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Geopolitical risk and U.S. investment-at-risk☆

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ABSTRACT

Geopolitical risk predicts a deterioration in U.S. investment-at-risk. A 30-point increase in historical GPR is associated with a 1.8-percentage-point decline in the fifth conditional percentile of next-quarter investment growth,compared with 0.15 percentage points at the mean. Median and upper-tail estimates are close to zero. The pattern survives financial and macroeconomic controls. Monthly time-varying local projections identify responses under the restriction that other economic shocks do not affect GPR within the month. Identified shocks persistently lower the fifth percentile relative to the median, with larger responses during high-GPR episodes.

1. Introduction

Geopolitical tensions can delay investment even when their average macroeconomic effect appears modest. With costly reversibility, uncertainty raises the option value of waiting, so firms postpone projects until information improves (Dixit and Pindyck, 1994; Bloom, 2009). Firm-level evidence also links geopolitical risk (GPR) to lower capital expenditure, especially when capital is difficult to reverse (Wang et al., 2024). This mechanism implies a distributional prediction: GPR may worsen unusually adverse investment outcomes without shifting the center of the investment distribution by the same amount.

The investment literature links uncertainty to inaction when capital is partly irreversible (Bloom et al., 2007). Capital spending declines around elections (Julio and Yook, 2012), with policy uncertainty (Gülen and Ion, 2016), and with firm-specific political risk (Hassan et al., 2019). Caldara and Iacoviello (2022) document lower investment following geopolitical innovations, while Wang et al. (2024) emphasize capital irreversibility. We examine where the aggregate investment-growth distribution deteriorates beyond these mean and firm-heterogeneity results.

Investment-at-risk measures the severity of an adverse investment outcome at a fixed conditional probability. It can reveal worsening downside risk even when a mean forecast changes little. The fifth-percentile-minus-median gap further distinguishes a deteriorating lower tail from a common shift in the distribution. For capital-formation surveillance, a stable central forecast can therefore conceal a worsening adverse scenario.

Quarterly quantile regressions characterize predictive associations. Monthly TVP-LPs trace responses of fitted investment-risk measures to recursively identified GPR innovations. Their structural interpretation rests on a within-month exclusion motivated by Caldara and Iacoviello (2022), defended in Section 4 and Appendix A.5.

Other channels include war-related trade disruption (Glick and Taylor, 2010), trade-policy uncertainty (Handley and Limão, 2017), and political risk premia (Pástor and Veronesi, 2013). Threats may raise the

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option value of waiting, whereas acts combine uncertainty with physical, trade, and financial disruption. Component comparisons, financial controls, and durable-expenditure results can distinguish mechanism-consistent patterns, but no single comparison identifies a mechanism in isolation.

Adrian et al. (2019, 2022) show how financial conditions reshape downside growth risk across horizons. Loria et al. (2025) study fitted macroeconomic tail-risk responses to identified shocks. Furceri et al. (2025) document that several economic, financial, and uncertainty-related predictors have a stronger impact on upside risks to public debt. Reynolds and Lloyd (2026) estimate panel quantile LPs for 18 advanced and nine emerging economies over 1997Q4–2025Q1, examining GDP, inflation, trade, and yields. We isolate national-accounts investment, use a U.S. postwar sample beginning in 1947, compare threats with acts, and estimate time-varying investment-risk responses. The contribution concerns both the concentration of GPR's predictive information in adverse investment outcomes and the subsequent propagation of downside risk.

Higher GPR predicts lower investment-at-risk, with little association at the mean, median, or upper tail. The pattern survives financial and macroeconomic controls. Monthly TVP-LPs identify a persistent downside deterioration under the maintained restriction. Attenuation of the quarterly coefficient after 1971 motivates allowing propagation to vary over time.

2. Data and method

The underlying quarterly sample runs from 1947Q1 to 2025Q1. Real gross private domestic investment is the U.S. Bureau of Economic Analysis series distributed by FRED.[1] We use $y_t = 100\Delta\log(I_t)$. Real GPDI is the appropriate outcome because the paper concerns national-accounts capital formation and inventory investment; purchases of financial assets reallocate claims and are not investment in this sense. The historical GPR index (GPRH) of Caldara and Iacoviello (2022) starts in 1900. We convert the monthly index to quarterly frequency by averaging its three monthly observations. The U.S. provides both a long, internally consistent investment series and direct exposure to global geopolitical developments, but our evidence need not generalize to other economies.

