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Research Article

The impact of geopolitical risks on stock markets

Jeopolitik risklerin hisse senedi piyasalarına etkisi

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Abstract

This study investigates how geopolitical risk shocks affect the Turkish stock market using monthly data for 2010:01–2025:11. Geopolitical risk is proxied by the news-based Geopolitical Risk Index (GPR), and BIST-100 monthly returns measure market performance. For robustness, we estimate four alternative models with gradually expanded control sets capturing global risk appetite (VIX), exchange-rate shocks (USD/TRY), commodity shocks (Brent oil and gold), and inflation changes (CPI). The empirical strategy combines dynamic regressions with HAC/Newey–West inference, Jordà (2005) local projections to trace horizon-specific responses, and a VAR(p=1) framework as a consistency check. Dynamic regressions indicate that contemporaneous GPR changes are negative but statistically insignificant, whereas VIX shocks have a large, highly significant negative impact on returns. Local projections show that the adverse effect of geopolitical risk increases with horizon length and becomes significantly negative at longer horizons, especially at 12 months. VAR-based impulse responses are imprecise and sensitive to orthogonalisation and are treated as complementary evidence. Overall, geopolitical risk matters mainly over longer horizons, whereas global risk appetite dominates short-run return dynamics

Keywords: Geopolitical Risk, Stock Returns, VAR

Jel Codes: G12, C32, F31

Öz

Bu çalışma, 2010:01–2025:11 dönemine ait aylık verilerle jeopolitik risk şoklarının Türkiye hisse senedi piyasası üzerindeki etkilerini incelemektedir. Jeopolitik risk, haber temelli Jeopolitik Risk Endeksi (GPR) ile; piyasa performansı ise BIST-100 endeksinin aylık getirileriyle ölçülmektedir. Sağlamlık için, küresel risk iştahı (VIX), döviz kuru şokları (USD/TRY), emtia şokları (Brent petrol ve altın) ve enflasyon (TÜFE) değişimlerini içeren kademeli biçimde genişletilmiş kontrol setleri altında dört alternatif model tahmin edilmiştir. Ampirik strateji; HAC/Newey–West çıkarımıyla dinamik regresyonları, ufuk bazlı tepkileri izlemek üzere Jordà (2005) yerel projeksiyonlar yöntemini ve tutarlılık kontrolü için VAR(p=1) çerçevesini birlikte kullanılmıştır. Dinamik regresyonlarda GPR değişimi aynı ayda negatif, fakat anlamsızdır; buna karşılık VIX şokları getirileri güçlü ve anlamlı biçimde düşürmektedir. Yerel projeksiyonlar, jeopolitik riskin etkisinin süre uzadıkça güçlendiğini ve özellikle 12 ayda anlamlı şekilde negatife dönüştüğünü göstermektedir. VAR etki-tepki sonuçları hassas ve düşük tepkilidir. Sonuçlar, jeopolitik riskin kısa vadede sınırlı, uzun vadede ise olumsuz etkili olduğunu; kısa vadede küresel risk iştahının belirleyici kaldığını gösterir.

Anahtar Kelimeler: Jeopolitik Risk; Hisse Senedi Getirileri, VAR

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Introduction

Geopolitical risk is commonly defined as heightened uncertainty stemming from geopolitical tensions—such as interstate or intrastate conflicts, terrorist incidents, and diplomatic frictions—that may disrupt the international political and security environment. (Caldara & Iacoviello, 2022). From a financial markets perspective, geopolitical risk matters insofar as it is priced: it can change expectations about future cash flows and the discount rate, thereby affecting asset prices through time-varying risk premia and shifts in investors' risk perceptions. (Pastor & Veronesi, 2013; Bekaert et al., 2013). Accordingly, geopolitical risk shocks may influence portfolio allocation, capital flows, and asset pricing via (i) a risk-premium channel (higher required returns and lower valuations), (ii) a cash-flow/earnings channel (weaker expected activity and profitability), and (iii) a financial-conditions channel operating through exchange rates and global risk appetite. Empirically, these channels are often more pronounced in emerging markets, where risk perceptions and capital-flow sensitivity tend to be higher. (Erb et al., 1996; Bilson et al., 2002; Caldara & Iacoviello, 2022).

Multiple theoretical perspectives have been proposed to explain the relationship between geopolitical risk and equity prices. The market psychology perspective emphasises that, during periods of heightened uncertainty, investors' decisions are shaped not only by "fundamentals" but also by sentiment, expectations, and attention channels; accordingly, risk shocks may increase risk aversion and depress stock prices (Shiller, 2000). The asymmetric information perspective, in turn, argues that market participants differ in their ability to acquire and interpret information; when uncertainty rises, the behaviour of investors with informational advantages may alter pricing dynamics (Easley and O'Hara, 2004). Within the economic fundamentals framework, geopolitical uncertainty is expected to influence investment, production, and external financing conditions, thereby constraining firm valuations through its effects on expected cash flows and discount rates (Erb et al., 1996; Bilson et al., 2002).

From the standpoint of financial theory, geopolitical risk shocks may be viewed as an uncertainty component that affects the risk–return trade-off through both the expected cash-flow channel and the discount-rate/risk-premium channel. While Modern Portfolio Theory highlights that risk can be managed through diversification (Markowitz, 1952), the CAPM links expected returns to systematic risk (Sharpe, 1964). However, because events such as geopolitical tensions can shift the investment opportunity set and the prevailing uncertainty regime, multi-period frameworks (ICAPM) and multi-factor pricing approaches provide a more flexible basis for explaining how such shocks are reflected in risk premia (Merton, 1973; Ross, 1976). From this perspective, geopolitical risk can be treated as an "uncertainty shock," and the literature shows that uncertainty shocks may increase volatility in financial variables and strengthen flight-to-safety dynamics (Bloom, 2009). Moreover, general-equilibrium models demonstrating that policy uncertainty can affect stock prices and risk premia suggest that geopolitical risk may likewise be linked to risk-premium dynamics through similar mechanisms (Pástor and Veronesi, 2010, 2013).

While the literature has expanded rapidly, the intended contribution of the present study is to provide a clearer identification and timing assessment of how geopolitical risk is priced in an emerging-market equity index. Specifically, this paper adds value in four ways. First, it focuses on Türkiye and the BIST-100, where geopolitical shocks can be readily confounded by shifts in global risk appetite and domestic financial conditions—making careful separation particularly important. Second, the empirical analysis employs a transparent stepwise specification strategy, sequentially expanding controls (global risk appetite, exchange-rate shocks, commodity shocks, and inflation dynamics) to distinguish the effect of geopolitical risk from broader macro-financial forces. Third, the study moves beyond contemporaneous correlations by estimating horizon-specific responses via local projections, thereby testing whether the impact of geopolitical risk on returns is delayed or cumulative over time. Fourth, it employs a long and recent monthly sample (2010:01–2025:11) spanning multiple geopolitical and global risk regimes, and it reports VAR-based evidence as a complementary consistency check. Together, these elements clarify when and under what conditions geopolitical risk shocks matter for aggregate equity returns, and why global risk appetite tends to dominate short-run dynamics in emerging markets.

Against this theoretical background, the remainder of the paper proceeds as follows. We empirically examine how geopolitical risk shocks are priced in the Turkish stock market, with a particular focus on disentangling geopolitical risk from global risk appetite and domestic macro-financial conditions. To this end, we estimate alternative specifications with progressively enriched controls and trace horizon-specific responses to assess whether the impact is immediate or cumulative over time.

