



## Geopolitical risk and corporate payout policy

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### ABSTRACT

In this study, we examine the effects of geopolitical risk on corporate payout policy. Exploiting a news-based index of geopolitical risk, we find that firms adopt a more conservative payout policy by reducing share repurchases in response to greater geopolitical risk, whereas the effects of geopolitical risk on cash dividends are insignificant. Further analysis suggests that cash flow uncertainty and financial distress risk are two potential channels through which geopolitical risk affects corporate payout policy. We also show that the effects of geopolitical risk on share repurchase are more pronounced for firms with greater exposure to product market competition and those facing higher threats of financial distress. Overall, our study emphasizes the implications of geopolitical risk for corporate payout choice.

### 1. Introduction

Geopolitical risk is a highly significant contributor to uncertainty. This risk, together with economic and policy uncertainty, forms an ‘uncertainty trinity’ that has a negative effect on economic activity (e.g., Bekaert, Harvey, Lundblad, & Siegel, 2014; Butler & Joaquin, 1998; Caldara & Iacoviello, 2022; Carney, 2016). Geopolitical risk is defined as “the risk associated with wars, terrorist acts, and tensions between states that affect the normal and peaceful course of international relations” (Caldara & Iacoviello, 2022, p. 1197), which is distinct from other types of uncertainty and weaker economic conditions.<sup>1</sup> This is because geopolitical uncertainty is primarily induced by adverse events related to wars, terrorist acts, and tensions that take place outside the US, but which can still negatively affect the economic activity in the US itself (Caldara & Iacoviello, 2022). Motivated by a series of adverse geopolitical events, such as the Gulf War, the 9/11 terrorist attacks, the 2003

invasion of Iraq, and the Russian invasion of Ukraine, a growing body of literature is providing rich insights into the real effects of geopolitical risk at both the macro and micro levels.<sup>2</sup> However, research into the economic consequences of geopolitical risk for corporate financing decisions is sparse. In this study, we contribute to filling this important research gap by investigating the effects of geopolitical risk on corporate payouts in the form of cash dividends and share repurchases.

Previous studies suggest that firms suffering from cash flow shortfalls are more likely to rely on internal financing, as it is much less costly than external sources of finance (Hennessy & Whited, 2007; Myers, 1977; Myers & Majluf, 1984). Reductions in payouts to shareholders are known to be one of the most important sources of internal financing (Brav, Graham, Harvey, & Michaely, 2005; Chay & Suh, 2009; Lintner, 1956). Cash dividends and share repurchases are two main forms of corporate payout, and firms have gradually substituted repurchases for cash dividends when paying out cash flow to shareholders over recent

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<sup>1</sup> For example, economic uncertainty is related to an unpredictable outlook for the economy, which could involve inflation uncertainty, recessions, concerns over unemployment, and so on. Economic policy uncertainty is related to uncertainty induced by country-specific economic policies, such as national security, medical care, and monetary, fiscal, trade, and other related policies. Furthermore, political uncertainty is defined as governments’ future actions, such as gubernatorial elections, immigration laws, government subsidies and so forth (Pástor & Veronesi, 2012).

<sup>2</sup> At the macro level, previous studies show that geopolitical risk negatively affects global capital flow (Butler & Joaquin, 1998), financial market stability (Pástor & Veronesi, 2013), oil markets (Bouoiyour, Selmi, Hammoudeh, & Wohar, 2019), green bond markets (Lee, Lee, & Li, 2021), and so forth. At the micro level, Caldara and Iacoviello (2022) emphasize the effects of geopolitical risk on corporate investment and employment.

decades (e.g., Grullon & Michaely, 2002, 2004; Haw, Ho, Hu, & Zhang, 2011; Skinner, 2008; Von Eije & Megginson, 2008).<sup>3</sup> The flexibility of share repurchase schemes could explain why share repurchases became the dominant form of payout, especially for firms with greater exposure to external credit shocks (Bliss, Cheng, & Denis, 2015; Jagannathan, Stephens, & Weisbach, 2000). More specifically, cash dividends are sticky and used to distribute permanent cash flow to shareholders. In contrast, share repurchases do not represent an ongoing commitment and are utilized to distribute temporary cash flow to shareholders (Jagannathan et al., 2000). Therefore, whether, and to what extent, firms alter their decisions with regard to distributing cash flow and make a payout choice between cash dividends and share repurchases in response to higher geopolitical uncertainty is of empirical concern in this study.

We conjecture that geopolitical risk may affect corporate payouts based on two opposite views. The first view predicts that higher geopolitical risk is associated with fewer corporate payouts. This prediction is based on the argument that geopolitical risk can heighten cash flow uncertainty and increase financial distress risk in two possible ways. On the one hand, previous studies show that geopolitical conflicts lower stock returns and heighten capital market volatility (Bloom, 2009; Brounen & Derwall, 2010; Chesney, Reshetar, & Karaman, 2011), which leads to greater cash flow uncertainty. Furthermore, previous studies provide both theoretical and empirical evidence to suggest that uncertainty induced by adverse geopolitical events is associated with a dramatic drop in productivity, output, or sales volume (Abadie & Gardeazabal, 2003; Abadie & Gardeazabal, 2008; Bloom, 2009; Caldara & Iacoviello, 2022). Along these lines, a reduction in productivity or sales volume resulting from geopolitical uncertainty could further heighten cash flow risk. On the other hand, the increased uncertainty induced by adverse geopolitical events can cause external financing costs to rise (Francis, Hasan, & Zhu, 2014; Pástor & Veronesi, 2012, 2013), resulting in a tightening of financial constraints (Greenwald & Stiglitz, 1990), thereby leading to higher levels of financial distress risk. Therefore, firms with higher cash flow uncertainty and greater risk of financial distress are more likely to be reliant on internal funds and, therefore, to distribute less wealth to shareholders (Arena & Julio, 2023; Bliss et al., 2015; Brav et al., 2005; Chay & Suh, 2009; Lintner, 1956).

The second view maintains that greater geopolitical risk is associated with more extensive corporate payouts. This prediction is based on the rent extraction channel, which argues that greater uncertainty induced by adverse geopolitical events may lead firms to delay or reduce investment (Caldara & Iacoviello, 2022; Wang, Wu, & Xu, 2019),<sup>4</sup> which is associated with more excessive cash reserves, thereby increasing the agency cost of free cash flow and resulting in the transfer of wealth from shareholders to managers (Easterbrook, 1984; Fluck, 1999; Jensen, 1986; Myers, 2000; Zwiebel, 1996). Along this line of reasoning, in order to constrain managers from rent extraction or extracting private benefits through expropriating free cash flows during a period of high geopolitical uncertainty, firms have greater incentives to pay more of the cash flow to shareholders. Collectively, given the two competing views, the effect of geopolitical risk on corporate payouts is ambiguous ex ante, and hence needs to be empirically investigated.

We expect the impact of geopolitical risk on corporate payouts to be more manifested in share repurchase schemes for the following reasons.

<sup>3</sup> According to data from Compustat, the ratio of share repurchase expenditure over total earnings increased from 4.8% in 1985 to 47.4% in 2019.

<sup>4</sup> Real options theory argues that irreversible investments are equivalent to financial call options that can be either exercised or delayed at any time. Higher uncertainty increases the value of the option to 'wait and see', thereby delaying or reducing firms' capital investment (Abel & Eberly, 1996; Adra, Barbopoulos, & Saunders, 2020; Bernanke, 1983; Bertola & Caballero, 1994; Bonaime, Gulen, & Ion, 2018; Gulen & Ion, 2016; Kang, Lee, & Ratti, 2014; Myers & Rajan, 1998).

First, cash dividend payments are sticky and provide a signal about a firm's long-term profitability (Jagannathan et al., 2000; Moyn, 2004). Since reductions in cash dividends are associated with negative stock market reaction (DeAngelo, DeAngelo, & Skinner, 2004; Denis, Denis, & Sarin, 1994; Ghosh & Woolridge, 1988; Lintner, 1956; Maxwell & Stephens, 2003; Yoon & Starks, 1995), managers have strong incentives to maintain the current level of cash dividend payments and are reluctant to reduce cash dividend payments (Brav et al., 2005; Guay & Harford, 2000; Jagannathan et al., 2000; Leary & Michaely, 2011). Second, a share repurchase scheme is more discretionary and does not involve long-run commitments to make future distributions (Fenn & Liang, 2001; Grullon & Michaely, 2004; Jagannathan et al., 2000; Zhang, 2005). Therefore, firms can adjust the amount of share repurchases more quickly than cash dividends to navigate the uncertainty arising from temporary external shocks (Bliss et al., 2015; Chu, 2018; Dang, De Cesari, & Phan, 2021; Ni, Song, & Yao, 2020; Skinner, 2008). Given that adverse geopolitical events, particularly terrorist attacks, take place sporadically, this further emphasizes that the cash flow implications of geopolitical risk are highly uncertain and temporary (Brounen & Derwall, 2010; Chesney et al., 2011; Goel, Cagle, & Shawky, 2017).

Our empirical analysis is based on the US market, since the United States plays a dominant role in determining global politics (Pease, 2000). The key to the US dominance of the world economy is the development of both state-level political economy and global-level geopolitical economy (Desai, 2013). Although US geopolitical dominance enables the economy of the United States to grow and to become more integrated into the global economy, it comes at significant cost because US firms are increasingly exposed to rising political tensions, threats of war, and terrorism acts around the world. For example, the involvement of the United States in major geopolitical shocks, such as the Gulf War, the 9/11 terrorist attacks, and the 2003 Iraq War, adversely affected US firms and led them to pay increasing attention to these events (Hao, Prapan, Gavriilidis, Petmezas, & Vagenas-Nanos, 2020). Accordingly, the US market provides an ideal setting to explore the influence of geopolitical risk on corporate behaviour.

Following previous studies of geopolitical risk (e.g., Caldara & Iacoviello, 2022; Hao et al., 2020), we utilize a news-based index of geopolitical risks to investigate the effects of such risks on corporate payout policy. From a sample of 12,883 US listed firms across the period 1985–2019, representing 116,694 firm-year observations, we find that firms adopt a more conservative payout policy by reducing share repurchases in response to higher geopolitical risk, whereas the effects of such risks on cash dividends are statistically insignificant. Importantly, our results document that a one standard deviation increase in our *Geopolitical Risk* variable of interest decreases share repurchases by approximately 0.0011 units ( $= -0.0040 \times 0.277$ ), amounting to 7.9% of the sample mean. Therefore, the negative relationship between geopolitical risk and share repurchase is both statistically and economically material.

