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Monetary Policy Reaction to Geopolitical Risks: Some Nonlinear Evidence

William Ginn[1], Jamel Saadaoui[2]

[1] Labcorp, Artificial Intelligence, USA and Coburg University of Applied Sciences, Germany, William.Ginn.OBA@said.oxford.edu
[2] BETA, CNRS, University of Strasbourg 46 Avenue de la Foret Noire Strasbourg 67000 France, jamelsaadaoui@gmail.com

How do geopolitical risk shocks impact monetary policy? Based on a panel of 20 economies, we develop and estimate an augmented panel Taylor rule via linear and nonlinear local projections (LP) regression models. First, the linear model suggests that the interest rate remains relatively unchanged in the event of an geopolitical risk shock. Second, the result turns out to be different in the nonlinear model, where the policy reaction is muted during an expansionary state, which is operating in a manner proportional to the transitory shock. However, geopolitical risks can amplify the policy reaction during a non-expansionary period.

After the global financial crisis, international trade relations have been increasingly influenced by geopolitical considerations. Indeed, it is now widely recognized that geopolitical risks and bilateral political tensions can have a strong influence on the functioning of the economy (Caldara and Iacoviello, 2022). Geopolitical risk shocks affect the economy through different channels. Some of them are inflationary, such as the commodity price channel, especially the oil price (Mignon and Saadaoui, 2024), and the currency channel (Gopinath, 2015). In addition, other channels are deflationary, such as the consumer sentiment channel and the financial condition channel (Forbes and Warnock, 2012). It is difficult to determine ex ante whether geopolitical risk shocks are inflationary or deflationary. Recent research suggests that geopolitical shocks tend to be inflationary throughout history (Caldara et al., 2022).

Consequently, periods marked by high geopolitical risk have potentially adverse consequences for an economy. Central banks, when implementing monetary policy, consider the prevailing economic conditions, including states of uncertainty. The Taylor rule provides a framework for central banks to adjust interest rates based on economic indicators, and this adjustment can be influenced by the level of the uncertainty. Our main results are highlighted as follows: (i) we estimate an augmented Taylor rule based on a geopolitical risk shock via panel linear and nonlinear LP models; (ii) the linear LP indicates that a geopolitical risk shock corresponds to a delayed and statistically insignificant policy reaction; (iii) empirical results reveal presence of state dependence; (iv) an geopolitical risk shock leads to an amplification of the policy reaction during a state of high GPR.

Highlights

• We estimate an augmented Taylor rule based on an uncertainty shock via panel linear and nonlinear LP models.

• The linear LP model indicates that a geopolitical risk shock corresponds to a delayed and insignificant policy reaction.

• Empirical results reveal the presence of a state dependence.

• A geopolitical risk shock leads to an amplification of the policy reaction during a non-expansionary state.

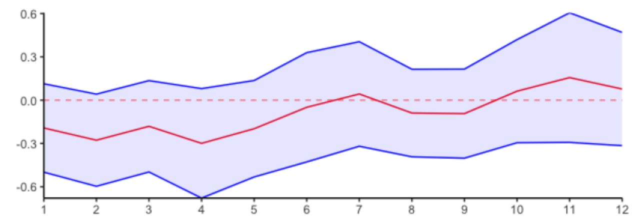
Materials and Methods

To consider the global impact of geopolitical risk, we use a rich data set for industrial production, consumer price index (CPI), short-term interest rate, GPR and EPU for 20 economies that represent around 82% of global GDP to analyze the effect of GPR on interest rates. These economies include Brazil (BRA), Switzerland (CHE), Chile (CHL), Canada (CAN), China (CHN), Columbia (COL), Czech Republic (CZE), Euro zone (19 countries; EUR), United Kingdom (GBR), Hungary (HUN), Ireland (IRL), India (IND), Israel (ISR), Japan (JPN), Mexico (MEX), South Korea (KOR), Poland (POL), Russia (RUS), Sweden (SWE) and the United States (USA). We use monthly data that cover January 1999 to February 2022.

