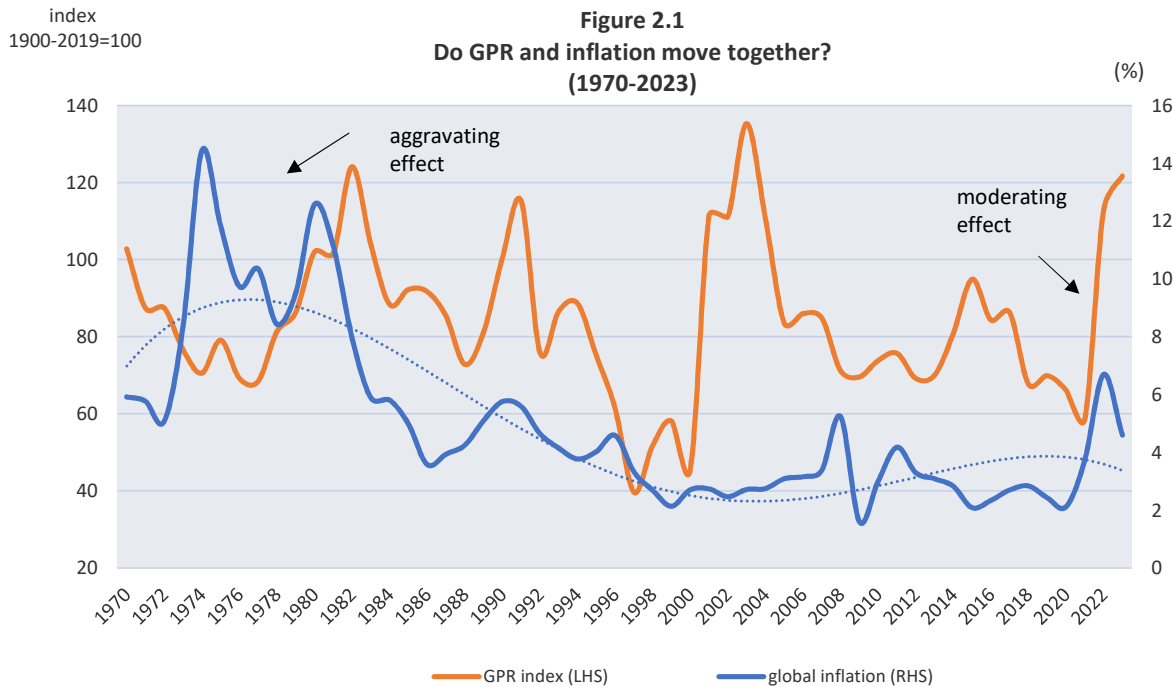
Source: Ha *et al.* (2023), April 2024 update.

Note: headline (HCPI) and core global inflation rate, GDP-weighted average, annual averages.



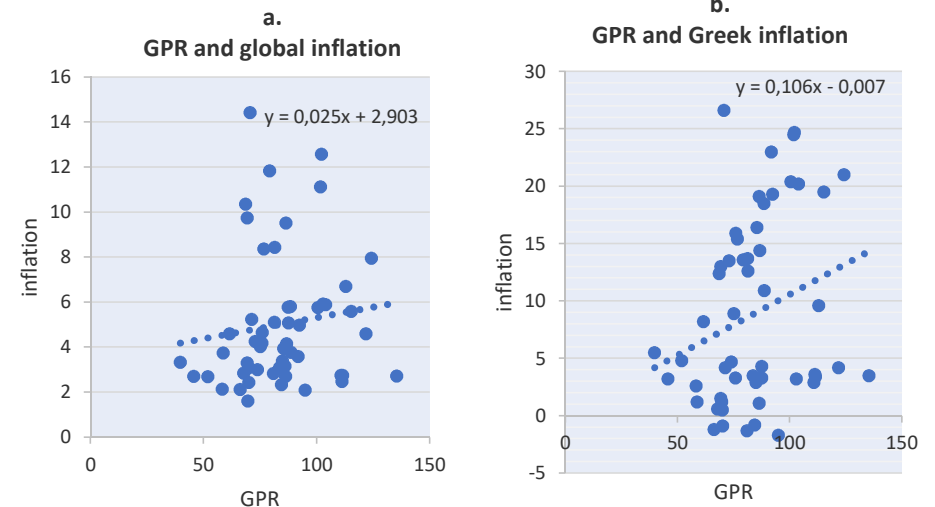
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How global geopolitical shocks affect inflation? A prime example of global supply shocks



Sources: Ha *et al.* (2023), April 2024 update; Caldara and Iacoviello (2022), <https://www.matteoiacoviello.com/gpr.htm>
Notes: headline (HCPI) inflation; GPR= global geopolitical index.