We also adopt a battery of robustness tests to demonstrate that the effects of geopolitical risk on share repurchase are causal. More specifically, we exploit an instrumental variable – the *Religious Tension Index* constructed by the International Country Risk Guide (ICRG) – to circumvent potential biases induced by omitted variables. Although this instrumental variable has been shown to be plausibly and empirically correlated with geopolitical risk (Agnew, 2006), it has no direct connection to corporate payout policy. Furthermore, we adopt a firm fixed effect model to control the effects of time-invariant unobservable firm-specific heterogeneity. Finally, the results are also robust to alternative measures of geopolitical risk, in the form of *Geopolitical Threats* and *Geopolitical Acts*, and different measures of share repurchases. Therefore, we can conclude, beyond reasonable doubt, that we are able to demonstrate that geopolitical risk has a causal effect on share repurchases. These findings support the argument that higher geopolitical risk is associated with greater cash flow uncertainty and financial distress risk, thereby motivating firms to adopt a more conservative

corporate payout policy by reducing share repurchases.

We also investigate the potential economic mechanisms through which geopolitical risk affects corporate payout policy. The results show that firms facing higher levels of geopolitical risk have greater stock return volatility and cash flow uncertainty, and more exposure to financial distress risk, providing richer insights into the notion that cash flow uncertainty and financial distress are two potential channels through which geopolitical risk alters corporate payout decisions. Finally, we perform cross-sectional analyses to examine firm heterogeneity in terms of the effect of geopolitical risk on share repurchases. More specifically, we investigate whether and how the effect of geopolitical risk on share repurchases varies among firms facing different degrees of product market competition and those exposed to heterogeneous financial distress threats. If the negative effect of geopolitical risk on share repurchases is driven by the cash flow uncertainty and financial distress risk channel, we would expect to document a more pronounced effect for firms operating in more competitive product markets and those that are close to default, as these firms are more vulnerable to cash flow uncertainty and financial distress and rely more on internal financing sources by reducing payouts to shareholders. These findings are supported.

Our study makes contributions to two strands of the literature. First, we contribute to the literature on conventional economic theory concerning the economic consequences of geopolitical risk (Abadie & Gardeazabal, 2008; Bloom, 2009; Butler & Joaquin, 1998). In particular, Bloom (2009) built a structural model to show that adverse geopolitical events and threats have significant adverse economic effects, such as a dramatic drop in output, productivity, and employment. More recently, a growing body of literature emphasizes the relevance of geopolitical risk to corporate investment activity, including innovation input, capital investment, and acquisition activity (Caldara & Iacoviello, 2022; Hao et al., 2020; Pan, 2019; Wang et al., 2019). We contribute to this strand of the literature by providing novel evidence to suggest that geopolitical risk has significant implications for corporate financing decisions.

Second, our study affords greater insights into the determinants of corporate payout policy. Signalling theory suggests that cash dividend payments provide a signal about a firm's profitability (John & Williams, 1985; Miller & Rock, 1985). One strand of the literature shows that firms would rather decrease investment than cut cash dividends, as reductions in cash dividends send a negative signal about future profitability to capital market participants (e.g., Denis et al., 1994; Ghosh & Woolridge, 1988; Lintner, 1956; Yoon & Starks, 1995). Our study complements this line of the literature and suggests that firms are reluctant to cut cash dividends in response to higher geopolitical risk, providing useful insights into the argument that cash dividends are sticky and less likely to be used for internal financing when firms are exposed to temporary cash flow shocks. Furthermore, our study also adds to a growing body of literature on share repurchase schemes (Grullon & Michaely, 2002, 2004; Haw et al., 2011; Skinner, 2008; Von Eije & Megginson, 2008). More specifically, previous studies demonstrate that share repurchase schemes are a more flexible and effective tool for navigating uncertainty induced by external shocks, such as financial crises (Bliss et al., 2015), exogenous shocks to firms' debt capacity (Kumar & Vergara-Alert, 2020), and wrongful discharge laws (Dang et al., 2021). We extend this strand of the literature and show that geopolitical risk plays an essential role in shaping firms' share repurchase decisions.

In a related study, Huang, Wu, Yu, and Zhang (2015) investigate the effects of global political crises on cash dividend payments. Our study differs from theirs in the following respects. Huang et al. (2015) find that firms reduce cash dividend payments in response to higher global political risk, whereas our study shows that firms are likely to reduce share repurchases rather than cash dividends to navigate geopolitical uncertainty. This is in line with the signalling theory that cash dividend payment provides a signal about a firm's profitability, and corporate managers are reluctant to reduce cash dividends in order to avoid a negative capital market reaction (John & Williams, 1985; Miller & Rock,

1985). Furthermore, our findings also emphasize the flexibility of share repurchases scheme in response to higher geopolitical risk, which explains why firms gradually substitute share repurchases for cash dividends (Grullon & Michaely, 2002, 2004; Haw et al., 2011; Skinner, 2008; Von Eije & Megginson, 2008).

Practically, our study provides valuable information for entrepreneurs, market participants, and central bank officials. The Bank of England includes geopolitical risk, together with economic and policy uncertainty, among an "uncertainty trinity" (Carney, 2016), as it plays an essential role in determining investment decisions and capital market dynamics. We further provide richer insights into the implications of geopolitical risks for corporate financing decisions. In particular, we show that share repurchase schemes can, to a great extent, help firms navigate geopolitical uncertainty.

The remainder of this paper is organized as follows. Section 2 develops the hypothesis. Section 3 describes the data and sample. Section 4 shows the empirical design. Section 5 discusses the empirical results. Section 6 discusses and concludes the paper.

## 2. Hypothesis development

In this section, we develop two competing predictions on the relationship between geopolitical risk and corporate payouts. The first prediction is based on the argument that geopolitical risk can heighten cash flow uncertainty and increase financial distress risk, which is associated with fewer corporate payouts. Conventional economic theory shows that adverse geopolitical events dramatically increase uncertainty, which could negatively affect the real economy (Abadie & Gardeazabal, 2008; Bloom, 2009; Butler & Joaquin, 1998). In particular, Butler & Joaquin's (1998) theoretical model shows that geopolitical risk is an important source of systematic risk and increases equity volatility. Recent empirical studies provide supportive evidence to suggest that adverse geopolitical events significantly heighten capital market volatility (Brounen & Derwall, 2010; Chesney et al., 2011), leading to greater cash flow uncertainty. Furthermore, Bloom (2009) built a structural model to show that uncertainty induced by adverse geopolitical events leads to a rapid and dramatic drop in output, productivity, and employment. In their example, Abadie and Gardeazabal (2003) document that the outbreak of terrorist attacks was associated with a decline of more than 10 percentage points in Basque Country GDP per capita. Abadie and Gardeazabal (2008) also provide both empirical and theoretical evidence to suggest that adverse geopolitical events lead to lower global investment. Along these lines, the reduction in firms' productivity arising from geopolitical uncertainty could further heighten cash flow uncertainty. On the other hand, recent theoretical studies also suggest that investors in capital markets are likely to require higher risk premia in uncertain political environments, which is associated with an increased cost of equity capital (Pástor & Veronesi, 2012, 2013). Francis et al. (2014) show that firms with greater exposure to uncertainty are associated with a higher cost of bank loans. Increased external financing costs could result in a tightening of financial constraints (Greenwald & Stiglitz, 1990), thereby leading to higher levels of financial distress risk. Therefore, firms with greater exposure to geopolitical risk may suffer threats of greater financial distress.

The literature shows that internal financing is less costly than external funding for firms with cash flow shortfalls (Hennessy & Whited, 2007; Myers, 1977; Myers & Majluf, 1984). Therefore, firms with higher cash flow uncertainty and greater risk of financial distress are more likely to be reliant on internal funds, and, therefore, to distribute less wealth to shareholders (Arena & Julio, 2023; Bliss et al., 2015; Brav et al., 2005; Chay & Suh, 2009; Lintner, 1956). In particular, the adoption of a conservative payout policy by distributing less wealth to shareholders can, to a great extent, help firms navigate cash flow uncertainty (Chay & Suh, 2009), provide financial flexibility in response to product market threats (Hoberg, Phillips, & Prabhala, 2014), maintain financial stability during a period of financial crisis (Bliss et al., 2015),



and mitigate financial constraints (Kumar & Vergara-Alert, 2020). Based on the above arguments, we conjecture that firms are likely to reduce corporate payouts in response to greater geopolitical risk.

However, a competing prediction is based on arguments relating to managerial rent extraction, which maintain that greater uncertainty induced by higher geopolitical risk may lead to the transfer of wealth from shareholders to managers. More specifically, real options theory suggests that firms with greater exposure to uncertainty are likely to delay or reduce their capital investment and, therefore, increase their cash reserves (Abel & Eberly, 1996; Bernanke, 1983; Bertola & Caballero, 1994; Bonaime et al., 2018; Gulen & Ion, 2016; Kang et al., 2014; Myers & Rajan, 1998), which, in turn, exacerbates the agency problem relating to free cash flow. In particular, firms are likely to reduce capital investment and employment in response to greater geopolitical uncertainty (Caldara & Iacoviello, 2022; Wang et al., 2019), which is associated with greater free cash flow.

Agency theory suggests that the payout of free cash flow to shareholders can constrain managerial rent extraction and protect shareholder wealth (Jensen, 1986). Previous studies emphasize that the payout of free cash flow is an effective method of aligning managers' interests with those of shareholders (Easterbrook, 1984; Fluck, 1999; Jensen, 1986; Myers, 2000; Zwiebel, 1996). Therefore, to discourage managers from diverting corporate resources or extracting private benefits through expropriating free cash flows during a period of high geopolitical uncertainty, firms have greater incentives to distribute cash flows to shareholders by increasing corporate payouts.