Following the at-risk approach of Adrian et al. (2019), we estimate the one-quarter-ahead conditional quantile regression

$$Q_\tau(y_{t+1} \mid g_t, y_t) = \alpha_\tau + \beta_\tau g_t + \gamma_\tau y_t, \tag{1}$$

For $\tau = 0.05, 0.10, \ldots, 0.95$, g_t denotes GPR and β_τ measures its predictive association with the corresponding conditional quantile, holding current investment growth fixed. No causal interpretation is assigned to these quarterly coefficients. We report 90% confidence intervals using the quantile-regression HAC estimator of Galvao and Yoon (2024) and the smooth extended tapered block bootstrap of Gregory et al. (2018). Related work on testing growth vulnerabilities and macro-financial linkages also emphasizes time-series inference in quantile regression (Furno et al., 2025). We also simulate a VAR(4) in investment growth and GPR to obtain the coefficient bands implied by a linear data-generating process. Robustness specifications add the Baa–Aaa corporate credit spread and current GDP growth.

Quarterly GPDI provides a long sample spanning infrequent disruptions. Estimated monthly accounts permit structural responses of fitted conditional quantiles and interquantile gaps to be traced over monthly horizons. Identification is imposed in this second exercise.

[1] FRED series GPDIC1; billions of chained 2017 dollars, seasonally adjusted at an annual rate.

3. Results

The linear benchmark gives a GPR coefficient of −0.005 with a HAC standard error of 0.009. At the fifth percentile, $\widehat{\beta}_{0.05}$ is approximately −0.06 (Fig. 1). A common 30-point increase in GPRH thus predicts a 1.8-percentage-point lower fifth percentile of next-quarter growth, compared with 0.15 percentage points at the mean, holding current growth fixed. The fifth percentile measures severity at a fixed 5% conditional probability. Median and upper-tail estimates are close to zero; lower-tail coefficients fall outside the linear-model bands. HAC and bootstrap inference give the same qualitative ranking.

The asymmetry is not eliminated by observable financial or cyclical conditions. When the Baa–Aaa spread is included, GPR remains most negative in the lower tail; adding current GDP growth produces a similar profile (Online Appendix, Figures A.2–A.3). A specification using a long-run financial-stress proxy yields the same conclusion (Figures A.4–A.6). Distribution regressions provide an estimator-level check: higher GPR is associated with a greater probability of growth falling below severe negative thresholds, with no precise association at favorable thresholds (Figure A.20).

The long sample is informative but not innocuous. In the 1971–2025 subsample, the fifth-percentile estimate remains negative but is smaller and its 90% confidence intervals include zero, while financial conditions become more informative (Figures A.7–A.9). Removing the earliest Korean War observations also attenuates the coefficient (Figure A.10). This instability motivates the time-varying structural analysis below: an average full-sample coefficient can conceal large responses in high-tension periods.

Fig. 2 separates geopolitical threats from realized acts. Threats have more negative lower-tail point estimates, although the formal comparison does not reject equality.[2] The point-estimate ranking is consistent with a wait-and-see mechanism, but cannot distinguish it conclusively from other channels. Supplementary durable-expenditure results are likewise mechanism-consistent patterns rather than mechanism identification (Figures A.21–A.24).

4. Structural time-varying responses

Monthly dynamics use Barrett's (2025) estimated U.S. national accounts over 1990M1–2025M1. GPR is ordered first: geopolitical innovations may immediately affect investment, volatility, and sentiment, while other economic shocks do not contemporaneously affect GPR conditional on the included history. This applies Caldara and Iacoviello's (2022) quarterly ordering over a shorter interval. Sudden terrorist attacks and military escalations can immediately alter investment plans; monthly U.S. investment or sentiment disturbances are less plausible determinants of their timing. Feedback is permitted at longer horizons.