Figure 2.2
Is there a positive correlation?



- Global geopolitical shocks are often negative supply shocks and important drivers of cost push inflation.
- Geopolitics is the common thread underlying all major inflation shocks.
- Monetary policy shocks as positive demand shocks by accommodating a negative supply shock, turn cost push inflation to demand pull inflation.

Greek inflation snapshot

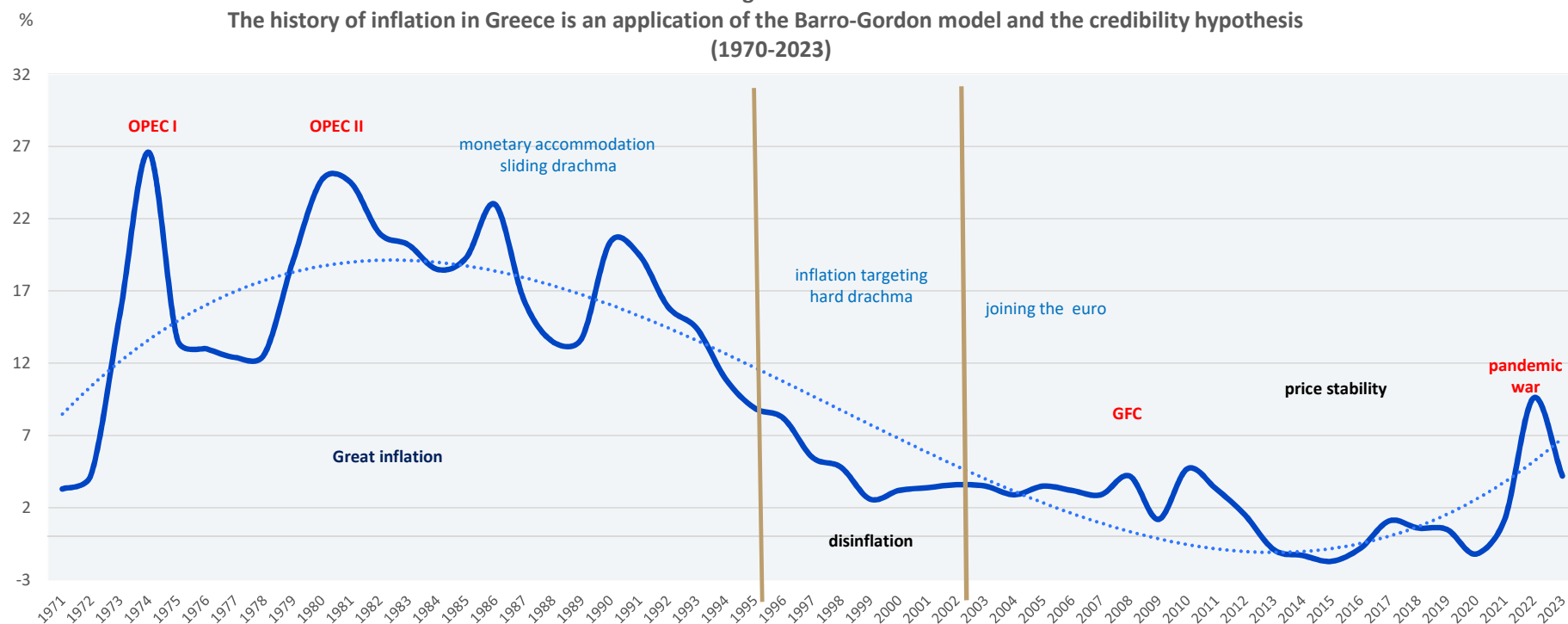
Both global and domestic shocks explain variation in Greek inflation



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Figure 3

The history of inflation in Greece is an application of the Barro-Gordon model and the credibility hypothesis
(1970-2023)



Source: Ha et al. (2023), April 2024 update.