Between cash dividends and share repurchases, we argue that the effects of geopolitical risk on corporate payouts are primarily driven by share repurchase schemes for at least two reasons. First, corporate managers always have a strong commitment to maintaining the current level of cash dividend payments and, therefore, seek to avoid a negative market reaction induced by reductions in cash dividends (Brav et al., 2005; Guay & Harford, 2000; Jagannathan et al., 2000; Leary & Michaely, 2011). Since cash dividends are sticky and are used to distribute permanent cash flow to shareholders, reductions in cash dividends provide a negative signal about a firm's future prospects to capital market participants and tend to prompt negative price reactions in stock markets (Denis et al., 1994; Ghosh & Woolridge, 1988; Lintner, 1956; Yoon & Starks, 1995). Second, share repurchases do not represent an ongoing commitment and are typically paid for out of temporary cash flow (Jagannathan et al., 2000), which gives firms greater flexibility and speed in adjusting share repurchases than would be the case for adapting cash dividends in response to external shocks (Bliss et al., 2015; Chu, 2018; Dang et al., 2021; Ni et al., 2020; Skinner, 2008), especially when the cash flow implications of external shocks are highly uncertain and temporary. A further consideration is that share repurchases could also be a signal that managers feel that shares are undervalued. However, Floyd, Li, and Skinner (2015) suggest that share repurchase schemes do not involve a long-run commitment and are, therefore, less useful as signals. This is because changes in dividends per share are easy to observe and are widely reported, which means that dividends serve as reference points for investors (Baker, Mendel, & Wurgler, 2016). It is more difficult to track changes in amounts of repurchases per share. As the magnitude of repurchases could not be tied to a specific period, and, in many instances, a repurchase is announced and then implemented over two to three years, this makes it difficult for investors to track amounts (Ikenberry & Vermaelen, 1996; Vermaelen, 1981). More importantly, reducing share repurchases is not associated with negative market reactions. Furthermore, prior research shows that for capital markets the economic consequences of adverse geopolitical events, particularly terrorist attacks, are temporary (Brounen & Derwall, 2010; Chesney et al., 2011; Goel et al., 2017). Therefore, share repurchase schemes are more appropriate for firms to implement in order to navigate geopolitical uncertainty than cash dividends. Based on the above arguments, we state the following competing hypotheses:

*H1a: Firms are likely to reduce share repurchases in response to higher geopolitical risk, whereas the effects of geopolitical risk on cash dividends are insignificant.*

*H1b: Firms are likely to increase share repurchases in response to higher geopolitical risk, whereas the effects of geopolitical risk on cash dividends are insignificant.*

### 3. Data and sample

#### 3.1. Sample selection

To construct our sample, we begin with all publicly listed US firms over the period between 1985 and 2019 in the Center for Research in Security Prices (CRSP)/Compustat Merged (CCM) database. The starting year of 1985 is chosen because the geopolitical risk (GPR) index recently developed by Caldara and Iacoviello (2022) starts in that year. The end year of 2019 is chosen as it allows a sufficient period of time for analysis that is not influenced by the COVID-19 pandemic and its aftermath. The data on stock returns are collected from the CRSP. Financial firms (SICs 6000–6999) and regulated utilities (SICs 4900–4999) are excluded from our sample. We also require our sample firms to have information available on repurchase transactions and financial data. Our final sample consists of 116,694 firm-year observations with 12,883 unique firms. The Appendix presents detailed definitions of the variables and the data sources for all key variables used in this paper. To mitigate the potential influence of extreme values, all the continuous variables are winsorized at the 1st and 99th percentiles of their distributions.

#### 3.2. Measuring geopolitical risk

Our proxy for geopolitical risk is the GPR index developed by Caldara and Iacoviello (2022) and made available on their website.<sup>5</sup> They define geopolitical risk as “the threat, realization, and escalation of adverse events associated with wars, terrorism, and any tensions among states and political actors that affect the peaceful course of international relations” (Caldara & Iacoviello, 2022, p. 1197). The GPR index is constructed by counting the frequency of articles mentioning adverse geopolitical events and related risks for each month. These articles are retrieved from the electronic archives of 10 newspapers through automated text searches.<sup>6</sup> The search in the automated text-search algorithm is organized in eight categories: C1 (War Threats), C2 (Peace Threats), C3 (Military Buildups), C4 (Nuclear Threats), C5 (Terror Threats), C6 (Beginning of War), C7 (Escalation of War), and C8 (Terror Acts). To address the concern that one-word searches would probably result in misclassifications and measurement errors, each category is covered by a search query composed of sets of two words, the joint presence of which is likely to imply adverse geopolitical events. The first set contains topic words (e.g., “war”, “military”, or “nuclear”). The second set includes “threat” words (e.g., “threat”, “warn”, or “danger”) for categories C1 to C5 and “act” words for C6 to C8 (e.g., “attack”, “kill”, or “bomb”).

The news-based index of geopolitical risks constructed by Caldara and Iacoviello (2022) provides the following advantages relative to the earlier literature. First, Caldara and Iacoviello (2022) show that the GPR index does not spike during recessions, financial crises and presidential elections, but is systematically correlated with adverse geopolitical events, such as wars and terrorist acts. This can help to separate the

<sup>5</sup> Economic Policy Uncertainty: <https://www.matteoiacoviello.com/gpr.htm>

<sup>6</sup> To capture occurrences with a broad scope and impact, Caldara and Iacoviello (2022) chose six newspapers from the United States (*The Chicago Tribune*, *The Los Angeles Times*, *The New York Times*, *USA Today*, *The Wall Street Journal*, and *The Washington Post*), three newspapers from the United Kingdom (*The Daily Telegraph*, *The Financial Times*, and *The Guardian*), and one newspaper from Canada (*The Globe and Mail*).

effects of geopolitical risk on corporate payout policy from other forms of uncertainty. Second, adverse geopolitical events always take place sporadically, which makes it difficult to investigate the dynamic effects of geopolitical uncertainty on corporate payout policy. The GPR index is available from 1985 and exhibits a sufficient variation over time that could help to examine whether, and to what extent, firms alter their payout decisions to distribute cash flow in response to fluctuations in GPR in a dynamic setting.

In this paper, we construct a GPR index (*Geopolitical Risk*) for each year as the 12-month average of the monthly GPR index provided by Caldara and Iacoviello (2022) calculated at the end of each year. Consistent with Hao et al. (2020), we use the natural logarithm of the annual GPR index in our regressions to normalize the distribution of the GPR index. Further, we follow Caldara and Iacoviello (2022) and Hao et al. (2020) and construct two subindexes. First, the *Geopolitical Threats (GPT)* index contains words belonging to categories C1 to C5 above that capture the risks/threats of adverse geopolitical events. Second, the *Geopolitical Acts (GPA)* index includes words belonging to categories C6 to C8 that include the act/realization of adverse geopolitical events only.

### 3.3. Measuring corporate payout policy

Consistent with Bliss et al. (2015), Dang et al. (2021), Fenn and Liang

(2001), and Grullon and Michaely (2002), we construct three measures as proxies for corporate payout policy. The total payout (*Total Payout*) is the sum of share repurchases (*Repurchase*) and cash dividends (*Cash Dividend*) divided by total assets. Share repurchase (*Repurchase*) is the difference between the purchase of common and preferred stock and the reduction in the preferred stock, all scaled by total assets. Cash dividend (*Cash Dividend*) is calculated as the common dividends divided by total assets.

For a robustness check, we follow previous literature (e.g., Chay & Suh, 2009; Dang et al., 2021; Leary & Michaely, 2011) and use five alternative measures of share repurchase (*Repurchase*) that are based on different scaling variables – market capitalization (*Repurchase over Market Cap*), book value of equity (*Repurchase over Book Equity*), sales (*Repurchase over Sales*), earnings (*Repurchase over Earnings*), and cash flow (*Repurchase over Cash Flow*) – instead of the total assets used in our baseline regressions. The Appendix provides definitions of these variables in greater detail.

### 3.4. Sample descriptive statistics

Panel A of Table 1 presents the summary statistics for the key variables used in this paper. *Geopolitical Risk* has a mean (standard deviation) of 4.564 (0.277). The mean values of *Geopolitical Threats (GPT)* and

**Table 1**  
Summary statistics.

Panel A: Summary statistics of key variables							
Variables	Obs.	Mean	Std. dev.	25th	Median	75th	
<b>Geopolitical risk variables</b>							
Geopolitical Risk	116,694	4.564	0.277	4.419	4.591	4.676	
Geopolitical Threats (GPT)	116,694	4.569	0.253	4.396	4.601	4.725	
Geopolitical Acts (GPA)	116,694	4.522	0.395	4.309	4.471	4.707	
<b>Payout variables</b>							
Repurchase	116,694	0.014	0.038	0.000	0.000	0.007	
Repurchase over Market Cap	116,689	0.012	0.034	0.000	0.000	0.008	
Repurchase over Book Equity	116,694	0.041	0.152	0.000	0.000	0.000	
Repurchase over Sales	116,331	0.016	0.048	0.000	0.000	0.008	
Repurchase over Earnings	77,492	0.329	0.834	0.000	0.000	0.289	
Repurchase over Cash Flow	116,694	0.093	0.217	0.000	0.000	0.051	
Total Payout	116,694	0.024	0.049	0.000	0.002	0.027	
Cash Dividend	116,694	0.009	0.020	0.000	0.000	0.011	
<b>Control variables</b>							
Firm Size	116,694	5.544	2.296	3.842	5.452	7.161	
Market to Book	116,694	2.715	4.338	1.050	1.822	3.231	
ROA	116,694	-0.036	0.243	-0.041	0.031	0.074	
Leverage	116,694	0.184	0.195	0.007	0.135	0.293	
Cash	116,694	0.168	0.197	0.027	0.089	0.238	
Sales Growth	116,694	0.139	0.455	-0.037	0.072	0.207	
Stock Return Vol	116,694	0.143	0.088	0.083	0.121	0.176	
Expected GDP Growth	116,694	0.027	0.006	0.023	0.027	0.030	
Consumer Confidence	116,694	4.481	0.126	4.416	4.520	4.552	
JLN EcoUncertainty	116,694	0.908	0.040	0.880	0.904	0.925	
<b>Panel B: Payout variables by industry</b>							
Industry	Obs.	Total Payout		Cash Dividend		Repurchase	
		Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Agriculture, Forestry, Fishing	509	0.027	0.053	0.016	0.028	0.008	0.029
Mining	8133	0.015	0.038	0.010	0.022	0.005	0.023
Construction	1829	0.011	0.030	0.003	0.008	0.008	0.027
Manufacturing	60,339	0.024	0.048	0.010	0.019	0.014	0.037
Transportation	8619	0.024	0.044	0.013	0.024	0.010	0.030
Wholesale Trade	5194	0.019	0.042	0.009	0.019	0.010	0.030
Retail Trade	9006	0.030	0.056	0.009	0.019	0.020	0.046
Services	23,065	0.026	0.056	0.007	0.020	0.017	0.044

This table presents the summary statistics for key variables used in this paper for the period 1985–2019. For each variable, we report the number of observations (Obs.), mean, standard deviation (Std. dev.), median, and 25th and 75th percentiles in Panel A. The summary statistics for key payout variables by industry are reported in Panel B. All continuous variables are winsorized at the 1st and 99th percentiles. See the Appendix for more detailed definitions of the variables.