Literature

Geopolitical risk may influence investor sentiment and risk perceptions by generating uncertainty from political and military tensions across countries. While Shiller (2000) emphasises that expectations and psychology can be decisive in pricing during periods of uncertainty, studies employing news-based measures show that increases in geopolitical risk can be meaningfully associated with macro-financial variables, indicating that such shocks may strengthen risk aversion and exert downward pressure on equity pricing (Shiller, 2000; Caldara and Iacoviello, 2022).

Beyond macroeconomic and financial applications, the news-based Geopolitical Risk (GPR) index has increasingly been used as a general proxy for geopolitical uncertainty in a broad set of empirical settings. In this broader literature, GPR is employed to examine how geopolitical tensions affect international trade and global value chains, cross-border and foreign direct investment decisions, energy and commodity markets (and energy security), tourism and mobility-related activities, and broader firm-level outcomes such as investment and risk management. Empirical evidence supports these broader applications—for example, trade flows have been shown to respond to geopolitical risk shocks (Mulabdic & Yotov, 2025), foreign direct investment inflows are negatively associated with geopolitical risk in multi-country settings (Kapopoulos et al., 2025), tourism demand declines persistently following geopolitical risk shocks (Papagianni et al., 2024), and energy markets exhibit heightened downside risk under geopolitical tensions (Apergis & Fahmy, 2024). Accordingly, GPR is not only an asset-pricing risk factor but also a versatile indicator of uncertainty that helps evaluate how geopolitical shocks transmit to economic activity through multiple channels (Caldara & Iacoviello, 2022). Building on this broader research agenda, the present study narrows its focus to the financial markets branch of the GPR literature. It examines the effects of geopolitical risk shocks on Turkish equity returns, while explicitly accounting for global risk appetite and domestic macro-financial conditions. Accordingly, the literature on geopolitical risk and financial markets can be organised into two main strands—(i) political/country-risk factors in asset pricing and risk premia, and (ii) news-based uncertainty indices (including GPR) and their effects on stock returns and volatility—providing the conceptual basis for our stepwise control strategy and horizon-specific identification.

The first strand focuses on the role of "country risk/political risk" components in asset pricing and risk premia. Erb et al. (1996) discuss the economic information embedded in political/economic/financial risk measures and their link to financial pricing, highlighting the importance of risk indicators for investment decisions and expected returns. Similarly, Bilson et al. (2002) examine the relationship between political risk measures and returns in emerging markets, while controlling for global and local factors, and show that political risk can be a critical determinant of portfolio allocation.

The second strand centres on the development of news-based uncertainty/risk indices and on the measurement of their effects on financial markets. Caldara and Iacoviello (2022) developed the Geopolitical Risk (GPR) index based on news text, demonstrating that the index historically spikes during periods of wars, terrorist attacks, and international tensions, and further arguing that increases in GPR are associated with downside risks for macro-financial variables. Because this approach operationalises geopolitical risk as an event-driven shock in empirical asset-pricing settings, it has been widely adopted in recent years in the literature on stock returns and volatility. A closely related measurement tradition quantifies uncertainty using alternative news-based indices and shows that uncertainty shocks are linked to both financial and real activity, reinforcing the plausibility of an expectations-and-discount-rate channel in asset pricing (Baker et al., 2016; Bloom, 2009; Pástor and Veronesi, 2013).

A complementary line of research investigates the relationship between broader measures of "general uncertainty/policy uncertainty" (e.g., news-based indices) and financial markets. For instance, studies developing the economic policy uncertainty index show that uncertainty shocks are strongly linked to both financial and real variables (Baker et al., 2016). This framework provides theoretical support for the view that geopolitical risk shocks may also be transmitted to asset pricing through investors' risk perceptions (Bloom, 2009; Pástor and Veronesi, 2013). In addition, the finance literature emphasises that time-varying risk premia and market volatility contain distinct components related to uncertainty and risk aversion, providing a further conceptual basis for distinguishing geopolitical shocks from shifts in global risk sentiment (Bekaert et al., 2013).

Empirical evidence on the relationship between GPR and financial markets largely concentrates on two dimensions. First, increases in geopolitical risk tend to strengthen the volatility channel. For example, Salisu et al. (2022) report that geopolitical risk indicators increase stock market volatility in emerging markets and that certain components of GPR may exhibit stronger predictive power. Likewise, using a global sample, Zhang et al. (2023) show that GPR can produce statistically significant, positive effects on stock market volatility. Second, the effects on returns are often sensitive to regime, horizon, and the set of controls. Ma et al. (2022) show that geopolitical risk indices—particularly the "threat" component—may yield forecasting signals for stock returns under certain conditions, and that this effect may vary across the business cycle. Similarly, evidence for the G7 suggests that geopolitical risk can reinforce the volatility channel in equity markets (Bouri et al., 2020). Taken together, these studies imply a clear analytical message: while volatility responses to geopolitical risk are relatively robust across samples and methods, return responses are more fragile and tend to depend on horizon, regime conditions, and the control set—especially those that capture global risk appetite and domestic financial conditions. This motivates empirical designs that evaluate horizon-specific effects and transparently separate geopolitical shocks from broader global risk sentiment. This synthesis directly informs our empirical design: we operationalise global risk appetite explicitly (DVIX) to avoid confounding, and we adopt horizon-specific estimation (Local Projections) precisely because the literature indicates that return effects can be delayed and control-dependent rather than purely contemporaneous.

In the Turkish context, the GPR–BIST relationship has been examined using various methods. In particular, studies that jointly employ global and Turkey-specific measures of geopolitical risk and analyse asymmetries across sectoral indices using a long monthly dataset are available (Ceyhan, 2025). In addition, studies examining the relationship between geopolitical risk and stock indices in a panel-causality framework across emerging markets support the argument that geopolitical risk is a non-negligible factor in financial pricing (Üçler and Özşahin, 2020). Overall, the Turkish evidence suggests that equity pricing may be compressed during periods of heightened geopolitical uncertainty, as risk perceptions rise; however, the magnitude and significance of the effect may vary across methodologies, sample periods, and control variables. More recent Türkiye-focused evidence further refines this picture along three dimensions. First, long-horizon frameworks (e.g., ARDL/cointegration-based designs) report adverse long-run linkages between geopolitical risk/uncertainty measures and BIST performance, with effects often becoming more visible over longer horizons or in specific segments such as tourism (Gürbüz, 2024; Vurur & Özdemir, 2023). Second, system-based designs and causality-oriented approaches underscore that estimated return responses can be sensitive to identification and specification choices, implying that conclusions may vary with the included controls and the modelling strategy (Nazlıoğlu, 2025; İltas, 2020; Ceyhan, 2025). Third, sector-level analyses highlight heterogeneity and nonlinearity: the impact of GPR differs across BIST sectors and can be asymmetric, with risk increases often exerting stronger effects than risk decreases and effects varying across market conditions (Irmak, 2025; Bulut et al., 2023). Complementary evidence also suggests that geopolitical risk shocks can be transmitted to key financial sectors, such as banking (Erzurumlu & Akçakanat, 2025). Taken together, the Türkiye literature aligns with the broader international message that return effects are frequently horizon- and control-dependent, providing a direct motivation for employing a transparent stepwise control strategy and horizon-specific estimation. These Türkiye-specific findings motivate a design that maintains comparability of the information set across specifications and allows the return response to emerge over time; accordingly, our stepwise control blocks and horizon-based Local Projections are employed to produce evidence that is directly comparable across models and less sensitive to ad hoc control choices.