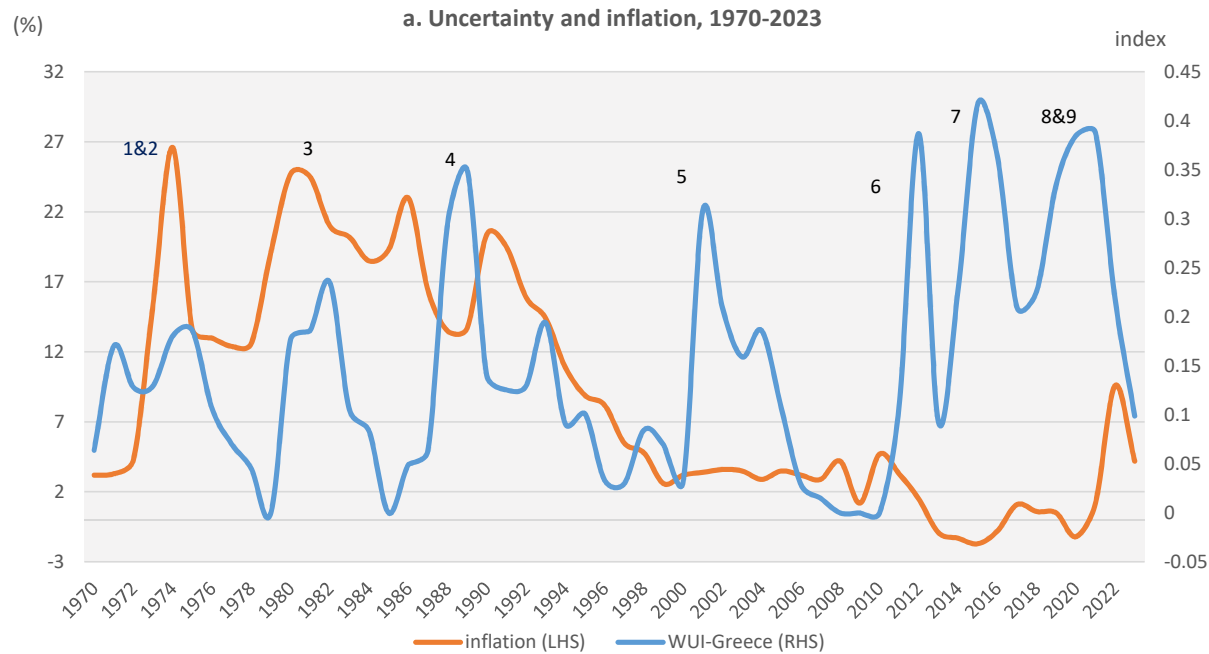
Note: headline (HCPI) inflation.



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Uncertainty and Greek inflation

Figure 4
How domestic shocks drive inflation in Greece?

