



27th Annual DNB Research Conference

The Macroeconomic Effects of Geopolitical Uncertainty

De Nederlandsche Bank

EUROSYSTEM

Do Geopolitical Risks Raise or Lower Inflation?

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Federal Reserve Board

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Geopolitical Events and Inflation

Adverse geopolitical events often associated with inflation through a variety of channels (public spending, money creation, inefficient use of resources)

Argentines See Jump In Inflation

By JAMES M. MARKHAM Special to The New York Times (1923-); May 12, 1982; pg. D1

Argentines See Jump In Inflation

War Strains, Spending Cited

By JAMES M. MARKHAM

But the consensus in Argentina's business community is that the financial strains and dislocations that the conflict in the South Atlantic have caused — combined with a wave of spending by the military — have guaranteed that inflation will soar in the months ahead, and that a free-market, belt-tightening experiment under Economics Minister Roberto Alemann is just about over.

Well-placed bankers and economists

VAST INFLATION ERUPTS FROM CHINA'S LONG WAR

By TILLMAN DURDIN Special to THE NEW YORK TIMES. New York Times (1923-); Feb 16, 1947; ProQuest Historical Newspapers; pg. E4

VAST INFLATION ERUPTS FROM CHINA'S LONG WARS

End of Mediation Effort and Lack of U. S. Credits Contribute to the Crisis

By TILLMAN DURDIN
Special to THE NEW YORK TIMES.

A major element in the present state of affairs is the long-standing unsatisfactory fiscal position of the Central Government. Throughout eight years of the Japanese war, the Government met most of its domestic expenditures by issuing steadily increasing amounts of paper currency. Revenues during these Japanese war years never amounted to more than 30 per cent of disbursements; thus the new notes consistently represented 70 per cent of heavy war-time costs.

Internal Strife a Factor

By NEIL SHEEHAN Special to The New York Times. New York Times (1923-); Nov 5, 1965; ProQuest Historical News pg. 3

INFLATION A PERIL IN SOUTH VIETNAM

U.S. Helps Saigon Wage War on Economic Front

By NEIL SHEEHAN
Special to The New York Times

With much of its transportation system wrecked by war or severed by guerrillas and most of the rice-producing Mekong delta, the economic heartland of the country, in Communist hands, South Vietnam is being squeezed in the vise of a burgeoning money supply but a shrinking market of goods, services and facilities.

WAR BOOM HAS ITS DARK SIDE, BANKERS WARN
Forester, Leland
Chicago Daily Tribune (1923-1963); Oct 1, 1939; ProQuest Historical News pg. B7

WAR BOOM HAS ITS DARK SIDE, BANKERS WARN

Fear Vast Inflation in Long Conflict.

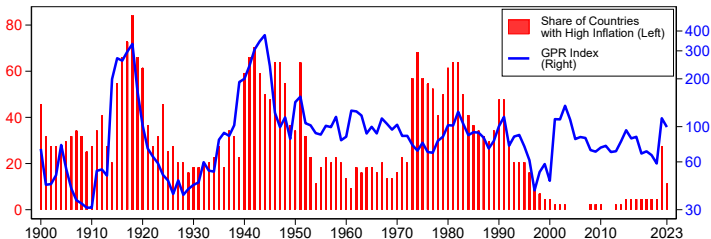
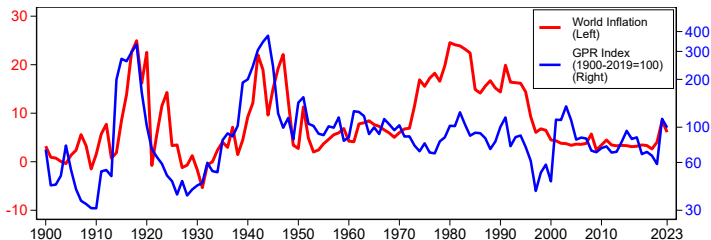
BY LELAND FORRESTER.

Other bankers, speaking at the meeting, said that unwise laws impair the efficiency of industry at a time when the nation should be using every economic means to make itself secure. They termed the government's cheap money policy a failure and said interest rates now are heading upward.

Introduction

- What is the relationship between adverse geopolitical events (GPR) and inflation?
- Ambiguous from a theoretical standpoint:
 - ▶ Adverse supply effects ($\pi \uparrow$)
 - ▶ Monetary & fiscal policy ($\pi \uparrow$)
 - ▶ Adverse demand effects, uncertainty ($\pi \downarrow$)
- We use 120 years of data and various empirical techniques to examine the historical association between higher GPR and inflation.