Easley and O'Hara (2004) show that investors do not have equal access to information and that differences in information structure can affect pricing through the cost of capital and expected returns. In this context, during periods when geopolitical tensions increase uncertainty, the nature of information flows and heterogeneity in investors' interpretations of events may raise risk premia and exert downward pressure on equity prices (Easley and O'Hara, 2004; Caldara and Iacoviello, 2022). Moreover, in emerging markets, shifts in global risk appetite and capital flows can have pronounced effects on local market returns; therefore, during crisis and uncertainty episodes, foreign investor behaviour and flight-to-safety dynamics may depress stock prices (Bekaert and Harvey, 2000; Cboe Global Markets, 2022).

In sum, the literature suggests that geopolitical risk has the potential to (i) increase volatility, (ii) strengthen risk aversion, and (iii) under certain conditions, generate delayed and horizon-dependent effects on returns (Caldara and Iacoviello, 2022; Salisu et al., 2022; Zhang et al., 2023; Ma et al., 2022). In the Turkish case, findings further indicate that the magnitude of the effect may be sensitive to regime changes, sectoral dynamics, and the choice of control variables (Üçler and Özşahin, 2020; Ceyhan, 2025).

Despite this progress, two issues remain underexplored in the Türkiye–BIST setting. The first is whether GPR shocks have delayed, horizon-dependent effects on equity returns, once global risk appetite and domestic financial conditions are controlled for transparently and comparably. The second is that existing Türkiye-focused studies differ substantially in sample periods, proxies, and control choices, making it difficult to assess the robustness and the economic meaning of return responses. This paper addresses these gaps explicitly. In the study, (i) implement a stepwise specification strategy with gradually expanded control sets to disentangle geopolitical risk from global risk appetite and domestic financial conditions, (ii) employ local projections to trace horizon-specific return responses and test for delayed effects, and (iii) use a VAR framework as complementary evidence to assess dynamic consistency. This design directly follows from the literature's key message that return effects are fragile and horizon-dependent, while volatility/global-risk channels are more robust.

Methodology

Data and sample

This study examines the impact of geopolitical risk shocks on the Turkish stock market at a monthly frequency. The sample covers the period 2010:01–2025:11, reflecting the structure of the available dataset. The study is based solely on publicly available secondary data and does not involve human participants; therefore, ethical approval is not required. Market performance is proxied by the BIST-100 index, while geopolitical risk is measured using the news-based Geopolitical Risk Index (GPR) developed by Caldara and Iacoviello (2022). Global risk appetite is proxied by the VIX; the use of the VIX as a market-implied volatility-based risk indicator is well established in the literature (Cboe Global Markets, 2022). Macro-financial series for Türkiye—such as the exchange rate and the price index—are compiled from the Central Bank of the Republic of Türkiye (CBRT) 's data infrastructure.

The sample starts in 2010:01 to obtain a long, internally consistent post-global-crisis window in which the key series (BIST-100, USD/TRY, CPI, VIX, Brent, gold, and the GPR index) are jointly available and comparable on a common monthly calendar. This start date also allows the analysis to span multiple geopolitical and global risk regimes, thereby improving the power of horizon-dependent inference. Importantly, 2010 also coincides with a period in which Türkiye was directly exposed to salient geopolitical tensions—for example, the 31 May 2010 Mavi Marmara incident, which triggered an acute Türkiye–Israel crisis and is emblematic of heightened geopolitical risk in the region. The monthly frequency is chosen to ensure consistency across all series and to match the sampling structure of the GPR index, which is commonly used at a monthly frequency in the empirical literature. Moreover, several key domestic variables (e.g., CPI) are naturally observed and interpreted at the monthly horizon, making monthly aggregation a transparent and comparable choice for the full information set. The control variables are selected to represent the main transmission channels emphasised for emerging markets: (i) global risk sentiment (VIX), (ii) the exchange-rate/financial-conditions channel (USD/TRY), (iii) commodity-price shocks capturing external conditions and safe-haven dynamics (Brent oil and gold), and (iv) domestic inflation conditions (CPI).

Construction of final variables

To facilitate the interpretation of coefficients as "shock effects" and to mitigate potential non-stationarity concerns in levels, variables are constructed using natural logarithms (ln) and first differences. Accordingly, the dependent variable is defined as the monthly log return on the BIST-100 index and is multiplied by 100 to express it in percentage terms. The geopolitical risk, shock and control variables are defined as monthly log changes (log differences), thereby rendering them comparable on a common scale. This transformation strategy is widely used in applied econometrics (Wooldridge, 2009).

Table 1 reports only the final variables employed in the models. Abbreviations are used consistently throughout the study.

Table 1: Final Variables and Their Construction

Abbreviation	Variable (final definition)	Construction	Data source	Frequency Sample period
RET	BIST-100 monthly return	RET_t=100× [ln($BIST100_t$)−ln($BIST100_{t-1}$)]	CBRT EVDS	Monthly; 2010:01–2025:11
DGPR	Geopolitical risk shock	$DGPR_t$=ln(GPR_t)−ln(GPR_{t-1})	policyuncertainty.com /gpr.html	Monthly; 2010:01–2025:11
DVIX	Global risk shock	$DVIX_t$=ln(VIX_t)−ln(VIX_{t-1})	Investing.com	Monthly; 2010:01–2025:11
DFX	Exchange rate shock (USD/TRY)	DFX_t=ln($USDTRY_t$)−ln($USDTRY_{t-1}$)	CBRT EVDS	Monthly; 2010:01–2025:11
DOIL	Oil shock (Brent)	$DOIL_t$=ln($BRENT_t$)−ln($BRENT_{t-1}$)	Investing.com	Monthly; 2010:01–2025:11
DGOLD	Gold shock (gold ounce, USD)	$DGOLD_t$=ln(GOLDt)−ln($GOLD_{t-1}$)	Investing.com	Monthly; 2010:01–2025:11
DCPI	Inflation change (CPI)	$DCPI_t$=ln(CPI_t)−ln(CPI_{t-1})	CBRT EVDS	Monthly; 20 2010:01–2025:11

Under these definitions, DGPR is the key explanatory variable, capturing monthly changes in geopolitical risk. The main hypothesis of the study is that increases in geopolitical risk reduce risk appetite and exert downward pressure on stock returns; therefore, the coefficient on DGPR is expected to be negative (Caldara and Iacoviello, 2022).

Model design: sequential inclusion of control variables

To estimate the effect of geopolitical risk on stock returns while transparently demonstrating the sensitivity of the core coefficient (the effect associated with DGPR) to model specification, control variables are incorporated sequentially (stepwise). This approach is widely adopted in applied work to improve reporting transparency and to mitigate omitted-variable bias (Angrist and Pischke, 2009; Wooldridge, 2009). Accordingly, four models are defined. All models share the same dependent variable (RET) and the same main regressor (DGPR); they differ only in the breadth of the control set. The equations below define the sequential control sets; in dynamic estimations, these blocks are implemented within the same core dynamic structure (i.e., with RET lags).