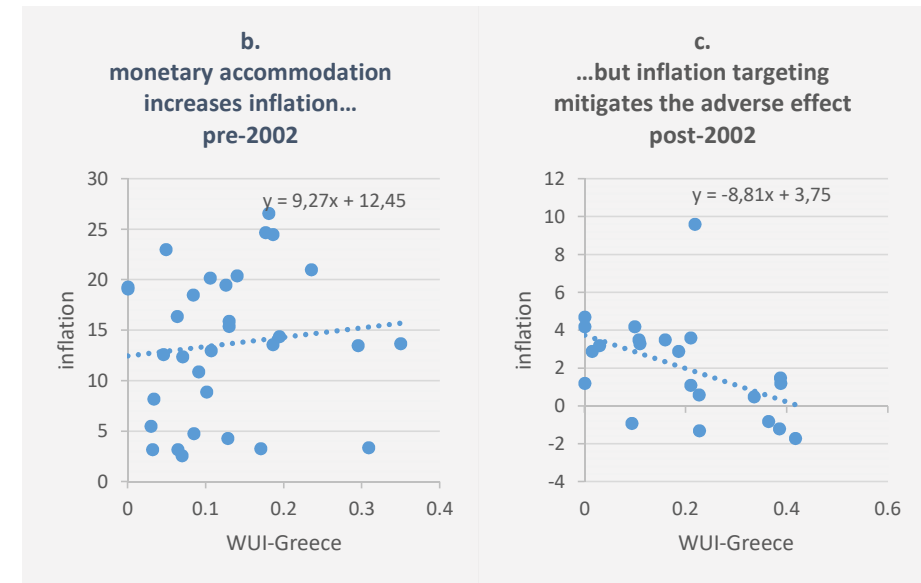


Sources: HCPI Greece: Ha *et al.* (2023), April 2024 update; WUI-Greece: Ahir *et al.* (2022), April 2024, update.

Notes: headline inflation. Major local political and economic events are depicted.

1&2: 1973 Turkey invades Cyprus, 1974 Athens Polytechnic uprising; 3: 1981 political change; 4: 1989 inconclusive elections, threat of a sovereign default; 5: 2000-01 Greek stock exchange bubble; 6: 2012 economic and political uncertainty related to sovereign debt sustainability and bank solvency and Grexit; 7: 2015 uncertainty related to Greece's euro area membership; 8&9: 2020 Covid-19, 2022 war in Europe.

WUI-Greece index has been computed by counting the frequency of the word uncertainty or its variant in Economist Intelligence Unit country reports. The index is normalized by total number of words and rescaled by multiplying by 1000. A higher number means higher uncertainty, and vice versa.





Econometric analysis: the model

We assess the impact of uncertainty on inflation and real output, by means of a structural modification of a Bayesian vector autoregressive (VAR) model

- General specification with a total of four lags (p):

$$Y_t = A_0 + \sum_{i=1}^p A_i Y_{t-i} + B_j X_t + e_t \quad (1)$$

- Quarterly Greek data from 2000Q1-2024Q2
- The selection of endogenous variables has been carried out in accordance with the empirical literature (Caldara *et al.* 2020 and 2024; Ahir *et al.* 2022):

$$Y_t = (cop_t, \pi_t, y_t, r_t)$$

where

cop_t denotes the annualised growth rate of the Brent oil price

π_t denotes the quarterly average of HICP inflation (y-o-y)

y_t is the annualised quarterly real growth rate of the Greek economy, and

r_t is the quarterly average of the 3-month Euribor.



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Econometric analysis: the model (continued)

- The Matrices A_i and B_j
denote the estimated coefficients: Minnesota prior (Litterman 1986) as the assumed prior distribution. Prior selection criteria based on the grid search that employs the proposed criterion of Giannone *et al.* (2015).
- The Vector X_t represents the exogenous variables:
 - ✓ the World Uncertainty Index for Greece (WUI-Greece)
 - ✓ the Global Geopolitical Risk (GPR) Index.
- The incorporation of these variables into the model and their treatment as exogenous influences is aimed at better addressing inflation dynamics in the context of uncertainty stemming from both global and unanticipated country-specific events.



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Econometric analysis: Explicit features of our model

- To determine the extent to which supply- and/or demand-driven inflation shocks have important implications for inflation, a sign restrictions identification scheme is employed.
- This is pursued by means of a sign restrictions version of the Bayesian VAR, following similar identification strategies proposed by Faust (1998), Canova and De Nicrolo (2002), Uhlig (2005), and Baumeister and Hamilton (2015).
- Considering the prevailing context of monetary policy tightening in the euro area, it is further assumed that a reactive monetary policy is in place, whereby interest rates increase in response to both types of shock.