GPR's event-based construction distinguishes geopolitical coverage from adverse economic news. Caldara and Iacoviello (2022, pp. 1209–1212) validate its distinct content and examine news-crowding effects. Geopolitical crises may raise GPR and volatility together, consistently with our ordering. Their monthly Granger tests do not detect lagged economic predictors, complementing rather than testing the contemporaneous exclusion. Appendix A.5 formalizes and defends this restriction. Short-run identification applies to LPs as well as VARs (Plagborg-Møller and Wolf, 2021).

[2] Appendix A.8 and Figure A.26 report the test of $H_0 : \beta_\tau^T - \beta_\tau^A = 0$. The comparison uses separate specifications on the same sample and 1000 paired smooth extended tapered block-bootstrap replications, preserving the covariance between coefficient estimates. The 90% pointwise intervals include zero at every estimated quantile. The joint test at the fifth and tenth percentiles also fails to reject equality ($W = 0.390$, bootstrap $p = 0.843$; Appendix A.8). Non-rejection does not establish equality, and the decomposition remains suggestive rather than conclusive evidence for the proposed mechanism.

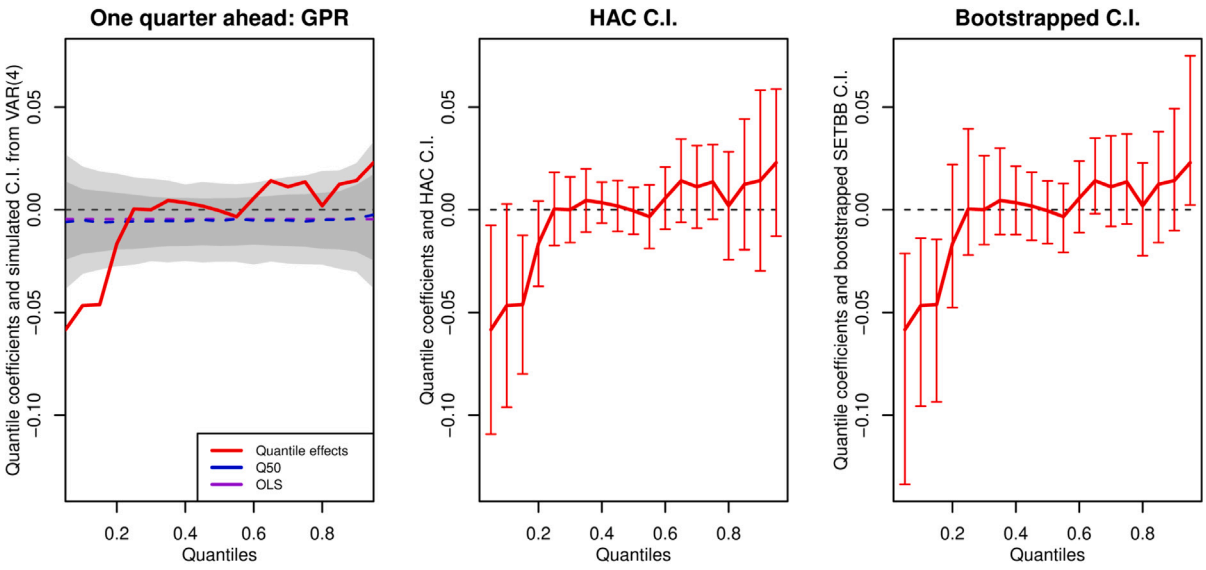

Fig. 1. GPR and the conditional quantiles of next-quarter investment growth. The red line reports $\widehat{\beta}_\tau$ from Eq. (1). The left panel compares the quantile profile with bands simulated from a linear VAR(4); the middle and right panels report 90% HAC and block-bootstrap confidence intervals, respectively.