Model 1 is the most parsimonious specification, capturing the unconditional effect of the geopolitical risk shock:

Model 1: $RET_t=\alpha+\beta DGPR_t+\varepsilon_t$

Model 2 controls for global risk appetite to separate the effect of geopolitical risk from broader global uncertainty:

Model 2: $RET_t=\alpha+\beta DGPR_t+\gamma_1 DVIX_t+\varepsilon_t$

Model 3 adds the exchange rate channel to account for the transmission of geopolitical risk through currency movements:

Model 3: $RET_t=\alpha+\beta DGPR_t+\gamma_1 DVIX_t+ \gamma_2 DFX_t+\varepsilon_t$

Model 4 further expands the control set by incorporating commodity and inflation channels, thereby testing whether the geopolitical risk coefficient remains stable under a more comprehensive conditioning information set:

Model 4: $RET_t= \alpha+\beta DGPR_t+\gamma_1 DVIX_t+ \gamma_2 DFX_t +\gamma_3 DOIL_t+\gamma_4 DGOLD_t+\gamma_5 DCPI_t+\varepsilon_t$

Within this framework, the primary parameter of interest is β. As the model evolves from Model 1 to Model 4, the preservation of the sign of β and the relative stability of its magnitude would indicate that the relationship between geopolitical risk and BIST returns is not merely a superficial correlation driven by the control structure, but rather a more robust association (Angrist and Pischke, 2009; Wooldridge, 2009).

Methodology: Estimation of Model 1–Model 4 specifications

Dynamic regression approach (Model 1–Model 4)

To quantify both the contemporaneous and lagged effects of geopolitical risk shocks on BIST returns, the Model 1–Model 4 specifications are estimated within a dynamic regression framework. Given the potential for autocorrelation in monthly returns, lagged values of the dependent variable are included to introduce a dynamic structure. Under this approach, each control specification is estimated conditional on the same dynamic core; only the scope of the control vector expands from Model 1 to Model 4. The general estimating equation is as follows:

$$RET_t = \alpha + \sum_{i=1}^{p} \phi_i RET_{t-i} + \beta DGPR_t + \Gamma' x_t^{(m)} + \varepsilon_t \qquad (1)$$

Here, $x_t^{(m)}$ denotes the vector of control variables included in the mmm-th specification. Model 1 includes no control vector. In Model 2, only $DVIX_t$, which proxies global risk appetite, is added. Model 3 further includes the exchange-rate channel via DFX_t. Model 4 employs the broadest control set by additionally incorporating the commodity and inflation channels through $DOIL_t$, $DGOLD_t$, and $DCPI_t$.

Because financial time series may exhibit time-varying volatility and autocorrelation, statistical inference for the estimated coefficients is conducted using heteroskedasticity- and autocorrelation-consistent (HAC/Newey–West) standard errors (Newey and West, 1987).

Local projections approach (Model 1–Model 4)

Because the impact of geopolitical risk shocks may not be confined to the contemporaneous month and may propagate into subsequent months, the time profile of the effect is estimated using Jordà's (2005) Local Projections (LP) method (Jordà, 2005). This approach directly produces the effect of the shock on returns h=0,1,…,Hh=0,1,\ldots,Hh=0,1,…,H months ahead by estimating a separate regression for each horizon. The same logic for the control structure is maintained: for each horizon, Models 1–4 are estimated separately, and the scope of the control vector is expanded sequentially across specifications. The general form is given by:

$$RET_{t+h} = \alpha_h + \beta_h DGPR_t + \sum_{i=1}^{p} \psi_{h,i} RET_{t-i} + \Delta_h' x_t^{(m)} + u_{t+h} \qquad h=0,1,\ldots,H \qquad (2)$$

Under this framework, the coefficients βh provide direct information on (i) the horizon at which the effect of a geopolitical risk shock is strongest, (ii) whether the effect decays over time, and (iii) whether it exhibits persistence. The comparison across Model 1–Model 4 further reveals, in a dynamic setting, whether the estimated shock effect disappears once additional control channels are introduced or remains robust even after conditioning on them. As in the dynamic regression approach, inference in the LP estimations employs robust standard errors to account for potential autocorrelation and heteroskedasticity (Newey and West, 1987).

VAR approach (Model 1–Model 4)

To assess the propagation of geopolitical risk shocks within a system in which variables co-move jointly, we employ a vector autoregression (VAR) framework (Sims, 1980). The same "Model 1–Model 4" logic is preserved at this stage; however, the key difference is that the control sets are incorporated not into a single-equation regression but sequentially into the system vector. Following Sims (1980), we estimate a reduced-form VAR(p) model of the form:

$$Y_t = c + \sum_{i=1}^{p} A_i Y_{t-i} + u_t \qquad (3)$$

where Y_t is a K×1 system vector, c is a K×1 vector of intercepts, A_i are K×K coefficient matrices, and u_t is a K×1 vector of reduced-form innovations with $E(u_t)=0$ and $E(u_t u'_t)=\Sigma_u$ (Sims, 1980).

With the stepwise inclusion of control sets, the system vector Yt is defined under four alternative configurations. VAR results are reported through impulse response functions (IRFs) that trace the response of RET to a geopolitical risk shock. As the control set expands from Model 1 to Model 4, the stability of the IRF profile is evaluated as evidence on the robustness of the findings at the system level (Sims, 1980).

Estimation details and reporting strategy

Across the three empirical approaches—dynamic regression, Local Projections, and VAR—we report the Model 1–Model 4 specifications jointly to transparently assess the sensitivity of the geopolitical risk coefficient to the choice of controls. The lag length is selected using information criteria (AIC/BIC) and held constant within each approach to ensure comparability across Models 1–4. In the dynamic regression and Local Projections estimations, inference relies on HAC/Newey–West standard errors due to the prevalence of autocorrelation and heteroskedasticity in financial time series (Newey and West, 1987). In the VAR analysis, the magnitude, direction, and rate of decay of the geopolitical risk shock are summarised through impulse response functions, and the continuity of the results is assessed as the control blocks are expanded (Sims, 1980). This unified design allows findings to be compared within a single coherent framework—at the level of coefficient estimates, dynamic response profiles, and system-wide interactions—under consistent control blocks.

Results

This section reports the empirical findings obtained under the dataset and the Model 1–Model 4 specifications defined in Section 3. The exposition follows a structured sequence: (i) descriptive statistics summarising distributional and volatility properties; (ii) stationarity evidence assessing the suitability of the series for time-series estimation; (iii) a preliminary view of co-movement across variables (correlations); (iv) baseline results from dynamic regressions with a sequentially expanding control set; (v) the time profile of the effect using Local Projections; and (vi) a system-level assessment using VAR impulse response functions (VAR-IRF).

Table 2: Descriptive Statistics

Variable	Mean	Std.Dev.	Min	Max	Skewness	Kurtosis	JB	JB-p
RET	1.593	7.269	-16.754	22.565	0.272	3.119	2.353	0.308
DGPR	0.003	0.205	-0.600	0.696	0.376	4.139	13.539	0.001
DVIX	-0.002	0.235	-0.614	0.853	0.325	3.776	7.410	0.025
DFX	0.018	0.040	-0.087	0.251	1.890	11.516	648.136	0.000
DOIL	-0.001	0.095	-0.634	0.357	-1.500	13.667	914.225	0.000
DGOLD	0.007	0.034	-0.071	0.114	0.271	3.171	2.417	0.299
DCPI	0.016	0.019	-0.015	0.127	2.545	12.433	860.561	0.000

Table 2 indicates pronounced excess kurtosis and strong departures from normality, particularly for DFX, DOIL, and DCPI. This pattern is consistent with the fat-tail behaviour commonly observed in financial time series and supports the use of robust standard errors in subsequent estimations. Deviations from normality are also statistically evident for DGPR and DVIX, suggesting that geopolitical and global uncertainty shocks in the sample operate through regime-like jumps rather than smooth fluctuations. The particularly high skewness and kurtosis of DFX and DCPI imply that episodic, non-normal spikes characterise exchange-rate and inflation shocks. In emerging markets, such spikes can rapidly affect the risk premium (discount rate) channel, inducing abrupt volatility in returns. The rejection of normality by the Jarque–Bera test for DGPR and DVIX further is consistent with the view that geopolitical/global uncertainty shocks manifest not as frequent small variations but as relatively rare yet large disturbances. Accordingly, even if contemporaneous mean-return regressions do not yield strong statistical separation for DGPR, the descriptive evidence leaves open the possibility of regime- or horizon-dependent effects.