Sign restrictions

- A demand-driven shock is defined as a shift in both prices and real output (i.e. quantities) in the same direction along an upward-sloping aggregate supply curve,
- A supply-driven shock is defined as a shift in prices and real output in opposite directions along a downward-sloping aggregate demand curve:

Assumed sign restrictions for demand and supply shocks

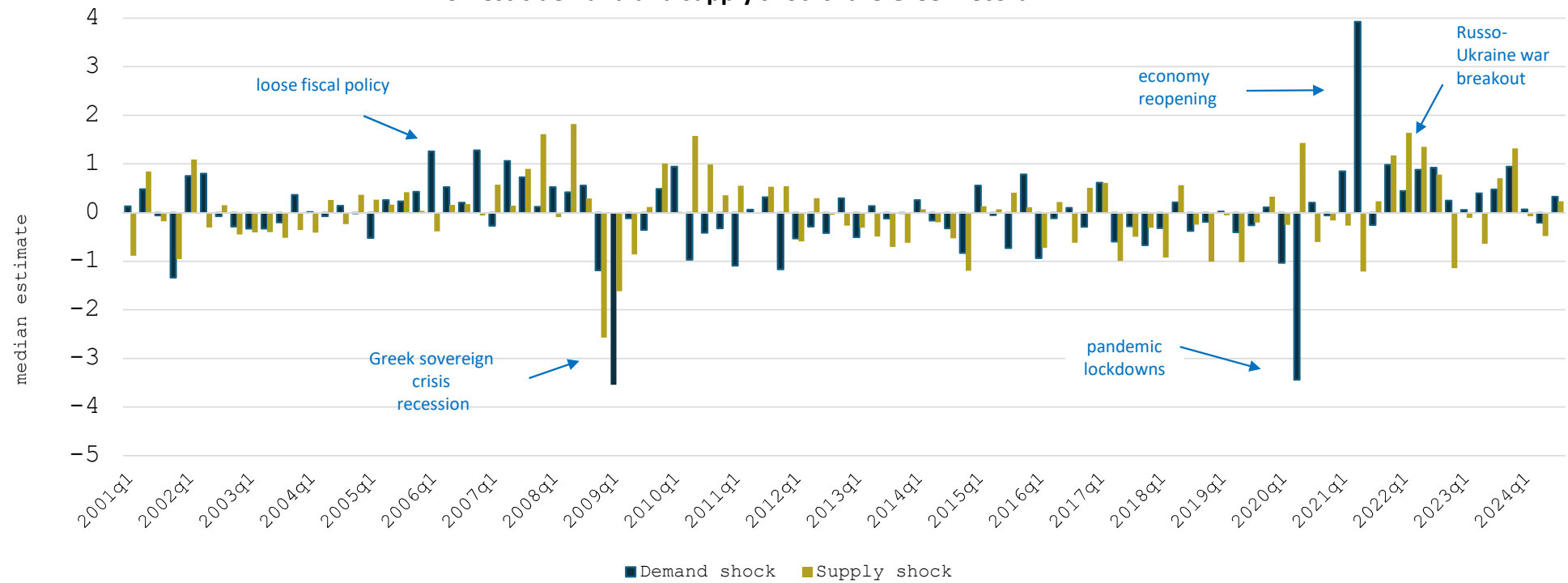
Variable/shock	Supply-side shock (cop_t)	Demand-side shock (π_t)
π_t	+	+
r_t	+	+
y_t	–	+

Note: By definition, the variance-covariance matrix in a structural VAR context is known a priori with respect to the assumed signs, either positive or negative. No assumptions are made about the size of the shocks.