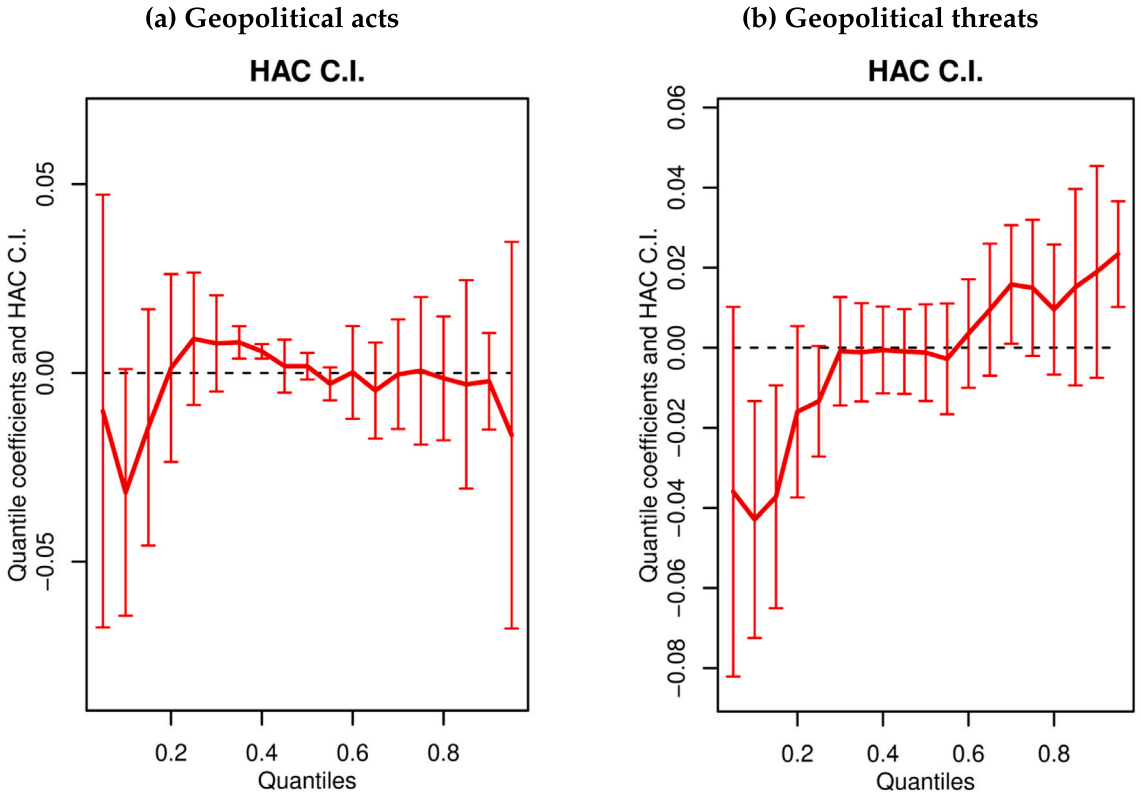

Fig. 2. Quantile coefficients for GPR acts and threats. Panels report point estimates and 90% HAC confidence intervals from separate versions of Eq. (1).

Following Loria et al. (2025), we first estimate one-month-ahead investment-growth quantiles and then trace how these fitted distributional objects respond to the identified shock. We use the path estimator of Inoue et al. (2024):

$$q_{\tau,t+h} = \alpha_{\tau,h,t+h} + \beta_{\tau,h,t+h}\varepsilon_t^{gpr} + \sum_{j=1}^{24} \psi'_{\tau,h,j,t+h}\mathbf{w}_{t-j} + u_{\tau,t+h}, \quad (2)$$

Here $\varepsilon_t^{\text{gpr}}$ is normalized to a one-standard-deviation monthly GPR innovation. Controls comprise lags 1–24 of the fitted quantile, GPR, VIX, and Michigan sentiment. GPR lags condition on predictable history; the contemporaneous exclusion supplies identification. Current volatility and sentiment may transmit the shock. Coefficients vary across dates and horizons $h = 0, \ldots, 15$. Under the restriction, $\beta_{\tau,h,t+h}$ measures the structural response of fitted investment risk.[3]

[3] Following Loria et al. (2025), the first stage constructs a dated one-month-ahead conditional quantile; the second traces its response to the identified innovation. The fixed forecast horizon differs from the impulse-response horizon. The response is not a quantile treatment effect on realized growth.