Table 3: Stationarity Tests (ADF and KPSS)

Variable	ADF statistic	ADF p-value	ADF lag	KPSS statistic	KPSS p-value
RET	-13.1844	<0.0001	0	0.3671	>0.1000
DGPR	-8.0471	<0.0001	5	0.0667	>0.1000
DVIX	-9.2716	<0.0001	3	0.0649	>0.1000
DFX	-10.5245	<0.0001	0	0.0839	>0.1000
DOIL	-8.3027	<0.0001	3	0.0625	>0.1000
DGOLD	-9.9229	<0.0001	0	0.5026	>0.1000
DCPI	-3.1997	0.0200	6	1.1837	0.0463

Notes: ADF denotes the Augmented Dickey–Fuller (Dickey & Fuller, 1979) test with an intercept (null: unit root), with lag length selected by an information criterion. KPSS denotes the Kwiatkowski–Phillips–Schmidt–Shin (Kwiatkowski et al., 1992) test with an intercept (null: stationarity), with automatic bandwidth selection.

The stationarity results in Table 3 indicate that the ADF test rejects the unit-root null for all variables at conventional significance levels. This provides strong evidence that the transformed series—constructed in log-difference ("shock") form (and percentage log returns for RET)—are stationary and therefore appropriate for time-series estimation in both regression- and VAR-type frameworks.

The KPSS test, which assumes stationarity as the null hypothesis, generally fails to reject the null of stationarity for RET, DGPR, DVIX, DFX, DOIL, and DGOLD (all reported as $p > 0.1000$). This pattern corroborates the ADF evidence and suggests that these shock series do not exhibit meaningful low-frequency non-stationarity over the sample.

An exception is DCPI, for which the KPSS p-value is 0.0463, implying a rejection of stationarity at the 5% level. This result suggests that inflation changes may contain a more persistent component or be subject to structural changes across subperiods—features plausible in emerging-market macroeconomic dynamics. Nevertheless, given the consistently strong ADF evidence and the empirical analysis's reliance on shock-based transformations, this finding does not constitute a binding obstacle to the modelling strategy. In addition, the use of HAC/Newey–West standard errors in subsequent estimations further mitigates concerns arising from potential serial dependence and time-varying volatility in the residuals. In the next step, we report the correlation structure to provide a preliminary assessment of co-movement among the variables.

Table 4: Correlation Matrix

	RET	DGPR	DVIX	DFX	DOIL	DGOLD	DCPI
RET	1.000						
DGPR	-0.050	1.000					
DVIX	-0.233	0.329	1.000				
DFX	-0.035	0.083	0.096	1.000			
DOIL	0.040	-0.035	-0.090	-0.095	1.000		
DGOLD	0.073	-0.045	0.005	-0.070	0.065	1.000	
DCPI	0.210	0.037	0.028	0.241	0.066	0.058	1.000

The negative correlation between RET and DGPR is directionally consistent with a risk-off interpretation, in which increases in geopolitical risk are associated with lower equity returns; however, the magnitude is small. The more negative correlation between RET and DVIX suggests that Turkish equity returns co-move more strongly with global risk sentiment than with DGPR in the contemporaneous correlation structure. Moreover, the positive correlation between DGPR and DVIX indicates that periods of elevated geopolitical risk often coincide with broader global uncertainty regimes. Taken together, these patterns motivate estimating the DGPR–return relationship while controlling for global risk conditions, to assess whether DGPR contains incremental explanatory content beyond global uncertainty, noting that correlations capture contemporaneous co-movement rather than causal effects.

The generally low-to-moderate correlations are informative in two respects. First, pairwise correlations capture contemporaneous co-movement rather than causal effects; therefore, correlation should not be interpreted as evidence of causality in the absence of an identification strategy (Gujarati & Porter, 2009; Wooldridge, 2010). Second, the weak RET–DGPR correlation ($r=-0.050$) suggests that any return impact of geopolitical risk—if present—may be limited in the contemporaneous mean and/or may arise through non-contemporaneous channels. In relative terms, the RET–DVIX correlation ($r = -0.233$) is larger in absolute value than the RET–DGPR correlation (though still weak-to-moderate), suggesting that global risk conditions may be a more salient contemporaneous correlate of returns in this sample. Accordingly, controlling for DVIX is important because DGPR and DVIX co-move ($r=0.329$), which may otherwise confound the estimated DGPR effect (Gujarati & Porter, 2009; Wooldridge, 2010).

Based on this preliminary evidence, the main results are reported within the dynamic regression framework, with Models 1–4 presented across columns. The lag length is selected using the BIC criterion and set to $p = 6$ in the sample; the same maximum lag is used for HAC/Newey–West standard errors (Newey and West, 1987).

Table 5: Dynamic Regression Results (HAC)

	Model 1		Model 2		Model 3		Model 4	
	Coef.	**p-vlaue**	**Coef.**	**p-vlaue**	**Coef.**	**p-vlaue**	**Coef.**	**p-vlaue**
Constant	1.381***	0.009	1.334***	0.007	1.261***	0.002	0.583	0.294
RET(t-1)	0.090	0.204	0.119*	0.091	0.121*	0.099	0.032	0.711
RET(t-2)	0.055	0.358	0.064	0.250	0.065	0.242	0.015	0.787
RET(t-3)	−0.074	0.332	−0.064	0.358	−0.065	0.358	−0.077	0.285
RET(t-4)	−0.114*	0.089	−0.119*	0.069	−0.121*	0.078	−0.127*	0.067
RET(t-5)	0.013	0.857	0.026	0.719	0.024	0.741	0.035	0.631
RET(t-6)	0.183**	0.015	0.188***	0.009	0.188***	0.010	0.203***	0.005
DGPR	−1.704	0.407	−1.619	0.407	−1.625	0.401	−2.107	0.250
DVIX			−8.179***	0.0003	−8.137***	0.0004	−7.250***	0.0008
DFX					3.806	0.818	−20.102	0.190
DOIL							7.974	0.107
DGOLD							−1.679	0.904
DCPI							91.584***	0.0039
	Model 1		**Model 2**		**Model 3**		**Model 4**	
R²	0.091		0.152		0.152		0.195	
Adj. R²	0.054		0.111		0.106		0.137	
HAC maxlag (p)	6		6		6		6	
BG p-value	0.6728		0.2215		0.1316		0.2796	
BP p-value	0.6871		0.4542		0.0055		0.0108	
ARCH p-value	0.0054		0.0079		0.0057		0.0004	

Notes: Significance levels are denoted as *** p < 0.01, ** p < 0.05, and * p < 0.10. "HAC maxlag (p)" indicates the number of return lags included in the dynamic regression. The lower panel reports diagnostic test p-values: "BG p-value" refers to the Breusch–Godfrey test for serial correlation, "BP p-value" to the Breusch–Pagan test for heteroskedasticity, and "ARCH p-value" to Engle's ARCH test.