Geopolitical Acts (GPA) are 4.569 and 4.522, respectively. These values are consistent with the findings in [Hao et al. \(2020\)](#). Further, the average total payout (*Total Payout*) for our sample firms is 2.4%. On average, a firm's annual share repurchases (*Repurchase*) yield 1.4%, whereas cash dividends (*Cash Dividend*) yield approximately 0.9%, which is comparable with that reported in [Fenn and Liang \(2001\)](#), [Grullon and Michaely \(2002\)](#), and [Ni et al. \(2020\)](#). Panel B shows the summary statistics for the payout variables by sectors. More than 70% of our sample is concentrated in the manufacturing and services sectors.

[Table 2](#) reports the correlation matrix of the main variables. The three measures of geopolitical risk, *Geopolitical Risk*, *Geopolitical Threats (GPT)*, and *Geopolitical Acts (GPA)*, are significantly and positively correlated with each other, as expected. *Total Payout* and *Repurchase* are consistently and negatively related to all the geopolitical risk measures. This supports our prediction that firms adopt a more conservative payout policy by reducing share repurchases in response to geopolitical shocks. However, there is no consistent correlation between *Cash Dividend* and geopolitical risk measures. In addition, the correlations among the independent/control variables are less than 0.4. Untabulated statistics show that the mean variance inflation factor (VIF) is 1.30, indicating that multicollinearity is not a major issue in our setting.

#### 4. Empirical design

To explore the impact of geopolitical risk on corporate payout policy, we employ the following ordinary least squares (OLS) model:

$$Payout_{i,t} = \alpha + \beta \times Geopolitical\ Risk_t + Controls_{i,t} + IndustryFE + \epsilon_{i,t} \quad (1)$$

where *i* refers to firm and *t* indexes year. *Payout* denotes three measures of payout policy: *Total Payout*, *Repurchase*, and *Cash Dividend*. The independent variable of interest is *Geopolitical Risk*, which is the natural logarithm of a 12-month average GPR index. *Controls* includes a vector

of firm-level control variables and a series of macro-level variables. First, following previous research (e.g., [Barth & Kasznik, 1999](#); [Dang et al., 2021](#); [Dittmar, 2000](#); [Grullon & Michaely, 2002](#); [Hoberg et al., 2014](#); [Ni et al., 2020](#)), the firm controls are *Firm Size*, *Market to Book*, return on assets (*ROA*), *Leverage*, *Cash*, *Sales Growth*, and *Stock Return Vol*. Second, consistent with the literature ([Attig, El Ghouli, Guedhami, & Zheng, 2021](#); [Duong, Nguyen, Nguyen, & Rhee, 2020](#)), the macro-level variables cover *Expected GDP Growth*, *Consumer Confidence*, and *JLN EcoUncertainty*. *Industry FE* captures the time-invariant differences across industries. We do not include the year fixed effect (*Year FE*) in our estimations due to *Geopolitical Risk* absorbing these effects; that is, all the sample firms are exposed to the same geopolitical risk at a given point in time. We further control for the time trend in our model to capture the patterns of firms' payout policy across time. The Appendix presents the definitions of the variables and data sources in greater detail. Note also that in order to increase the sample size, we follow [Dang et al. \(2021\)](#) and use the contemporaneous values of the controls in our regressions; our results, however, continue to hold when we use the lagged values of these variables.

We control for the impact of firm size (*Firm Size*), which refers to the natural logarithm of total assets, since more well-established firms tend to have fewer growth opportunities but more available resources, which is associated with a higher propensity to distribute wealth to shareholders through cash dividends and stock repurchases ([Bliss et al., 2015](#); [Fama & French, 2001](#)). [Lucas and McDonald \(1998\)](#) argue that firms that are undervalued by market participants are more likely to conduct stock buyback at a discounted price. However, overvalued firms prefer cash dividends to share repurchases, hence preventing the transfer of wealth to investors in open markets. Therefore, we control for the market-to-book ratio (*Market to Book*); that is, the market value of equity divided by the book value of equity.

Firms with greater profitability are better able to distribute wealth to shareholders. [Fama and French \(2001\)](#) find a positive relationship

**Table 2**  
Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Geopolitical Risk	1.00										
(2) Geopolitical Threats (GPT)	<b>0.87</b>	1.00									
(3) Geopolitical Acts (GPA)	<b>0.91</b>	<b>0.60</b>	1.00								
(4) Repurchase	-0.03	-0.04	-0.01	1.00							
(5) Repurchase over Market Cap	-0.04	-0.05	-0.02	<b>0.79</b>	1.00						
(6) Repurchase over Book Equity	-0.02	-0.03	-0.01	<b>0.45</b>	<b>0.34</b>	1.00					
(7) Repurchase over Sales	-0.02	-0.03	0.00	<b>0.84</b>	<b>0.70</b>	<b>0.38</b>	1.00				
(8) Repurchase over Earnings	-0.02	-0.03	0.00	<b>0.66</b>	<b>0.73</b>	<b>0.30</b>	<b>0.65</b>	1.00			
(9) Repurchase over Cash Flow	-0.02	-0.04	-0.01	<b>0.76</b>	<b>0.69</b>	<b>0.43</b>	<b>0.68</b>	<b>0.75</b>	1.00		
(10) Total Payout	-0.03	-0.03	-0.01	<b>0.86</b>	<b>0.65</b>	<b>0.39</b>	<b>0.71</b>	<b>0.53</b>	<b>0.63</b>	1.00	
(11) Cash Dividend	-0.01	0.01	-0.02	<b>0.14</b>	<b>0.06</b>	<b>0.06</b>	<b>0.10</b>	<b>0.00</b>	<b>0.07</b>	<b>0.59</b>	1.00
(12) Firm Size	-0.01	-0.04	<b>0.03</b>	<b>0.17</b>	<b>0.15</b>	<b>0.09</b>	<b>0.17</b>	<b>0.10</b>	<b>0.16</b>	<b>0.23</b>	<b>0.25</b>
(13) Market to Book	-0.02	-0.01	-0.02	<b>0.10</b>	-0.02	<b>0.03</b>	<b>0.08</b>	<b>0.04</b>	<b>0.06</b>	<b>0.12</b>	<b>0.09</b>
(14) ROA	-0.03	-0.01	-0.03	<b>0.17</b>	<b>0.12</b>	<b>0.09</b>	<b>0.11</b>	-0.05	<b>0.13</b>	<b>0.23</b>	<b>0.22</b>
(15) Leverage	-0.01	0.01	-0.03	-0.04	<b>0.02</b>	-0.09	-0.02	<b>0.02</b>	-0.04	-0.04	-0.01
(16) Cash	<b>0.03</b>	0.00	<b>0.05</b>	<b>0.06</b>	-0.01	<b>0.03</b>	<b>0.12</b>	<b>0.06</b>	<b>0.06</b>	<b>0.04</b>	-0.05
(17) Sales Growth	-0.05	-0.03	-0.05	-0.05	-0.07	-0.02	-0.04	-0.10	-0.05	-0.07	-0.07
(18) Stock Return Vol	<b>0.06</b>	0.01	<b>0.08</b>	-0.17	-0.15	-0.08	-0.14	-0.10	-0.14	-0.25	-0.29
(19) Expected GDP Growth	<b>0.17</b>	<b>0.05</b>	<b>0.24</b>	<b>0.03</b>	0.01	<b>0.02</b>	<b>0.03</b>	<b>0.01</b>	<b>0.03</b>	<b>0.02</b>	0.00
(20) Consumer Confidence	-0.20	-0.14	-0.21	-0.02	-0.02	-0.01	-0.02	-0.01	-0.01	-0.04	-0.05
(21) JLN EcoUncertainty	<b>0.12</b>	-0.03	<b>0.23</b>	<b>0.04</b>	<b>0.08</b>	<b>0.02</b>	<b>0.04</b>	<b>0.05</b>	<b>0.04</b>	<b>0.03</b>	0.00
(12) Firm Size	1.00										
(13) Market to Book	0.00	1.00									
(14) ROA	<b>0.35</b>	-0.03	1.00								
(15) Leverage	<b>0.27</b>	-0.07	0.00	1.00							
(16) Cash	-0.21	<b>0.15</b>	-0.21	-0.33	1.00						
(17) Sales Growth	-0.04	<b>0.11</b>	<b>0.04</b>	<b>0.01</b>	<b>0.07</b>	1.00					
(18) Stock Return Vol	-0.40	<b>0.03</b>	-0.35	-0.07	<b>0.19</b>	<b>0.07</b>	1.00				
(19) Expected GDP Growth	<b>0.04</b>	<b>0.02</b>	<b>0.03</b>	-0.02	<b>0.02</b>	<b>0.06</b>	-0.06	1.00			
(20) Consumer Confidence	-0.09	<b>0.04</b>	-0.02	<b>0.04</b>	-0.05	<b>0.06</b>	<b>0.03</b>	<b>0.24</b>	1.00		
(21) JLN EcoUncertainty	<b>0.03</b>	-0.05	-0.03	-0.01	<b>0.03</b>	-0.04	<b>0.03</b>	-0.17	-0.37	1.00	

This table presents correlation coefficients for the key variables used in this paper. Figures in bold indicate significance at least at the 1% level.

between firms' profitability and corporate payout. We use return on assets (ROA) as a proxy for firms' profitability. Furthermore, as internal financing is less costly than external financing for highly leveraged firms, firms with a higher leverage are likely to follow a more conservative payout policy by reducing both cash dividends and share repurchases in order to avoid experiencing financial distress or default (Chen & Wang, 2012; DeAngelo & DeAngelo, 1990; Maxwell & Stephens, 2003). We define the leverage ratio (*Leverage*) as long-term debt scaled by total assets.

Distributing free cash flow to shareholders through cash dividends and share repurchases has been known to be an effective tool for preventing managers from investing in value-decreasing projects (Jensen, 1986). Furthermore, Lee and Suh (2011) also find that firms with large cash reserves have greater incentives to utilize share repurchases as a more flexible means of distributing wealth to shareholders. Hence, we further control for cash holding, which is defined as the ratio of cash and cash equivalents to total assets. Life-cycle theory argues that firms that have higher growth potential are more likely to distribute less in the way of cash flow to shareholders than those with lower growth opportunities (DeAngelo, DeAngelo, & Stulz, 2006; Von Eije & Megginson, 2008). Sales growth (*Sales Growth*) is defined as the growth rate of total sales. Previous studies demonstrate that adoption of a conservative payout policy is an effective tool for diversifying cash flow risks (Bonaimé, Hankins, & Harford, 2014; Chay & Suh, 2009). We control the effects of stock return volatility (*Stock Return Vol*), measured as the standard deviation of monthly stock return.