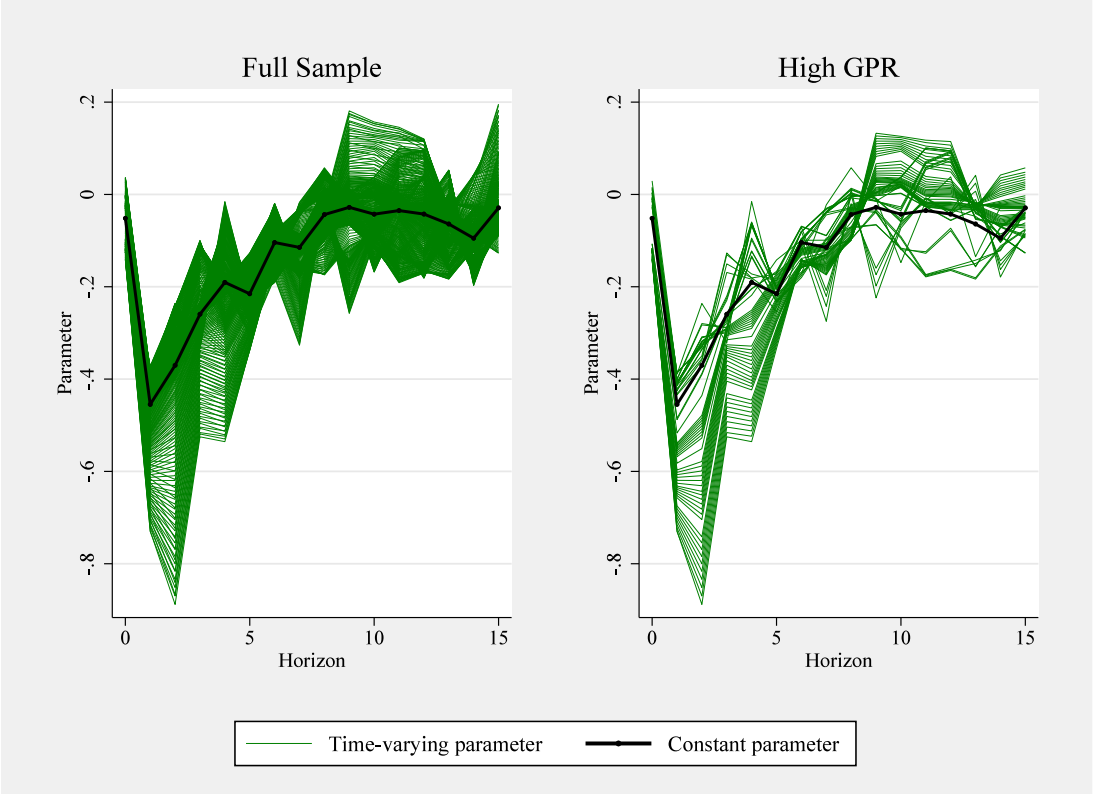

Fig. 3. Time-varying responses of the fifth-percentile-minus-median investment-growth gap to a one-standard-deviation monthly GPR shock. Green lines are date-specific responses; the black line is the constant-parameter response. The right panel retains dates when GPR exceeds its 75th percentile. This selection is descriptive, not a separately estimated threshold model. Horizons are months.

A one-standard-deviation innovation lowers the fifth-percentile-minus-median gap by about 0.4 percentage points after one month in the constant-parameter specification; the response remains negative for roughly seven months (Fig. 3). Selected high-GPR responses approach −0.9 percentage points at short horizons. This is an additional downside deterioration relative to the median. Tenth-percentile responses are weaker, and median-minus-95th-percentile responses much smaller (Figures A.12–A.19). The sharpest amplification occurs in the early 2000s; instability is clearest at short horizons. High-GPR paths describe historical variation, not a separately identified regime effect.