The central finding in Table 5 is that the DGPR coefficient remains negative across all specifications, yet it is statistically insignificant in every model (i.e., no significance markers in Models 1–4). This pattern suggests that geopolitical risk shocks do not exhibit a statistically clear same-month average return effect on BIST returns. Put differently, while the sign is consistent with a risk-off interpretation, the lack of statistical significance in mean regressions may reflect several mechanisms: (i) incomplete or gradual incorporation of geopolitical information into prices within the same month, (ii) attenuation of the average effect due to heterogeneity in the intensity and nature of events, (iii) transmission operating primarily through the risk-premium/volatility channel rather than the conditional mean, or (iv) an impact that becomes more visible as the horizon lengthens through delayed or cumulative pricing. These explanations are interpretive and should be read as plausible mechanisms rather than definitive identification.

By contrast, the DVIX coefficient is large and highly significant from Model 2 onward ($p < 0.01$), indicating that Turkish equity returns are strongly associated with fluctuations in global risk appetite. The strong negative DVIX estimate is consistent with the interpretation that increases in global uncertainty act like a "global risk-premium" shock for emerging markets by raising discount rates; consequently, equity prices may be compressed through the discount-rate/risk-premium channel even in the absence of contemporaneous changes in expected cash flows. The improvement in model fit as controls are added (R^2 rising from 0.091 to 0.195) further indicates that global uncertainty and related macro-financial channels contribute meaningfully to explaining return variation.

In Model 4, the positive and strongly significant coefficient on DCPI ($p < 0.01$) indicates that, over the sample period, there are regimes in which changes in inflation co-move positively with equity returns. This finding departs from a simplistic view that inflation necessarily depresses stock prices and instead points to regime-dependent dynamics. However, the estimate should be interpreted as conditional co-movement within the specified model, not as a structural causal effect. For example, inflation changes may coincide with nominal growth and revenue expectations, portfolio rebalancing behaviour, or episodes consistent with financial dominance, leading to periods in which equity returns and inflation move in the same direction. Accordingly, the result suggests that inflation may, at times, behave as a regime-specific component that co-moves with nominal returns and equity pricing rather than operating solely through the real discount-rate channel.

Diagnostic evidence from the lower panel indicates that serial correlation is not a dominant concern (BG p-values do not signal strong autocorrelation). In contrast, the consistently low ARCH p-values across models indicate conditional heteroskedasticity in the residuals, consistent with the volatility clustering commonly observed in financial returns. The decline in BP p-values—particularly in Models 3–4—also supports the presence of heteroskedasticity. These diagnostics reinforce the appropriateness of reporting inference using HAC/Newey–West robust standard errors rather than relying on conventional OLS standard errors.

Finally, the absence of short-run statistical significance for DGPR motivates a horizon-based analysis to assess whether the effect of geopolitical risk emerges in a delayed or cumulative manner. Accordingly, the next section estimates the dynamic response profile using the Local Projections approach and reports results for selected horizons (Jordà, 2005).

Table 6: Local Projections: Horizon-Specific Effect of DGPR (β_h), Selected Horizons (HAC)

Horizon	Model 1	Model 2	Model 3	Model 4
h=0	-1.704 (-0.83)	-1.619 (-0.83)	-1.625 (-0.84)	-2.107 (-1.15)
h=1	-1.712 (-0.82)	-1.651 (-0.83)	-1.694 (-0.86)	-2.470 (-1.37)
h=3	-1.663 (-0.78)	-1.660 (-0.81)	-1.728 (-0.85)	-2.743 (-1.50)
h=6	-2.244 (-1.05)	-2.302 (-1.11)	-2.374 (-1.16)	-3.158* (-1.74)
h=12	-5.836*** (-2.64)	-5.814*** (-2.68)	-5.908*** (-2.80)	-5.807*** (-2.69)

Notes: Table entries report coefficient estimates with t-statistics in parentheses. Significance levels are denoted as *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$. Standard errors are computed using HAC/Newey–West estimators (Newey and West, 1987).

Table 6 shows that, while the estimated effect of DGPR is weak at short horizons (h = 0–3), it becomes increasingly negative as the horizon lengthens and, importantly, turns statistically significant at h = 12 across all control blocks. This pattern indicates that geopolitical risk shocks may affect market returns not only instantaneously but also through delayed and potentially cumulative mechanisms. The fact that the h = 12 effect does not disappear when moving from Model 1 to Model 4 suggests that the long-horizon impact is not fully explained by global risk appetite (DVIX) or by the other macro-financial channels included in the extended specifications.

From a financial theory perspective, the results are consistent with a time-varying discount-rate channel. An increase in geopolitical risk may trigger a contemporaneous rise in risk aversion. Still, it may also deteriorate expectations regarding investment and capital flows, leading to a more persistent increase in risk premia and discount rates and, consequently, to a delayed negative effect on returns. The magnitude of the coefficient at h = 12 supports the interpretation that the pricing of geopolitical risk can be gradual. Nevertheless, LP estimates remain conditional on the maintained specification, and alternative channels (e.g., attention/salience or cash-flow expectations) cannot be ruled out.

The stability of the h = 12 estimates across Models 1–4 further implies that geopolitical risk may carry an independent long-horizon component beyond the co-movement with global uncertainty, exchange-rate dynamics, commodity shocks, or inflation. At the same time, because the effect is horizon-dependent, alternative transmission mechanisms remain plausible, including delayed market attention/interpretation (sentiment and salience channels) and the transmission of geopolitical events to expected cash flows through real-economy conditions. To provide a system-level consistency check, the analysis next implements a VAR-based impulse response framework. The lag length is selected using the BIC criterion (p = 1) (Sims, 1980), and orthogonalised responses are reported under an ordering in which DGPR precedes RET (DGPR → … → RET).

Table 7: VAR (p = 1) IRF: Response of RET to a DGPR Shock (Cholesky), 95% Confidence İntervals

Horizon (h)	Model 1	Model 2	Model 3	Model 4
0	-0.0667	-0.0640	-0.0569	-0.0561
	[-0.2129,0.0716]	[-0.2126,0.0639]	[-0.2031,0.0802]	[-0.1998,0.0833]
1	0.0641	0.0640	0.0669	0.0707
	[-0.0733,0.2106]	[-0.0740,0.1956]	[-0.0749,0.2035]	[-0.0611,0.2297]
3	0.0051	0.0044	0.0029	0.0053
	[-0.0057,0.0241]	[-0.0084,0.0239]	[-0.0092,0.0211]	[-0.0119,0.0271]
6	-0.0001	-0.0001	-0.0000	-0.0000
	[-0.0018,0.0001]	[-0.0015,0.0007]	[-0.0014,0.0007]	[-0.0022,0.0023]
12	-0.0000	0.0000	0.0000	0.0000
	[-0.0000,0.0000]	[-0.0000,0.0000]	[-0.0000,0.0000]	[-0.0000,0.0001]

Notes: Table 7 reports impulse response function (IRF) point estimates from the VAR (p = 1) model, with 95% confidence intervals in brackets. IRFs are obtained via Cholesky orthogonalisation under the ordering DGPR → (controls) → RET. Confidence intervals are computed using a bootstrap/Monte Carlo procedure with B = 2,000 replications. Confidence intervals that include zero indicate that the response is not statistically distinguishable from zero at the corresponding horizon.