The Taylor rule is designed to capture the reaction of central banks to deviations in inflation and output (Taylor, 1993). By examining the rule in expansionary and nonexpansionary states, this research may offer insight into how central banks adjust interest rates in response to economic conditions in the presence of uncertainty shocks. The LP model, developed by Jordà (2005), is used to estimate an augmented Taylor rule based on a GPR shock. Periods marked by high GPR have potentially adverse consequences for an economy. Central banks, when implementing monetary policy, consider the prevailing economic conditions, including states of uncertainty.

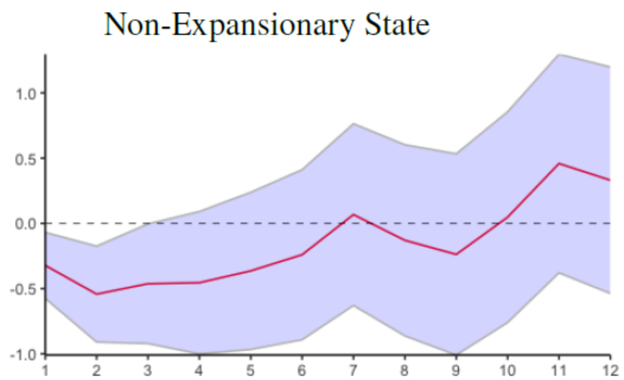
Results

First, the IRFs suggest that a GPR shock corresponds to a lower interest rate, although the effect is not statistically significant in the linear case.



Second, we extend the linear LP model to include non-linear regime-switching to examine whether a GPR shock is state-dependent. The transition variable for the baseline model is based on the twelve-month-centered moving average of the output growth rate for the baseline nonlinear model.

The policy reaction, however, turns out to respond differently during a nonexpansionary state. Consequently, the response becomes more accommodative at the onset of the shock and is statistically significant for periods 1 to 3, which takes until around period 7 to return to pre-shock levels. This finding implies that it is the amplification of the policy reaction of the central banks to GPR shocks during a nonexpansionary state. The occurrence of GPR shocks during a nonexpansionary state may function as an incentive for the central bankers to further reduce the interest rate in order to cope with possible future adverse geopolitical events.



Overall, our findings reveal that state dependence matters in relation to how the monetary policy reaction responds, depending on the state of economic conditions in the presence of a GPR shock. A GPR shock leads to attenuation (amplification) of the policy reaction during an expansionary (non-expansionary) state.

In this context, our analysis provides empirical evidence suggesting that an increase in GPR shocks leads to increased risk aversion among policymakers, who become more cautious especially during recessions and uncertain times. One of the main conclusions is that policy makers include the influence of geopolitical risks in their decisions amongst the major economies of the world.

Conclusions

This paper analyzes the effect of a GPR shock on the interest rate response via linear and nonlinear LP model. The models are estimated based on a balanced panel of 20 economies observed between January 1999 and February 2022. This paper contributes to the literature on the conduct of monetary policy in two broad ways. First, our contribution introduces an augmented Taylor rule with GPR shocks. This augmented Taylor rule is estimated with panel LP models. This paper attempts to shed light on the impact of a GPR shock on monetary policy based on a linear and nonlinear LP panel model, controlling for endogenous relationships. The modeling framework used in this paper further relaxes the assumption that the effect of a GPR shock is linear. The baseline model is extended to capture the possible nonlinear relationships in the data during periods of economic expansion.

Second, the non-linear model demonstrates that a GPR shock results in a muted interest rate policy response during an expansionary state. There is no policy dilemma where the interest rate response operates in a manner that is proportional to the transitory nature of the shock and considering the effect of monetary policy comes with a lag. The impact of a GPR shock on monetary policy turns out to be different during a non-expansionary state.

Possible policy implications

The findings of this area of research are of historical interest with respect to policy implications. A starting point for short-term policy is to establish sources of vulnerability that could create economic risks. The findings of this paper serve to do just that, offering new insights via the analysis of the propagation mechanisms through which GPR shocks influence economic conditions as a source of vulnerability. Global financial conditions can affect a country's financial stability. Policymakers should be vigilant about developments in global financial markets, as shocks originating in the home or abroad can quickly spill over to domestic institutions, affecting overall financial stability

Main References

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https://infer-research.eu/

Contact:
publications@infer.info