5. Conclusion

GPR contains information about adverse investment outcomes that is largely absent from central forecasts. Monthly TVP-LPs, identified under a defended within-month exclusion, show a lower-tail deterioration relative to the median lasting several months. Larger dated responses coincide with high-tension episodes. Threats have more negative lower-tail point estimates than acts, but equality cannot be rejected, leaving the option-value-of-waiting interpretation suggestive. These findings complement Reynolds and Lloyd's (2026) cross-country tail-risk evidence by isolating capital formation as a distinct downside-risk margin. GPR can inform investment-risk surveillance even when mean forecasts move little.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work, the authors used OpenAI ChatGPT to assist with manuscript restructuring and language editing. After using this service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.econlet.2026.113367.

Data availability

The investment series is publicly available from FRED (GPDIC1), and the historical GPR index is publicly available from https://www.matteoiacoviello.com/gpr.htm. Series definitions and transformations are documented in the Online Appendix.

References

Adrian, T., Boyarchenko, N., Giannone, D., 2019. Vulnerable growth. Am. Econ. Rev. 109 (4), 1263–1289.

Adrian, T., Grinberg, F., Liang, N., Malik, S., Yu, J., 2022. The term structure of growth-at-risk. Am. Econ. J.: Macroecon. 14 (3), 283–323.

Barrett, P., 2025. Estimated monthly national accounts for the United States. IMF Work. Pap. 2025 (134).

Bloom, N., 2009. The impact of uncertainty shocks. Econometrica 77 (3), 623–685.

Bloom, N., Bond, S., van Reenen, J., 2007. Uncertainty and investment dynamics. Rev. Econ. Stud. 74 (2), 391–415.
Caldara, D., Iacoviello, M., 2022. Measuring geopolitical risk. Am. Econ. Rev. 112 (4), 1194–1225.
Dixit, A.K., Pindyck, R.S., 1994. Investment under Uncertainty. Princeton University Press, Princeton, NJ.
Furceri, D., Giannone, D., Kisat, F., Lam, W.R., Li, H., 2025. Debt-at-risk. Centre for Economic Policy Research.
Furno, F., Giannone, D., Iania, L., Loria, F., Schulz, C., 2025. Testing growth vulnerabilities and macro-financial linkages. Mimeo.
Galvao, A.F., Yoon, J., 2024. HAC covariance matrix estimation in quantile regression. J. Amer. Statist. Assoc. 119 (547), 2305–2316.
Glick, R., Taylor, A.M., 2010. Collateral damage: Trade disruption and the economic impact of war. Rev. Econ. Stat. 92 (1), 102–127.
Gregory, K.B., Lahiri, S.N., Nordman, D.J., 2018. A smooth block bootstrap for quantile regression with time series. Ann. Stat. 46 (3), 1138–1166.
Gülen, H., Ion, M., 2016. Policy uncertainty and corporate investment. Rev. Financ. Stud. 29 (3), 523–564.
Handley, K., Limão, N., 2017. Policy uncertainty, trade, and welfare: Theory and evidence for China and the United States. Am. Econ. Rev. 107 (9), 2731–2783.
Hassan, T.A., Hollander, S., van Lent, L., Tahoun, A., 2019. Firm-level political risk: Measurement and effects. Q. J. Econ. 134 (4), 2135–2202.
Inoue, A., Rossi, B., Wang, Y., 2024. Local projections in unstable environments. J. Econometrics 244 (2), 105726.
Julio, B., Yook, Y., 2012. Political uncertainty and corporate investment cycles. J. Financ. 67 (1), 45–83.
Loria, F., Matthes, C., Zhang, D., 2025. Assessing macroeconomic tail risk. Econ. J. 135 (665), 264–284.
Pástor, L., Veronesi, P., 2013. Political uncertainty and risk premia. J. Financ. Econ. 110 (3), 520–545.
Plagborg-Møller, M., Wolf, C.K., 2021. Local projections and VARs estimate the same impulse responses. Econometrica 89 (2), 955–980.
Reynolds, J., Lloyd, S., 2026. Tension across the tail: The cross-country effects of geopolitical risk on macroeconomic tail risk. Econom. Lett. 264, 112927.
Wang, X., Wu, Y., Xu, W., 2024. Geopolitical risk and investment. J. Money Credit. Bank. 56 (8), 2023–2059.