Main Finding: Geopolitical Risks Raise Inflation



Global Inflation is a GDP-weighted aggregate of inflation in 44 countries. Geopolitical Risk is indexed to 100 in the 1900-2019 period. Inflation winsorized at 97.5 percentile in each country.

Macroeconomic Data

1. Country-Level Historical Annual Data:

- ▶ **Coverage:** 1900 through 2021, 44 countries (17 AEs).
- ▶ **Inflation** (IMF, Jordà et al., Reinhart-Rogoff, other sources).
- ▶ **Real GDP** (WDI, PWT, Barro-Ursua).
- ▶ **Policy Indicators:** Military and public expenditures, public debt, money growth, trade openness (Various sources)
- ▶ **Text Data:** News-based index of shortages

2. Global Time-Series Monthly Data:

- ▶ **Coverage:** 1974 through 2023.
- ▶ **Macro variables:** world GDP, world inflation, consumer confidence
- ▶ **Financial variables:** stock prices, dollar exchange rate, oil prices, commodity prices index.

Geopolitical Risk

- **Geopolitical Risk** is the threat, realization, and escalation of adverse events associated with wars, terrorism, and any tensions among states and political actors that affect the peaceful course of international relations.
- The GPR index is a continuous measure of risk. Higher values measure:
 - ▶ higher current intensity of negative events (e.g. more wars)
 - ▶ higher probability of negative events in the future
 - ▶ higher expected intensity of future negative events

Measurement: Newspaper Searches

- The geopolitical risk (GPR) index is measured by the **frequency** of newspaper articles discussing adverse geopolitical events.

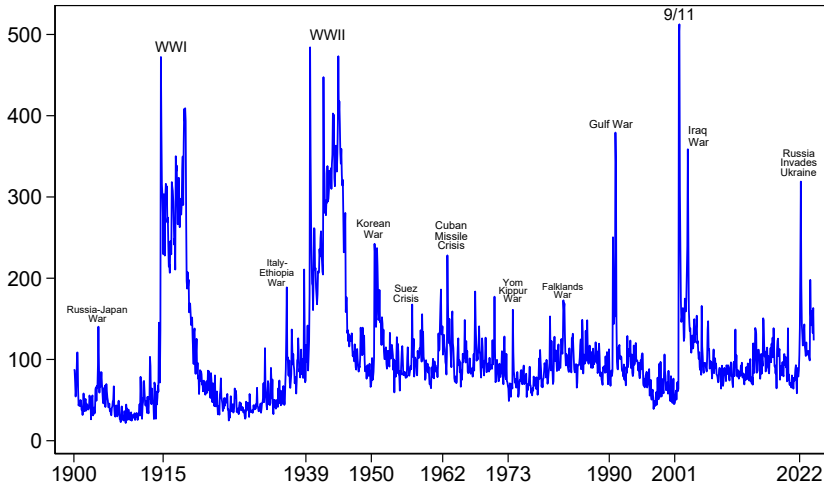
$$GPR \propto \frac{\mathcal{G}}{\mathcal{U}}$$

\mathcal{G} : number of articles mentioning adverse geopolitical events

\mathcal{U} : total number of articles

- An article mentioning geopolitical risks must contain:
 - ▶ “topic” words (e.g. war words, nuclear words, terrorism words)
 - ▶ “threat” or “act” words for each topic
- **Historical indexes since 1900**: NYT, Chicago Tribune, and WaPo

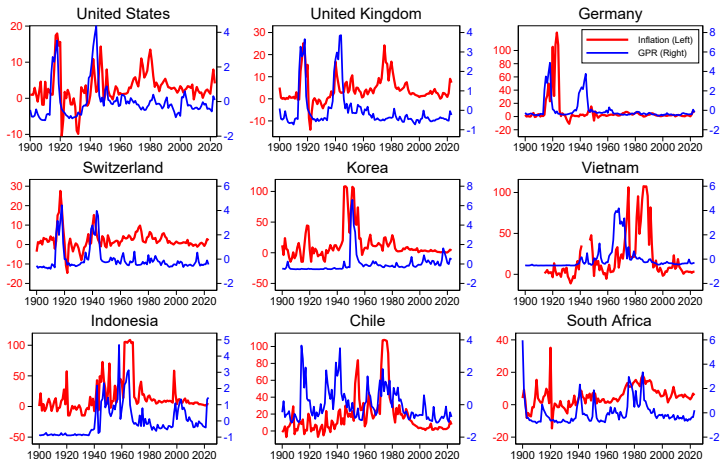
The Geopolitical Risk Index over time



*Historical Index 1900-1984, Recent Index from 1985 on. Historical Index rebased to match mean of recent index between 1985 and 2019.