Table 7 reports VAR-based impulse responses of RET to an orthogonalised DGPR shock. The sign of the response varies at short horizons, and the 95% confidence intervals include zero for most horizons across all model configurations. Taken together, these results indicate that, within the VAR(p = 1) framework, the response of equity returns to a DGPR shock is not estimated with sufficient precision to be statistically distinguishable from zero at conventional confidence levels. Accordingly, the VAR evidence is best interpreted not as a primary source of identification, but as a complementary system-level robustness check alongside the dynamic regression and Local Projections results.

Two features of the VAR results merit emphasis. First, the short-horizon sign changes highlight the sensitivity of VAR-based IRFs to orthogonalisation and ordering assumptions, especially in settings where DGPR may co-move with global uncertainty proxies such as DVIX. Under the maintained ordering DGPR → (controls) → RET, the contemporaneous (h = 0) response is negative, which is consistent with an immediate risk-off reaction; however, the positive response at h = 1 and the subsequent rapid attenuation underscore that, in a low-lag VAR, short-run contemporaneous interactions can generate offsetting dynamics. Second, the absence of a pronounced long-horizon response in the VAR—responses converge toward values close to zero—contrasts with the statistically significant negative effect at h = 12 obtained under Local Projections. This divergence is plausible because the VAR specification (with p = 1) and Cholesky identification primarily capture short-run system dynamics and may dampen longer-horizon effects. In contrast, Local Projections are designed to estimate horizon-specific responses more flexibly. Therefore, we treat the LP profile as the main evidence of horizon-dependence, and the VAR as a consistency check of short-run system propagation.

Importantly, as the control blocks expand from Model 1 to Model 4, the IRF profile does not exhibit abrupt structural reversals, which provides a modest indication of system-level consistency. Overall, the combined evidence suggests that interpreting geopolitical risk shocks as producing a sharp, one-period return response is difficult; instead, their impact may be regime- and horizon-dependent, potentially materialising gradually through expectation formation and risk-premium dynamics. In this sense, the Local Projections results constitute the primary evidence of longer-horizon effects. At the same time, the VAR serves as a supplementary check on co-movement and short-run propagation within a multivariate system.

Overall, the findings suggest that interpreting the impact of geopolitical risk shocks on Turkish equity returns as an "instantaneous" reaction confined to a single period is difficult; rather, the effect emerges over time as uncertainty accumulates through the risk-premium channel. Although the sign of geopolitical risk remains negative in short-run average effects—consistent with a risk-off expectation—the failure of this effect to separate statistically in a strong manner is consistent with factors such as the heterogeneous nature of geopolitical events (intensity, duration, the degree of market attention, and the density of news flows) and the entanglement of such events with the prevailing global risk conditions at the outset. By contrast, the strong and persistent effect of the uncertainty indicator representing global risk appetite suggests that the global risk regime often shapes pricing in emerging markets; geopolitical risk may then operate on top of, or interact with, this regime, with effects that may manifest with a delay.

Preserving the direction of results as the set of control variables expands implies that geopolitical risk should not be viewed merely as a "reflection" of macro-financial channels such as exchange rates, commodities, or inflation; at least over longer horizons, it may contain an independent component. The positive co-movement between inflation changes and returns further suggests that, during the sample period, nominal pricing and portfolio rebalancing mechanisms may have become dominant in certain regimes, and that in economies with a high-inflation experience such as Türkiye, equity returns may at times exhibit a "nominal hedge"-like pattern. Finally, signals of time-varying and conditionally heteroskedastic error variance are consistent with the volatility clustering commonly observed in financial returns, underscoring the importance of using a robust standard-error framework for reliable inference. Taken together, this holistic picture provides a coherent narrative in which the effect of geopolitical risk may appear weak in the short run, yet can strengthen over time through uncertainty perceptions and risk-premium dynamics. To complement these system-level results with an intuitive visual diagnostic, we next examine the unconditional association between DGPR and DVIX over the full sample period. This descriptive step is particularly informative because a non-trivial DGPR–DVIX co-movement implies that geopolitical risk shocks often occur under a broader global uncertainty regime, which may attenuate or offset short-run return responses in a low-lag VAR while remaining relevant for longer-horizon pricing dynamics. Accordingly, we introduce Figure 1.

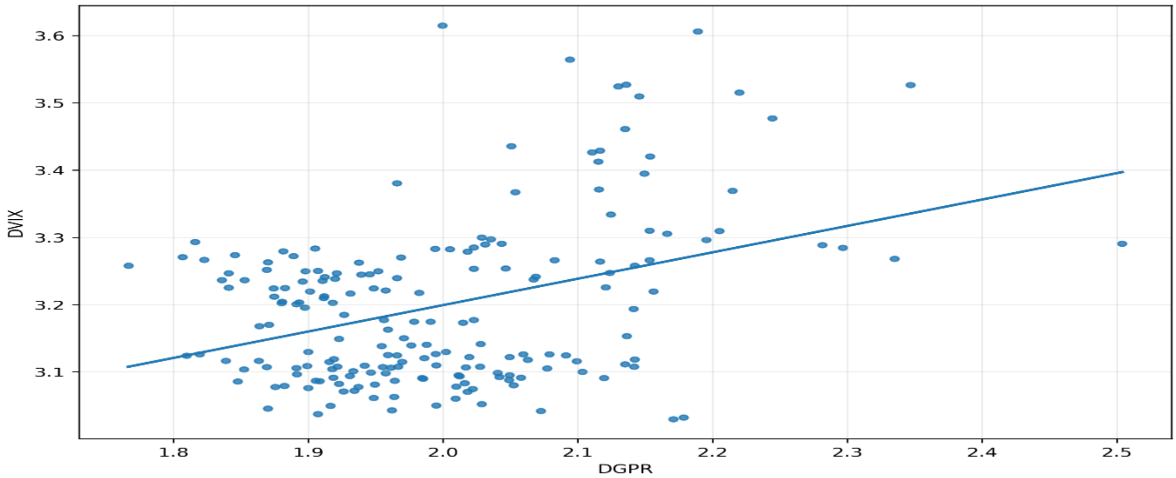

Figure 1: DGPR–DVIX association: scatter plot with fitted linear trend (2010:01–2025:11)

Figure 1 plots monthly observations of DGPR (x-axis) against DVIX (y-axis). The fitted linear trend indicates a moderate positive association between geopolitical risk and global uncertainty conditions in the sample: higher DGPR readings tend to coincide with higher DVIX levels. At the same time, the dispersion of observations around the trend line highlights meaningful cross-month heterogeneity, consistent with variation in event intensity, news salience, and the prevailing global risk regime. Overall, Figure 1 provides visual support for interpreting geopolitical risk as operating partly through (and in interaction with) the global uncertainty environment, which helps rationalise why VAR-based short-horizon IRFs can appear weak or imprecise even when longer-horizon effects emerge in more flexible horizon-specific estimates.