We also follow previous studies in controlling for economic conditions, including *Expected GDP Growth*, *Consumer Confidence*, and *JLN EcoUncertainty* (Attig et al., 2021; Duong et al., 2020). In particular, *Expected GDP Growth* is defined as the average one year ahead GDP growth forecast. Expected GDP growth can provide corporate managers with information about future economic prospects, thereby affecting their payout decisions. Corporate managers are likely to distribute more cash flows to shareholders when there is higher expected GDP growth. Furthermore, *Consumer Confidence* is defined as the mean value of the monthly survey-based index of consumer confidence that is collected from surveys of consumers by the University of Michigan. Consumer confidence is also another indicator of whether the general public is confident about future economic conditions, which is related to corporate payout decisions. Finally, macroeconomic uncertainty can be another important determinant of corporate payout policy, since firms may have greater incentives to maintain payout flexibility. Therefore, we control for the effects of *JLN EcoUncertainty*, which is defined as the annual mean value of monthly common volatility in the unforecastable component in a system of 279 macroeconomic variables collected from Jurado, Ludvigson, and Ng (2015).

## 5. Empirical results

### 5.1. Baseline results

Table 3 shows the estimated results of Eq. (1). Column (1) explores the relationship between geopolitical risk and corporate total payout. The negative and significant coefficient on *Geopolitical Risk* suggests that geopolitical risk has a significant and negative association with total payout at the 1% level. In columns (2) and (3), we re-estimate our regressions for cash dividends and share repurchases, respectively. The empirical results document that geopolitical risk is significantly and negatively related to share repurchases at the 1% level. However, the effects of geopolitical risk on cash dividends are statistically insignificant. Specifically, taking an example from column (3), the estimated coefficient of *Geopolitical Risk* is  $-0.0040$ , implying that a one standard deviation increase in *Geopolitical Risk* decreases share repurchases by approximately 0.1108% ( $= -0.0040 \times 0.277$ ), which corresponds to a decrease of 7.9% relative to the sample mean (0.014). Collectively, the negative relationship between geopolitical risk and share repurchase is

**Table 3**

Baseline regression: geopolitical risk and corporate payout policy.

Dependent variables=	Total Payout	Cash Dividend	Repurchase
	(1)	(2)	(3)
Geopolitical Risk	-0.0043*** (0.0005)	0.0001 (0.0002)	-0.0040*** (0.0004)
Firm Size	0.0025*** (0.0002)	0.0011*** (0.0001)	0.0017*** (0.0001)
Market to Book	0.0013*** (0.0001)	0.0005*** (0.0000)	0.0008*** (0.0001)
ROA	0.0315*** (0.0013)	0.0093*** (0.0006)	0.0186*** (0.0008)
Leverage	-0.0117*** (0.0017)	-0.0071*** (0.0009)	-0.0060*** (0.0012)
Cash	0.0218*** (0.0018)	0.0033*** (0.0009)	0.0150*** (0.0013)
Sales Growth	-0.0076*** (0.0003)	-0.0026*** (0.0001)	-0.0044*** (0.0002)
Stock Return Vol	-0.0886*** (0.0025)	-0.0407*** (0.0014)	-0.0435*** (0.0016)
Expected GDP Growth	0.0922*** (0.0237)	-0.0628*** (0.0088)	0.1443*** (0.0195)
Consumer Confidence	0.0000 (0.0016)	-0.0047*** (0.0006)	0.0064*** (0.0013)
JLN EcoUncertainty	0.0471*** (0.0041)	-0.0065*** (0.0017)	0.0524*** (0.0033)
Time Trend	0.0003*** (0.0000)	-0.0000 (0.0000)	0.0003*** (0.0000)
Constant	-0.0170* (0.0099)	0.0383*** (0.0044)	-0.0638*** (0.0077)
Industry FE	YES	YES	YES
Observations	116,694	116,694	116,694
R-squared	0.1528	0.1638	0.1004

This table presents the results for the relationship between geopolitical risk and corporate payout policy based on Eq. (1). In column (1), the dependent variable is *Total Payout*, which is the sum of share repurchases (*Repurchase*) and cash dividends (*Cash Dividend*), all divided by total assets. In column (2), the dependent variable is *Cash Dividend*, measured as common dividends divided by total assets. In column (3), the dependent variable is *Repurchase*, which is the difference between the purchase of common and preferred stock and the reduction in the preferred stock, all divided by total assets. In all columns, the independent variable of interest is *Geopolitical Risk*, measured as the 12-month average of the monthly GPR index provided by Caldara and Iacoviello (2022). All continuous variables are winsorized at the 1st and 99th percentiles. See the Appendix for more detailed definitions of the variables. All columns control the industry fixed effects. Standard errors are clustered at the firm level and are reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

both statistically and economically significant.

With regard to the controls, these are generally in line with previous studies (e.g., Dang et al., 2021; Hoberg et al., 2014; Ni et al., 2020). More specifically, we find that *Firm Size* is positively and significantly correlated with corporate payouts, which supports the argument that larger firms tend to have fewer growth opportunities but more available resources, thereby distributing more wealth to shareholders to mitigate the agency cost of free cash flow (Bliss et al., 2015; Fama & French, 2001). We find that higher *Market to Book* is associated with higher cash dividends and share repurchase, which suggests that overvalued firms rely on corporate payouts to prevent the transfer of wealth to investors in the open market (Lucas & McDonald, 1998).

We also document that higher *ROA* is associated with higher cash dividends and share repurchases, which is consistent with the notion that more profitable firms are better able to pay out wealth to shareholders (Fama & French, 2001). Furthermore, a higher leverage ratio has a significant and negative effect on corporate payouts, which is in line with the arguments that more highly leveraged firms are likely to reduce both cash dividends and share repurchases in order to mitigate financial distress risk (Chen & Wang, 2012; DeAngelo & DeAngelo, 1990; Maxwell & Stephens, 2003). Our empirical results further provide support for the argument that firms with larger cash reserves are likely to pay out more free cash flow to shareholders and, therefore, constrain



managerial rent extraction (Jensen, 1986). We show that sales growth is significantly and negatively related to both cash dividends and share repurchases, which is consistent with the life-cycle theory that firms with greater growth opportunities have less free cash flow to be paid back to shareholders (DeAngelo et al., 2006; Von Eije & Megginson, 2008). Our empirical results show that the negative effect of stock return volatility on corporate payouts is significant at the 1% level, suggesting that firms are likely to reduce corporate payouts in order to diversify firm risk (Bonaime et al., 2014; Chay & Suh, 2009).

Finally, we find that firms significantly increase total payouts with expected GDP growth rises, which further supports the arguments that corporate managers pay out more wealth to shareholders when the expected economic conditions improve. In addition, our empirical results show that firms are likely to reduce cash dividends but increase share repurchases in response to greater economic uncertainty proxied by *JLN EcoUncertainty*. This is in line with the notion that reductions in cash dividends but increases in share repurchases can maintain payout flexibility and, therefore, help firms navigate economic uncertainty.

Collectively, our empirical findings show that the impact of geopolitical risk on corporate payout policy is driven by reductions in share repurchases. This is in line with our prediction that firms will adopt a more conservative payout policy by reducing share repurchases rather than cash dividends to navigate uncertainty induced by geopolitical shocks. In line with this, the following sections focus solely on the analysis of share repurchases.

## 5.2. Endogeneity test

### 5.2.1. Two-stage instrumental variables approach

Our baseline results from the OLS model in Eq. (1) may generate biased inferences due to the potential endogeneity concern induced by omitted variables. Specifically, unobservable or difficult-to-measure determinants of corporate payout policy could also be associated with our measures of geopolitical risk. To address this omitted variable bias, we first take a two-stage instrumental variables (IV) approach, as follows:

#### First stage:

$$Geopolitical Risk_{i,t} = \alpha + \beta \times Religious Tension Index_{i,t} + Controls_{i,t} + IndustryFE + \varepsilon_{i,t} \quad (2)$$

#### Second stage:

$$Repurchase_{i,t} = \alpha + \beta \times \widehat{Geopolitical Risk}_{i,t} + Controls_{i,t} + IndustryFE + \varepsilon_{i,t} \quad (3)$$

The IV approach requires an instrument in the first stage that is correlated with *Geopolitical Risk* but uncorrelated with corporate payout policy. Accordingly, in Eq. (2), the IV for *Geopolitical Risk* is the *Religious Tension Index* constructed by the ICRG. The religious tension score in the ICRG ratings ranges from 1 to 6: the higher the score, the less the religious conflict. To simplify the interpretation of our results, we follow the approach of Hao et al. (2020) and multiply the religious tension score by “-1”, using this transformed score in our estimations. The rationale behind the use of the *Religious Tension Index* as the instrument is that attempts by specific religious organizations to dominate a nation’s social, political, and governance processes are often deemed to be the root cause of religious tensions. In this regard, religious conflicts have emerged as one of the most significant geopolitical risk factors (Agnew, 2006). This suggests that the *Religious Tension Index* is likely to be positively relevant to geopolitical risk. Simultaneously, the *Religious Tension Index* has no plausible direct connection to corporate share repurchases, satisfying the exclusion condition of IVs.