Country-Specific GPR & Inflation

- GPR-related articles also mentioning specific country.
- High country-GPR correlated with higher inflation at the country level.

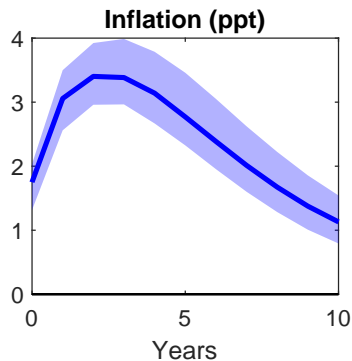
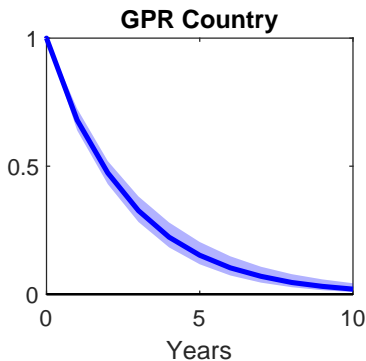


Annual Country-Specific Geopolitical Risk (Standardized) and Annual Inflation. Last observation is 2022. Inflation winsorized at 97.5 percentile.

Bivariate Panel VAR: GPR and Inflation

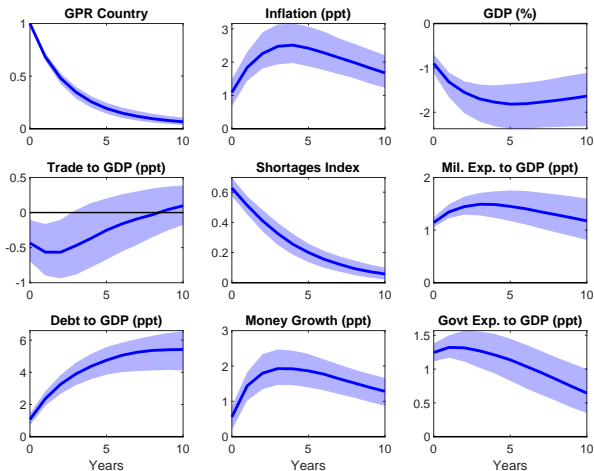
- Annual, 1900-2022, 43 countries (exclude U.S.)
- Start with two-variable model to maximize number of observations
- Cholesky with country-GPR indexes ordered first

Result: Increases in GPR raise inflation



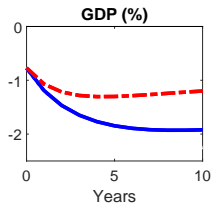
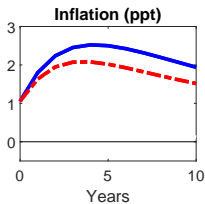
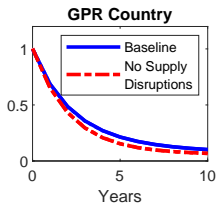
Nine-variable Panel VAR: Inspecting Transmission

- Following increase in country-specific GPR...
- ... Decline in international trade, supply disruptions
- ... Public spending, debt and money supply increase



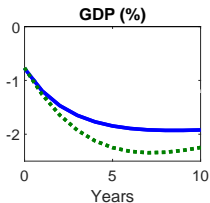
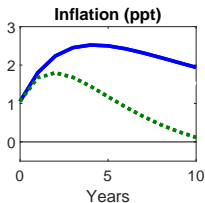
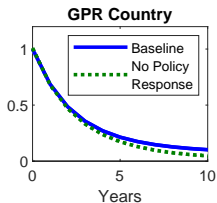
Why Does Inflation Rise? Two counterfactuals (1)

- Absent supply disruptions (hold shortages, trade fixed)
→ smaller inflation rise, smaller GDP drop.



Why Does Inflation Rise? Two counterfactuals (2)

- Absent policy response (hold public spending, public debt, money supply fixed)
→ smaller inflation rise, larger GDP drop.



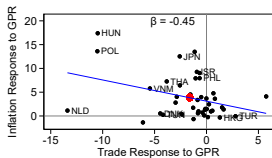
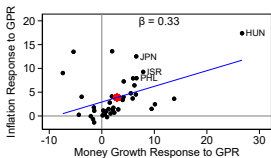
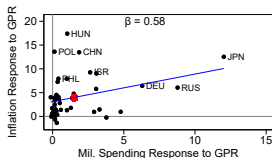
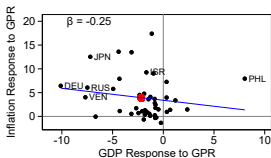
Allowing for Country Heterogeneity?