Evidenced-based typology of domestic shocks

Figure 5
Domestic demand and supply shocks: the Greek record



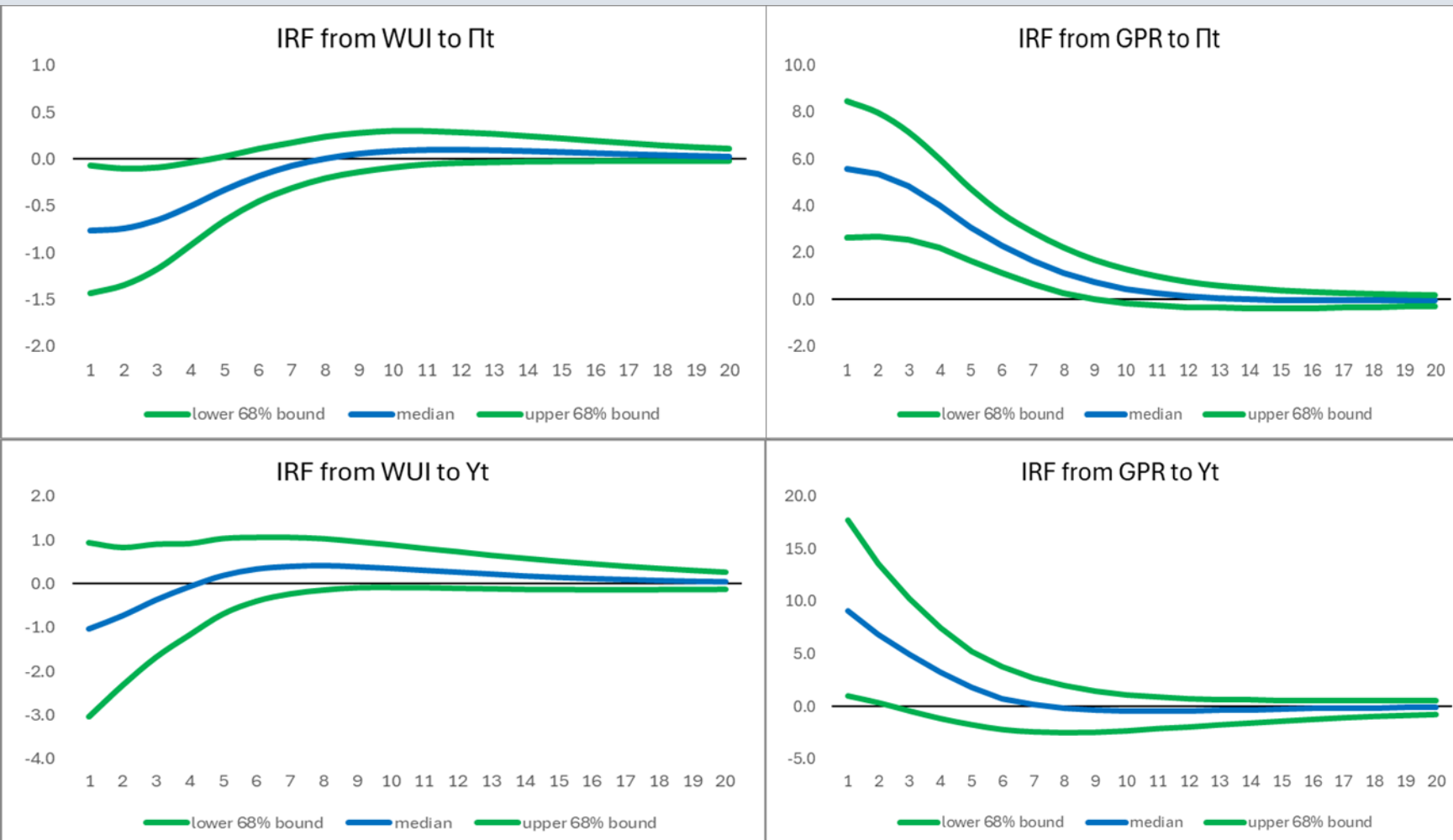
Source: Authors' estimations, derived from the sign restrictions identification scheme of the employed VAR model.

Note: the sample period starts in 2001 due to the data availability for the control variables in the estimated model.



Empirical findings

Impulse response functions (IRF) in the context of uncertainty arising from country-specific and global geopolitical events to headline inflation (π_t) and real output growth rate (y_t)



Source: Authors' estimations.

Notes: IRF=impulse response function. Country-specific events are captured by WUI-Greece (left-hand panels).

Global events are captured by the GPR index (right-hand panels).