Table 4 presents the estimated results from the two-stage IV approach. Panel A contains the firm-level control variables; Panel B includes a set of macro-level control variables. Columns (1) and (3) report the first-stage results; columns (2) and (4) show the results for the instrumented effects of *Geopolitical Risk* on share repurchases. As expected, we find that there is a positive and significant relationship between the *Religious Tension Index* and *Geopolitical Risk* at the 1% level in the first stage. Importantly, some relevant diagnostic tests regarding our use of the instrument show that it has strong theoretical validity, in addition to strong empirical validity. More specifically, the Cragg–Donald F-statistics for the weak identification test are 97,976.65 and 92,706.83 in Panel A and Panel B, respectively, both of which are comfortably higher than the Stock–Yogo nominal 10% critical value of 16.38. This allows us to reject the null of weak identification, implying that our instrument satisfies the relevance condition (Stock & Yogo, 2002). In the second stage, we find that the negative relationship between *Geopolitical Risk* and share *Repurchase* continues to hold at the 1% significance level. The magnitude of the coefficient on *Geopolitical Risk* is -0.0020 in column (4), which is comparable with that reported in column (3) in our baseline regression table (Table 3). Further, the Durbin–Wu–Hausman test statistics are consistently significant at the

**Table 4**  
Two-stage instrumental variables approach.

Dependent variables=	Panel A		Panel B	
	1st stage	2nd stage	1st stage	2nd stage
	Geopolitical Risk	Repurchase	Geopolitical Risk	Repurchase
	(1)	(2)	(3)	(4)
Religious Tension Index	0.4926*** (0.0014)		0.5019*** (0.0017)	
Geopolitical Risk		-0.0017*** (0.0006)		-0.0020*** (0.0006)
Firm Controls	YES	YES	YES	YES
Macro Controls	NO	NO	YES	YES
Time Trend	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Cragg–Donald Wald partial F-statistic		97,976.65		92,706.83
Stock–Yogo size of nominal 10% Wald		16.38		16.38
Durbin–Wu–Hausman test statistic		12.25***		21.68***
Observations		116,694		116,694

This table shows the results of the two-stage instrumental variables approach based on Eqs. (2) and (3). The variable being instrumented is *Geopolitical Risk*. The instrumental variable is the *Religious Tension Index* provided by the International Country Risk Guide (ICRG). Panel A contains the firm-level control variables, including *Firm Size*, *Market to Book*, *ROA*, *Leverage*, *Cash*, *Sales Growth*, and *Stock Return Vol*; Panel B includes a set of macro-level control variables, including *Expected GDP Growth*, *Consumer Confidence*, and *JLN EcoUncertainty*. All continuous variables are winsorized at the 1st and 99th percentiles. See the Appendix for more detailed definitions of the variables. All columns control the industry fixed effects. Standard errors are clustered at the firm level and are reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .



1% level, suggesting that our non-instrumented measures of geopolitical risk, *Geopolitical Risk*, are not sufficiently exogenous as to not require being instrumented when examining their impacts on share repurchase in our baseline regressions.

### 5.2.2. Firm fixed effect model

To capture observable and unobservable time-invariant firm-specific heterogeneities, we also adopt the firm fixed effect model, as below:

$$\text{Repurchase}_{i,t} = \alpha + \beta \times \text{Geopolitical Risk}_i + \text{Controls}_{i,t} + \text{FirmFE} + \varepsilon_{i,t} \quad (4)$$

Table 5 shows the empirical results. Column (1) contains the firm-level controls and column (2) controls for both the firm- and macro-level controls. In both columns, in addition to these control variables, we include a time trend variable and firm fixed effects. The negative and significant coefficients on *Geopolitical Risk* (at the 1% significance level) likewise support the above finding that geopolitical risk is negatively related to corporate share repurchase. Overall, the negative relationship between geopolitical risk and share repurchase is also statistically and economically significant in the firm fixed effect model.

## 5.3. Robustness checks

### 5.3.1. Alternative measures of share repurchase

To explore the robustness of our baseline results further, we follow [Chay and Suh \(2009\)](#), [Dang et al. \(2021\)](#), and [Leary and Michaely](#)

**Table 5**  
Firm fixed effect model.

Dependent variable = Repurchase	(1)	(2)
Geopolitical Risk	-0.0040*** (0.0004)	-0.0045*** (0.0004)
Firm Size	0.0011*** (0.0003)	0.0009*** (0.0003)
Market to Book	0.0003*** (0.0000)	0.0003*** (0.0000)
ROA	0.0134*** (0.0008)	0.0138*** (0.0008)
Leverage	-0.0008 (0.0013)	-0.0010 (0.0014)
Cash	0.0065*** (0.0015)	0.0062*** (0.0015)
Sales Growth	-0.0036*** (0.0002)	-0.0037*** (0.0002)
Stock Return Vol	-0.0354*** (0.0016)	-0.0353*** (0.0016)
Expected GDP Growth		0.1643*** (0.0199)
Consumer Confidence		0.0072*** (0.0014)
JLN EcoUncertainty		0.0498*** (0.0035)
Time Trend	0.0004*** (0.0000)	0.0004*** (0.0000)
Constant	0.0225*** (0.0024)	-0.0561*** (0.0082)
Firm FE	YES	YES
Observations	116,694	116,694
R-squared	0.0280	0.0316
Number of firms	12,883	12,883

This table reports the effect of geopolitical risk on share repurchase using the firm fixed effect model based on Eq. (4). The dependent variable is *Repurchase*, which is the difference between the purchase of common and preferred stock and the reduction in the preferred stock, all divided by total assets. The independent variable of interest is *Geopolitical Risk*, measured as the 12-month average of the monthly GPR index provided by [Caldara and Iacoviello \(2022\)](#). All columns control for firm fixed effects. Column (1) contains the firm-level control variables; column (2) contains a set of macro-level control variables. All continuous variables are winsorized at the 1st and 99th percentiles. See the Appendix for more detailed definitions of the variables. Standard errors are clustered at the firm level and are reported in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

(2011) and construct five alternative measures of share repurchase. These measures are the share repurchases, the difference between the purchase of common and preferred stock, and the reduction in the preferred stock, which are scaled by different variables: market capitalization (*Repurchase over Market Cap*), book value of equity (*Repurchase over Book Equity*), sales (*Repurchase over Sales*), earnings (*Repurchase over Earnings*), and cash flow (*Repurchase over Cash Flow*). Table 6 shows that the estimated coefficients on *Geopolitical Risk* across all columns are consistently negative at the 1% significance level, suggesting that our main results are robust to the five alternative measures referred to above.

### 5.3.2. Alternative measures of geopolitical risk

As a further robustness check, we use alternative measures of geopolitical risk and re-run our baseline regression. Table 7 presents the estimated results. Panel A reports results of the relationship between geopolitical risk and share repurchase by using two components of the GPR index. In column (1), the independent variable of interest is the *Geopolitical Threats (GPT)* index, which contains words belonging to categories C1 to C5 in the GPR index that capture the risks/threats of adverse geopolitical events. The independent variable of interest in column (2) is the *Geopolitical Acts (GPA)* index, which includes words belonging to categories C6 to C8 that include the act/realization of adverse geopolitical events only. The significant and negative coefficients of *Geopolitical Threats (GPT)* and *Geopolitical Acts (GPA)* likewise support a negative relationship between geopolitical risk and share repurchases.

Panel B tabulates the results of the relationship between geopolitical risk and share repurchase by using industry- and firm-level geopolitical risk. *GPR Industry Level* is a proxy for the industry-specific geopolitical risk index provided by [Caldara and Iacoviello \(2022\)](#). Following [Caldara and Iacoviello \(2022\)](#), *GPR Firm Level* is the firm-level geopolitical risk measure constructed by [Hassan, Hollander, Van Lent, and Tahoun \(2019\)](#). The estimated coefficients on *GPR Industry Level* and *GPR Firm Level* are significantly negative, suggesting that higher industry- and firm-level geopolitical risks are associated with a conservative payout policy of reducing share repurchases.

### 5.3.3. Subsamples

Table 8 shows the results of two robustness tests using subsamples. First, in order to enhance the transparency of issuer repurchases, the US Securities and Exchange Commission required disclosure of all issuer repurchases in 2003, including open market and private transactions.<sup>7</sup> After this, the repurchase-relevant information is disclosed in a more timely and accurate manner, the investor interest in that activity is growing, and the number of share repurchases is at a record high. Hence, the sample after 2003 is more representative. In Panel A of Table 8, we re-run our baseline regression using a subsample after 2003. Further, there are, on average, 9.06 (=116,694/12,883) yearly observations per firm in our baseline sample. Accordingly, we define “long-lasting” firms in our setting as firms that are listed for more than 10 years, and explore whether our baseline regression result holds for “long-lasting” firms in Panel B. The empirical results from these two tests show that our baseline findings continue to hold.<sup>8</sup>

## 5.4. Potential channel

Our empirical analysis has thus far suggested that geopolitical risk is negatively associated with share repurchase. It is of interest to conduct

<sup>7</sup> Please see *Purchases of Certain Equity Securities by the Issuer and Others*, Final Rule, Release No. 33-8335 US Securities and Exchange Commission: <http://www.sec.gov/rules/final/33-8335.htm>

<sup>8</sup> We acknowledge the contributions of two anonymous reviewers who suggested including these two robustness checks in our paper.

**Table 6**  
Alternative measures of repurchase.

Dependent variables=	Repurchase over Market Cap	Repurchase over Book Equity	Repurchase over Sales	Repurchase over Earnings	Repurchase over Cash Flow
	(1)	(2)	(3)	(4)	(5)
Geopolitical Risk	-0.0054*** (0.0004)	-0.0121*** (0.0017)	-0.0032*** (0.0005)	-0.0817*** (0.0117)	-0.0193*** (0.0024)
Firm Size	0.0013*** (0.0001)	0.0056*** (0.0005)	0.0028*** (0.0002)	0.0180*** (0.0025)	0.0107*** (0.0007)
Market to Book	-0.0001*** (0.0000)	0.0008*** (0.0001)	0.0006*** (0.0001)	0.0074*** (0.0014)	0.0023*** (0.0002)
ROA	0.0081*** (0.0005)	0.0314*** (0.0027)	0.0161*** (0.0011)	-1.0861*** (0.0867)	0.0706*** (0.0037)
Leverage	0.0012 (0.0009)	-0.0811*** (0.0033)	0.0002 (0.0015)	0.0922*** (0.0308)	-0.0411*** (0.0057)
Cash	0.0071*** (0.0008)	0.0065 (0.0040)	0.0343*** (0.0021)	0.4091*** (0.0345)	0.0746*** (0.0068)
Sales Growth	-0.0041*** (0.0002)	-0.0079*** (0.0008)	-0.0054*** (0.0004)	-0.1957*** (0.0102)	-0.0229*** (0.0014)
Stock Return Vol	-0.0362*** (0.0013)	-0.0737*** (0.0060)	-0.0486*** (0.0023)	-0.9968*** (0.0482)	-0.2151*** (0.0095)
Expected GDP Growth	0.0896*** (0.0180)	0.5061*** (0.0832)	0.1472*** (0.0252)	2.1225*** (0.5475)	0.8029*** (0.1153)
Consumer Confidence	0.0065*** (0.0011)	0.0106** (0.0052)	0.0093*** (0.0016)	0.2353*** (0.0321)	0.0469*** (0.0071)
JLN EcoUncertainty	0.0775*** (0.0032)	0.0942*** (0.0135)	0.0531*** (0.0042)	1.3251*** (0.0908)	0.2648*** (0.0188)
Time Trend	0.0001*** (0.0000)	0.0004*** (0.0001)	0.0003*** (0.0000)	0.0074*** (0.0005)	0.0017*** (0.0001)
Constant	-0.0741*** (0.0067)	-0.0776** (0.0314)	-0.0855*** (0.0102)	-1.8271*** (0.1975)	-0.3604*** (0.0443)
Industry FE	YES	YES	YES	YES	YES
Observations	116,689	116,694	116,331	77,492	116,694
R-squared	0.0600	0.0340	0.0931	0.0591	0.0801