Conclusion and recommendations

The main conclusion of this study is that, although geopolitical risk shocks exhibit weak separation in terms of short-run average effects in the Turkish stock market, the global uncertainty channel (VIX)—which shapes the prevailing risk regime—exerts a strong and systematic downward pressure on returns. In the dynamic regression results, the DGPR coefficient remains negative across all specifications, providing directional evidence consistent with the theoretical expectation that increases in geopolitical risk operate in a risk-off manner. However, the absence of statistical significance in the same month suggests that geopolitical risk shocks do not transmit to market prices through an instantaneous, uniform mechanism. This finding is consistent with the expectation that heterogeneous pricing may arise depending on event intensity, the process of expectation formation, the speed and intensity of news diffusion, and contemporaneous global risk conditions. The evidence further implies that the effects of geopolitical risk may operate less through a short-horizon mean-return channel and more through a delayed mechanism driven by persistent uncertainty perceptions and the repricing of risk premia. In this sense, geopolitical risk may behave as an "uncertainty shock" that affects valuations primarily through the discount-rate/risk-premium channel rather than directly through expected cash flows, thereby spreading its impact over time. This interpretation aligns with the broader GPR literature, which emphasises that geopolitical risk is closely tied to uncertainty and risk perceptions, and that contemporaneous mean-return effects can be fragile relative to volatility/uncertainty responses (Caldara & Iacoviello, 2022; Salisu et al., 2022; Zhang et al., 2023). In particular, our finding of a consistently negative but statistically weak same-month DGPR coefficient is consistent with studies showing that return effects may depend on horizon and specification and may not separate cleanly in contemporaneous average-return regressions (Ma et al., 2022). Importantly, it also aligns with the Türkiye-focused literature, which emphasises that the strength and detectability of GPR effects depend on the empirical design, sample period, and the information set used for identification (Üçler & Özşahin, 2020; Ceyhan, 2025; Iltas, 2020; Nazlıoğlu, 2025). In particular, studies employing system-based or causality-oriented designs caution that conclusions may vary with specification and identification choices. This insight helps rationalise why a same-month average-return effect may not cleanly separate once global risk factors are accounted for.

By contrast, the strong, negative, and highly significant DVIX estimates from Model 2 onward indicate that Turkish equity returns are highly sensitive to fluctuations in global risk appetite. Consequently, controlling for the global uncertainty regime appears necessary for a reliable assessment of the market impact of geopolitical risk shocks. This result also suggests that a substantial portion of the variation associated with geopolitical risk may co-move with a "common shock" component embedded in global risk conditions; hence, without an expanded control set, the DGPR coefficient may be biased or fragile. More broadly, the evidence supports the view that asset pricing in emerging markets is often driven by global risk-premium conditions, with geopolitical risk acting at times as a secondary shock that either amplifies the intensity of the global regime or interacts with local vulnerabilities. For this reason, isolating contemporaneous global uncertainty shocks is critical when searching for an "independent effect" of geopolitical risk. This finding closely matches both the international emerging-markets narrative (Bekaert & Harvey, 2000) and the domestic Türkiye evidence, which highlight the importance of global conditions and model specification for interpreting GPR–BIST linkages (Ceyhan, 2025; Üçler & Özşahin, 2020). In other words, the dominant short-run role of global risk appetite documented here provides a coherent explanation for why some Türkiye studies report mixed or specification-sensitive return effects: when global risk regimes are not carefully separated, the incremental pricing impact of GPR may be confounded by a broader global uncertainty component.

The positive and significant coefficient on DCPI in Model 4 indicates that, during the sample period, there were regimes in which inflation shocks co-moved positively with equity returns. This finding suggests that the impact of inflation on financial assets is neither unidirectional nor time-invariant, and is consistent with an environment in which increases in nominal magnitudes may, in certain periods, be transmitted to equity returns through expected cash flows, pricing power, or nominal valuation dynamics. Nevertheless, a regime-dependent perspective is essential for interpreting this relationship, as the market impact of inflation shocks can vary with the monetary policy response, the risk premium channel, and exchange rate pass-through. In an economy with a pronounced inflation experience such as Türkiye, the result also raises the possibility that equities may at times display a "nominal hedge"-like profile; however, identifying the conditions under which this co-movement strengthens—e.g., under different monetary policy stances, exchange-rate regimes, or episodes of financial dominance—remains an important topic for future work. This interpretation is also consistent with the Türkiye-oriented empirical work that often stresses regime dependence and heterogeneity across periods and sectors in macro-financial relationships, implying that nominal variables can interact with equity pricing in non-linear ways rather than through a single stable channel (Irmak, 2025; Bulut et al., 2023).

Diagnostic tests indicate that, in some specifications, BP and ARCH results point to heteroskedasticity and conditional variance dynamics in the residuals. This is a standard feature of financial series, making it methodologically necessary to conduct inference using HAC/Newey–West standard errors. Interpreting statistical significance under this robust inference framework, the strong effect of DVIX remains highly robust. In contrast, the lack of short-run statistical separation for DGPR should be viewed not as a "chance" finding but as consistent with the sample's underlying dynamic structure.

From a policy and market-monitoring perspective, the results indicate that the most powerful external driver of the Turkish equity market during risk-off episodes is global uncertainty, and that geopolitical risk shocks may not always leave a clear pricing imprint in the same month. Accordingly, the evidence suggests that geopolitical risk indicators are more informative when assessed jointly with the prevailing global risk regime (VIX) and domestic macro-financial conditions (exchange rate, inflation, and commodity shocks), rather than interpreted as stand-alone "instant signals." Moreover, the horizon-dependent pattern documented in the Local Projections is consistent with the possibility that the pricing of geopolitical risk unfolds gradually, suggesting that relevant adjustments may extend beyond the contemporaneous month. This interpretation is also consistent with Türkiye-focused evidence that emphasises delayed, perception-driven transmission to financial segments and sector indices (Ceyhan, 2025; Erzurumlu & Akçakanat, 2025). Given the monthly frequency and the reduced-form nature of the estimates, these implications should be interpreted as monitoring-relevant considerations rather than as causal guidance for specific policy interventions.

Beyond the policy implications, the study contributes to the literature by clarifying that the pricing of geopolitical risk in monthly equity returns may be primarily horizon-dependent rather than purely contemporaneous. Specifically, while DGPR does not separate strongly in same-month mean regressions, Local Projections reveal a statistically significant and economically meaningful negative effect at longer horizons (notably $h = 12$), indicating delayed and cumulative adjustment. Moreover, the persistence of the long-horizon DGPR effect across progressively richer specifications shows that this pattern cannot be fully attributed to global risk appetite or other macro-financial channels, thereby providing a more transparent assessment of the incremental role of geopolitical risk under alternative conditioning information sets. Taken together, these results offer a unifying explanation for why Türkiye-focused studies can report mixed contemporaneous effects: when global risk regimes are not transparently separated, short-run DGPR effects may appear fragile even though longer-horizon responses remain detectable.

Finally, the findings highlight two directions for future research. First, because the effect of geopolitical risk is likely heterogeneous across event types and intensity, re-estimating the analysis for "high-intensity" DGPR shocks or under an event-classification framework may strengthen inference. Second, the pattern of weak short-run effects and stronger longer-horizon responses underscores the possibility that geopolitical risk operates through an accumulating transmission mechanism; modelling intermediary channels—such as local risk premia (e.g., CDS), exchange-rate volatility, or capital flows—may therefore provide a more informative account of the geopolitical risk–market linkage.

Despite these contributions, the study has several limitations that should be acknowledged. First, the analysis relies on monthly data, which may smooth within-month market reactions and obscure high-frequency adjustment dynamics around geopolitical events. Second, although we employ a sequential control strategy and robust inference, endogeneity and identification challenges may remain because geopolitical risk, global uncertainty, and domestic macro-financial conditions can co-move and respond jointly to common shocks. Third, some results—especially those related to DGPR—may be sensitive to model specification choices (e.g., lag structure, ordering assumptions in VAR orthogonalisation, and the selected set of controls) as well as to alternative measures of risk and uncertainty. Future research could address these limitations by using higher-frequency data (daily/intraday), exploring alternative identification strategies and instruments, and testing robustness across different proxies, regimes, and sector-level specifications.

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