Predictive regressions allowing for heterogeneous country responses.

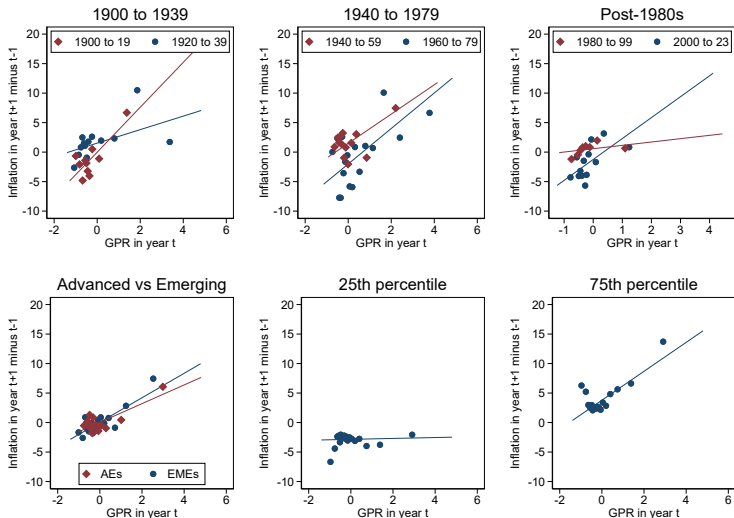
$$\Delta X_{i,t+3} = \alpha_i + \beta_i \text{GPRC}_{i,t} + u_{i,t}$$

where X_t : π , GDP, Mil./GDP, Money Growth, Trade/GDP.

- Response of π varies across countries: mostly positive.
- Response of π lines up in the cross-section with responses of GDP(-), mil. spending (+), money (+), trade (-).



Subsample Analysis and Inflation Risk

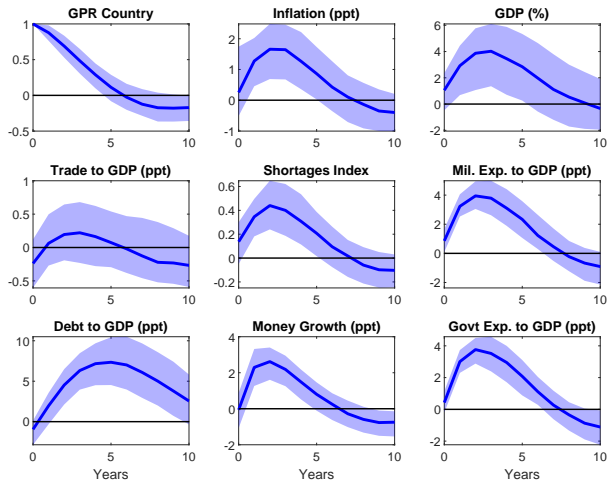


US VAR: Validating transmission

Why is instructive to zoom into the US?

1. U.S. unique experience in geopolitical events:
 - ▶ Involvement in many major conflicts
 - ▶ No conflict happening on U.S. soil (except 9/11).
2. Interplay of GPR with military news data (Ramey)

US VAR: Validating transmission



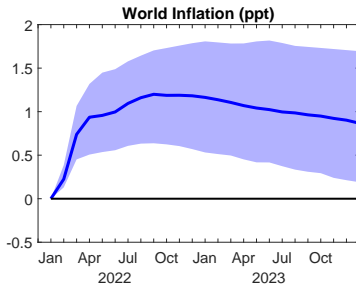
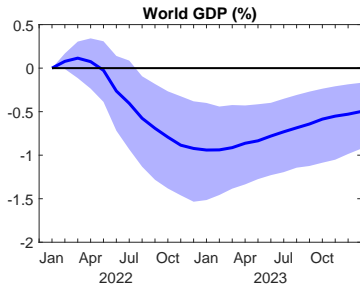
Global Effects of GPR since 1970s

Application to the Russian Invasion of Ukraine

- Global monthly VAR from 1970s:
 - ▶ Examine role of **global** factors (dollar, comm prices)
 - ▶ **Monthly** frequency required to trace effects on fast-moving variables.
- Estimation uses GP Acts and GP Threats indexes:
 - ▶ **GPA** capture realization of adverse geopolitical events.
 - ▶ **GPT** capture higher threat of future adverse geopolitical events.
- Russia-Ukraine War Scenario:
 1. Extract historical GPT and GPA shocks.
 2. Construct simulation that tracks the dynamic effects of GPR shocks between Jan and Apr 2022.