This table shows the relationship between geopolitical risk and share repurchase using alternative measures of share repurchase based on Eq. (1). In columns (1)–(5), the dependent variables are share repurchases scaled by different variables: market capitalization (*Repurchase over Market Cap*), book value of equity (*Repurchase over Book Equity*), sales (*Repurchase over Sales*), earnings (*Repurchase over Earnings*), and cash flow (*Repurchase over Cash Flow*). In all columns, the independent variable of interest is *Geopolitical Risk*, measured as the 12-month average of the monthly GPR index provided by [Caldara and Iacoviello \(2022\)](#). All continuous variables are winsorized at the 1st and 99th percentiles. See the Appendix for more detailed definitions of the variables. All columns control the industry fixed effects. Standard errors are clustered at the firm level and are reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

further exploration of the potential channels through which geopolitical risk affects share repurchase. As discussed earlier, geopolitical shocks can, to a great extent, heighten cash flow uncertainty and exacerbate financial distress risks ([Bloom, 2009](#); [Brounen & Derwall, 2010](#); [Chesney et al., 2011](#); [Greenwald & Stiglitz, 1990](#)). To validate these potential mechanisms, this section examines whether, and to what extent, geopolitical risk affects firms' cash flow uncertainty and financial distress risk.

We first investigate the impact of geopolitical risk on the cash flow uncertainty that firms experience, by constructing three uncertainty measures: earnings volatility (*Earnings Vol*), cash flow volatility (*Cash Flow Vol*), and stock return volatility (*Stock Return Vol*). *Earnings Vol* is calculated using the standard deviation of quarterly operating income before depreciation divided by total assets. *Cash Flow Vol* is the standard deviation of quarterly cash flows. *Stock Return Vol* is the standard deviation of monthly stock returns. In addition, we explore how geopolitical risk affects firms' sales growth.<sup>9</sup> Panel A of [Table 9](#) presents the empirical results. The negative coefficient on *Geopolitical Risk* in column (1) implies that geopolitical risk significantly reduces firms' sales growth. The estimated coefficients of *Geopolitical Risk* show a positive relationship between geopolitical risk and the three measures of cash flow uncertainty at the 1% significance level in columns (2)–(4), which is consistent with our conjecture that firms face greater cash flow uncertainty as the level of geopolitical risk increases.

Further, we examine the relationship between geopolitical risk and firms' financial distress risk. The financial distress risk of a firm is

measured using [Altman's \(1968\)](#) Z-score (*Z Score*), [MacKie-Mason's, 1990](#) modified Z-score (*MZ Score*), and the expected default frequency (*EDF*) developed by [Bharath and Shumway \(2008\)](#). A lower *Z Score* or *MZ Score* implies that firms suffer from a higher risk of bankruptcy. Firms with a higher *EDF* value are more likely to default. Panel B of [Table 9](#) shows that the estimated coefficients of *Geopolitical Risk* are significant and negative (at the 1% significance level) in columns (1) and (2) and positive (1% significance level) in column (3). This is in line with our prediction that firms experience greater financial distress risk when geopolitical threats are higher.

Panels C and D display the path analyses of the links between share repurchases and geopolitical risks: a direct link and a link mediated by uncertainties and financial distress risks. We present the path coefficients ( $\beta$ ) of interest and the ratio of each path to the total effect of geopolitical risks on share repurchases (*percentage*). In Panel C, both the direct and indirect paths are negative and highly significant at the 1% level in columns (1) to (3). Taking an example from column (3), the direct path of geopolitical risks to share repurchases is 78.90% when controlling for stock return volatility. 21.10% of the total effect of geopolitical risks on share repurchases is attributed to the indirect path of stock return volatility. Further, the indirect path of financial distress risks in Panel D explains approximately 2% to 4% of the total effect of geopolitical risks on share repurchases. Taken together, our results indicate that the mediated links (via uncertainties and financial distress risks) between share repurchases and geopolitical risks are reliably non-zero, which supports our hypothesis.

### 5.5. Cross-sectional analysis

In this section, we explore whether the negative relationship

<sup>9</sup> We appreciate one anonymous reviewer's suggestion to try drivers linked to the real economy, such as sales volume/growth, in our channel section.

**Table 7**  
Alternative measures of geopolitical risk.

Dependent variable = Repurchase	(1)	(2)
<b>Panel A: Alternative measures</b>		
Geopolitical Threats (GPT)	-0.0043*** (0.0004)	
Geopolitical Acts (GPA)		-0.0022*** (0.0003)
Firm Controls	YES	YES
Macroeconomic Controls	YES	YES
Time Trend	YES	YES
Industry FE	YES	YES
Observations	116,694	116,694
R-squared	0.1004	0.1001

**Panel B: Industry- and firm-level geopolitical risk**

GPR Industry Level	-0.0005* (0.0003)	
GPR Firm Level		-0.0007* (0.0003)
Firm Controls	YES	YES
Macroeconomic Controls	YES	YES
Firm FE	YES	YES
Observations	114,251	39,156
R-squared	0.3392	0.4613

This table presents results for how geopolitical risk affects share repurchase when using alternative measures of geopolitical risk based on Eq. (1). Panel A alternatively uses two components of the GPR index. In column (1), the independent variable of interest is the *Geopolitical Threats (GPT)* index, which contains words belonging to categories C1 to C5 that capture the risks/threats of adverse geopolitical events. The independent variable of interest in column (2) is the *Geopolitical Acts (GPA)* index, which includes words belonging to categories C6 to C8 that include the act/realization of adverse geopolitical events only. Panel B presents results of the robustness checks using industry- and firm-level geopolitical risk. *GPR Industry Level* is the product of the industry exposure dummy times log changes in aggregate geopolitical risk provided by [Caldara and Iacoviello \(2022\)](#). Following [Caldara and Iacoviello \(2022\)](#), *GPR Firm Level* is the firm-level geopolitical risk measure constructed by [Hassan et al. \(2019\)](#). In all columns, the dependent variable is *Repurchase*, which is the difference between the purchase of common and preferred stock and the reduction in the preferred stock, all divided by total assets. All continuous variables are winsorized at the 1st and 99th percentiles. See the Appendix for more detailed definitions of the variables. Standard errors are clustered at the firm level and are reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

between geopolitical risk and share repurchase is heterogeneous across different cross-sectional variations in firm characteristics. Previous studies show that greater product market competition weakens individual firms' market power and pricing ability ([Datta, Iskandar-Datta, & Sharma, 2011](#); [Irvine & Pontiff, 2009](#)), thereby leading to higher cash flow uncertainty and greater default risk ([Chod & Lyandres, 2011](#); [Hoberg & Phillips, 2010](#)). Another strand of the literature suggests that firms are more likely to rely on internal financing and to adopt a more conservative financial policy when they experience a cash flow shortfall ([Chod & Lyandres, 2011](#); [Haushalter, Klasa, & Maxwell, 2007](#); [Xu, 2012](#)). In particular, share repurchase schemes have been shown to be an effective tool for preserving internal cash reserves, thereby maintaining financial flexibility ([Bonaimé et al., 2014](#); [Grullon & Michaely, 2002](#)).

We first investigate whether, and to what extent, the negative relationship between geopolitical risk and share repurchases is more pronounced for firms facing greater market competition. We use *HHI* to measure product market competition, calculated as the sum of the squared market shares derived from the total revenues of all listed firms in a two-digit SIC industry. A lower *HHI* value implies less market concentration and greater product market competition. Therefore, *Low HHI* is constructed as a proxy for firms facing greater market competition, which is a dummy variable that equals one if a firm's *HHI* is below

**Table 8**  
Subsamples.

Dependent variable=	Total Payout	Cash Dividend	Repurchase
	(1)	(2)	(3)
<b>Panel A: After the disclosure requirements for share repurchases by the US SEC (year &gt; 2003)</b>			
Geopolitical Risk	-0.0203*** (0.0030)	-0.0016 (0.0010)	-0.0155*** (0.0023)
Firm Controls	YES	YES	YES
Macroeconomic Controls	YES	YES	YES
Time Trend	YES	YES	YES
Industry FE	YES	YES	YES
Observations	47,071	47,071	47,071
R-squared	0.1798	0.1497	0.1366

**Panel B: "Long-lasting" firms**

Geopolitical Risk	-0.0048*** (0.0006)	0.0001 (0.0002)	-0.0045*** (0.0005)
Firm Controls	YES	YES	YES
Macroeconomic Controls	YES	YES	YES
Time Trend	YES	YES	YES
Industry FE	YES	YES	YES
Observations	84,341	84,341	84,341
R-squared	0.1790	0.1814	0.1180

This table presents robustness checks of our baseline regression results using subsamples. Panel A focuses on the subsample during 2003–2019, because the US Securities and Exchange Commission (SEC) addressed disclosure requirements for share repurchases in 2003 to enhance the transparency of issuer repurchases. Panel B includes "long-lasting" firms only: firms that are listed for more than 10 years. There are 9.06 yearly observations per firm (116,694/12,883) in our sample. Hence, we define a firm as "long-lasting" if it is listed for more than 10 years. All continuous variables are winsorized at the 1st and 99th percentiles. See the Appendix for more detailed definitions of the variables. Standard errors are clustered at the firm level and are reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

the sample median in year  $t-1$ , and zero otherwise. The results are presented in Panel A of [Table 10](#). The independent variable of interest, *Geopolitical Risk* × *Low HHI*, is statistically significant and negative. This suggests that the negative influence of geopolitical risk on share repurchases is stronger for firms facing a higher level of product market competition.

We next examine whether, and to what extent, the negative impact of geopolitical risk on share repurchases is stronger for firms with a higher default risk. We construct a dummy variable, *High EDF*, that equals one if a firm's expected default frequency is above the sample median in year  $t-1$ , and zero otherwise. The independent variable of interest is the interaction between *Geopolitical Risk* and *High EDF*. Panel B of [Table 10](#) shows the estimation results. We find that the coefficient on the interaction term, *Geopolitical Risk* × *High EDF*, is negative and significant. This supports our prediction that geopolitical risk has a stronger negative effect on share repurchases when firms are close to default.