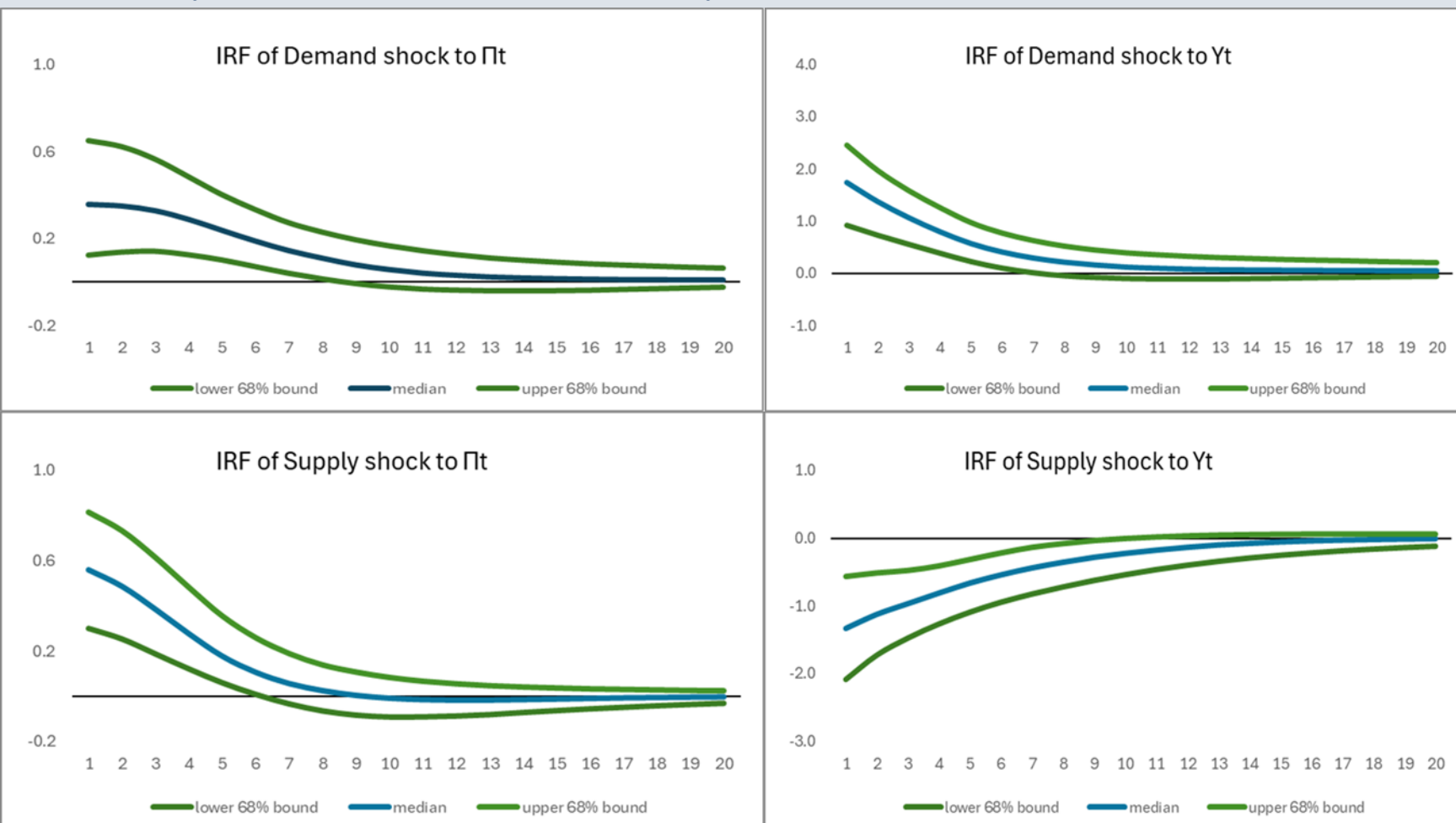
The size of the shock is equal to one standard deviation of the exogenous error process.



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Empirical findings

Impulse response functions from a domestic demand and a supply shock to headline inflation (π_t) and real output growth rate (y_t)



Source: Authors' estimations.

Note: The size of the shocks is equal to one standard deviation of the exogenous error process

Conclusions

Our paper analyses the underlying forces that have driven inflation in Greece, which in turn entails an examination of both domestic demand and supply shocks, as well as global supply shocks.

We find that:

- there is a direct interplay between domestic demand shocks, domestic supply shocks, global supply shocks relating to geopolitical risk, and Greek headline inflation;
- the uncertainty arising from both country-specific shocks and global geopolitical shocks exerts a substantial influence on domestic headline inflation;
- in the presence of a global geopolitical shock, the impact is more enduring and substantial;
- domestic demand shocks imply more persistent inflationary pressures compared to those produced by domestic supply shocks.
- regarding the impact on the real output growth, the estimated impulse responses validate the assumed sign restrictions.

Thank you!



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