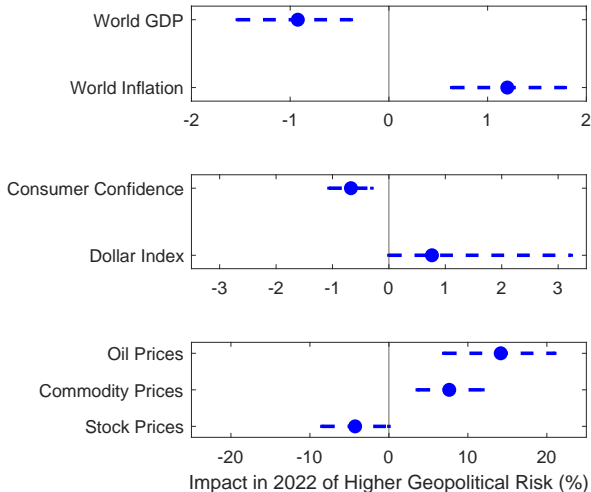
Russia-Ukraine War Scenario: Global Effects

GPA & GPT Shocks Observed between Jan and Apr '22



Russia-Ukraine War Scenario: Transmission

GPA & GPT Shocks Observed between Jan and Apr '22



Conclusions

- Geopolitical risks raises inflation.
- Panel regressions since 1900: GPR predicts higher inflation through adverse supply-side effects and expansionary policies.
 - ▶ Effects vary over time and across countries.
- Global monthly VAR since 1974: GPR predicts higher inflation through higher commodity prices and dollar appreciation.
 - ▶ Russian invasion of Ukraine estimated to increase global inflation of nearly 1.5 ppt.

APPENDIX

Measurement: Selecting Terms in set \mathcal{G}

- An article mentioning geopolitical risks must contain:
 - ▶ “topic” words (e.g. war words, nuclear words, terrorism words)
 - ▶ “threat” or “act” words for each topic
- The selection of topic words is based on:
 - ▶ definition of the phenomenon itself;
 - ▶ human reading and textual analysis of 44,000 front pages of NYT;
 - ▶ analysis of language around key dates.
- Notes:
 - ▶ We exclude from searches articles containing words (such as movies, anniversaries, obituaries, books) associated with false positives.
 - ▶ We account for the evolution of language over time.

The 2022 paper contains several exercises showing validity of the index

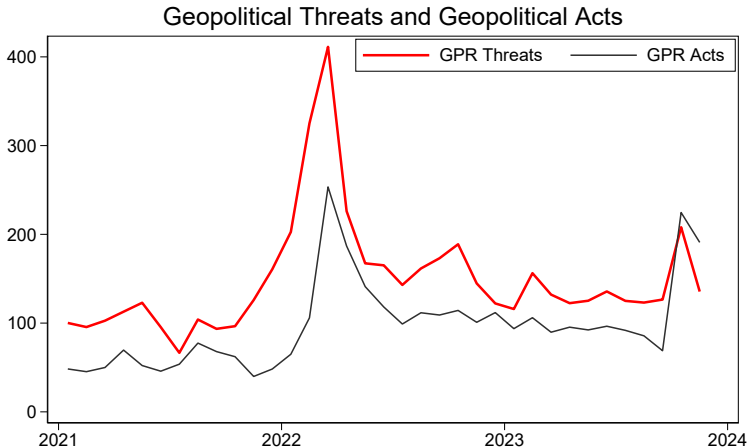
- Index Passes a Plausibility Test
- Index Uses Words that Reflect Changes in the Use of Language
- Index is Compared with Other Indicators of Conflict and War News

Geopolitical Threats and Geopolitical Acts

- GPR index captures a mix of shocks to various moments of the distribution of geopolitical events.
- We break the index down into:
 - ▶ Geopolitical Threats (GPT): Search categories describing war and terror threats, military buildups, nuclear threats;
 - ▶ Geopolitical Acts (GPA): Search categories describing beginning and escalation of conflict, terrorist acts.
- Many spikes in GPT and GPA associated with occurrence of geopolitical acts, yet some movements in GPT may happen when no underlying act materializes.

Threats and Acts in 2022

- GPT index surged between January and March, declined in April.
- GPA index spiked in the aftermath of the invasion.



Global Shortages Index

- Shortages News Index: newspaper articles related to supply-based scarcity, including shortages, rationing, bottlenecks.