## 6. Discussion and conclusion

In this study, we examined the effects of geopolitical risk on corporate payout policy. Specifically, we investigated whether firms adopt a more conservative payout policy in order to navigate uncertainty induced by geopolitical shocks. We also investigate whether, and to what extent, geopolitical risk alters firms' decisions with regard to choosing between cash dividends and share repurchases when paying out cash flow to shareholders. We adopted a range of analyses to investigate, directly and indirectly, the economic mechanisms through which geopolitical risk affects corporate payout choice.

We find that firms with greater exposure to geopolitical risk are more likely to adopt a conservative payout policy and that this effect is driven by reductions in share repurchases rather than cash dividends. We

**Table 9**  
Channel tests.

<b>Panel A: Uncertainties</b>								
Dependent variables=	Sales Growth		Earnings Vol		Cash Flow Vol		Stock Return Vol	
	(1)		(2)		(3)		(4)	
Geopolitical Risk	-0.0841***		0.0062***		0.0048***		0.0212***	
	(0.0052)		(0.0010)		(0.0012)		(0.0010)	
Firm Controls	YES		YES		YES		YES	
Macroeconomic Controls	YES		YES		YES		YES	
Time Trend	YES		YES		YES		YES	
Industry FE	YES		YES		YES		YES	
Observations	116,694		116,694		111,941		116,694	
R-squared	0.0440		0.3356		0.3115		0.2428	
<b>Panel B: Financial default risk</b>								
Dependent variables=	Z Score		MZ Score		EDF			
	(1)		(2)		(3)			
Geopolitical Risk	-0.2918***		-0.0814***		0.1015***			
	(0.0564)		(0.0237)		(0.0052)			
Firm Controls	YES		YES		YES			
Macroeconomic Controls	YES		YES		YES			
Time Trend	YES		YES		YES			
Industry FE	YES		YES		YES			
Observations	105,987		112,460		116,694			
R-squared	0.3814		0.6466		0.1048			
<b>Panel C: Path analysis (Uncertainties)</b>								
	(1)		(2)		(3)			
	Earnings Vol		Cash Flow Vol		Stock Return Vol			
	Coefficient	Z-stat	Coefficient	Z-stat	Coefficient	Z-stat		
<i>Direct Path</i>								
p(Geopolitical Risk, Repurchase)	-0.005	-11.274	-0.004	-10.372	-0.004	-8.964		
percentage	99.40%		99.30%		78.90%			
<i>Indirect Path</i>								
p(Geopolitical Risk, Uncertainties) = a	0.006163	7.419	0.004826	4.985	0.021192	24.897		
p(Uncertainties, Repurchase) = b	-0.004502	-3.188	-0.005866	-4.677	-0.045355	-33.062		
Total indirect path (=a × b)	-0.000028	-2.929	-0.000028	-3.411	-0.000961	-19.889		
percentage	0.60%		0.70%		21.10%			
Firm Controls	YES		YES		YES			
Macroeconomic Controls	YES		YES		YES			
Time Trend	YES		YES		YES			
Industry FE	YES		YES		YES			
Observations	116,694		111,941		116,694			
<b>Panel D: Path analysis (Financial distress risk)</b>								
	(1)		(2)		(3)			
	Z Score		MZ Score		EDF			
	Coefficient	Z-stat	Coefficient	Z-stat	Coefficient	Z-stat		
<i>Direct Path</i>								
p(Geopolitical Risk, Repurchase)	-0.004	-10.545	-0.005	-11.286	-0.004	-10.859		
percentage	98.00%		98.30%		95.80%			
<i>Indirect Path</i>								
p(Geopolitical Risk, Financial distress risk) = a	-0.291847	-5.646	-0.081376	-3.727	0.101509	19.307		
p(Financial distress risk, Repurchase) = b	0.000302	12.157	0.000966	17.214	-0.001864	-8.356		
Total indirect path (=a × b)	-0.000088	-5.120	-0.000079	-3.643	-0.000189	-7.669		
percentage	2.00%		1.70%		4.20%			
Firm Controls	YES		YES		YES			
Macroeconomic Controls	YES		YES		YES			
Time Trend	YES		YES		YES			
Industry FE	YES		YES		YES			
Observations	105,987		112,460		116,694			

This table explores the potential channels through which geopolitical risk affects corporate share repurchase. Panel A examines whether, and to what extent, geopolitical risk affects firms' sales growth and uncertainty, such as earnings volatility (*Earnings Vol*), cash flow volatility (*Cash Flow Vol*), and stock return volatility (*Stock Return Vol*). *Earnings Vol* is measured as the standard deviation of quarterly operating income before depreciation divided by total assets. *Cash Flow Vol* is the standard deviation of quarterly cash flows. *Stock Return Vol* is the standard deviation of monthly stock returns. Panel B shows the relationship between geopolitical risk and firms' default risk, measured using Altman's (1968) Z-score (*Z Score*), modified Altman's Z-score (*MZ Score*), and expected default frequency (*EDF*). Panels C and D



report the path analyses of the links between share repurchases and geopolitical risks: a direct link and a link mediated by uncertainties and financial distress risks, respectively. Specifically, we construct the structural equation models as: (1)  $Repurchase = \beta_0 + \beta_1 \times Geopolitical\ Risk + \beta_2 \times Uncertainties\ (or\ Financial\ default\ risk) + Controls + IndustryFE + \epsilon$ ; (2)  $Uncertainties\ (or\ Financial\ default\ risk) = \alpha_0 + \alpha_1 \times Geopolitical\ Risk + Controls + IndustryFE + \epsilon$ . Uncertainties are measured by *Earnings Vol*, *Cash Flow Vol*, and *Stock Return Vol*. We use three proxies for financial default risk: *Z Score*, *MZ Score*, and *EDF*.  $\beta_1$  indicates the direct impact and  $\alpha_1 \times \beta_2$  implies the indirect path. We present the path coefficients ( $p$ ) of interest and the ratio of each path to the total effect of geopolitical risks on share repurchases (*percentage*). All columns control firm- and macro-level control variables, in addition to a time trend variable and industry fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. See the Appendix for more detailed definitions of the variables. Standard errors are clustered at the firm level and are reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 10**  
Cross-sectional analysis.

Dependent variable = Repurchase		
	Panel A	Panel B
	Product market competition (HHI)	Expected default frequency (EDF)
	(1)	(2)
Geopolitical Risk	-0.0033*** (0.0005)	-0.0021* (0.0011)
Low_HHI	0.0143*** (0.0051)	
Geopolitical Risk×Low_HHI	-0.0030*** (0.0011)	
High_EDF		0.0103** (0.0052)
Geopolitical Risk×High_EDF		-0.0022* (0.0011)
Firm Controls	YES	YES
Macroeconomic Controls	YES	YES
Time Trend	YES	YES
Industry FE	YES	YES
Observations	116,031	116,031
R-squared	0.1008	0.1008

This table shows the cross-sectional differences in the effect of geopolitical risk on share repurchases. Panel A examines whether the negative relationship between geopolitical risk and share repurchase is more pronounced for firms with greater market competition. The independent variable of interest is *Geopolitical Risk×Low\_HHI*. *HHI* is calculated as the sum of the squared market shares derived from the total revenues of all listed firms in a two-digit SIC industry. *Low\_HHI* is a dummy variable that equals one if a firm's *HHI* is below the sample median in year  $t-1$ , and zero otherwise. Panel B investigates whether the negative impact of geopolitical risk on share repurchase is stronger for firms with greater default risk. The independent variable of interest is *Geopolitical Risk×High\_EDF*. *EDF* is the expected default frequency developed by [Bharath and Shumway \(2008\)](#). *High EDF* is a dummy variable that equals one if a firm's *EDF* is above the sample median in year  $t-1$ , and zero otherwise. All columns control for firm- and macro-level control variables, in addition to a time trend variable and industry fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. See the Appendix for more detailed definitions of the variables. Standard errors are clustered at the firm level and are reported in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

further demonstrate that higher geopolitical risk is associated with

**Appendix. Descriptions of the variables**

Variables	Description	Source
<b>Independent Variables</b>		
Geopolitical Risk	Natural logarithm of the GPR index. The GPR index for each year is a 12-month average of the geopolitical risk (GPR) calculated at the end of each fiscal year.	<a href="#">Caldara and Iacoviello (2022)</a> <a href="https://www.policyuncertainty.com/gpr.html">https://www.policyuncertainty.com/gpr.html</a>
Geopolitical Threats (GPT)	Natural logarithm of the GPT index. The GPT index for each year is a 12-month average of the geopolitical threats (GPT) calculated at the end of each fiscal year. GPT includes threat-related adverse geopolitical events only.	<a href="#">Caldara and Iacoviello (2022)</a> <a href="https://www.policyuncertainty.com/gpr.html">https://www.policyuncertainty.com/gpr.html</a>
Geopolitical Acts (GPA)		<a href="#">Caldara and Iacoviello (2022)</a> <a href="https://www.policyuncertainty.com/gpr.html">https://www.policyuncertainty.com/gpr.html</a>

(continued on next page)

greater cash flow uncertainty and a higher threat of financial distress, providing rich insights into the potential channels through which geopolitical risk alters corporate payout decisions. Both of these effects are statistically and economically significant. Our cross-sectional analysis shows that the effects of geopolitical risk on share repurchases are more pronounced for firms with higher product market competition and those that suffer from a greater threat of financial distress. Our findings are robust to alternative measures of geopolitical risk and share repurchase, address endogeneity concerns induced by omitted variables, utilize a relevant and plausibly exogenous instrumental variable, and control for time-invariant unobservable heterogeneity across firms in a firm fixed effect model.

Collectively, our findings provide novel evidence to suggest that firms prefer reductions in share repurchases to reducing cash dividends in response to geopolitical shocks, which further emphasizes that share repurchases are deemed to be more flexible and effective in mitigating cash flow uncertainty induced by geopolitical uncertainty. Our study contributes to a growing body of literature on the economic consequences of geopolitical risk for corporate decision making by showing that geopolitical risk is an important but overlooked factor in shaping corporate financing decisions. We also complement previous studies concerning payout choice by showing that firms are reluctant to cut cash dividends in response to external geopolitical shocks and are more likely to rely on share repurchase schemes.

**Declaration of Competing Interest**

None.

**Data availability**

Data will be made available on request.

(continued)

Variables	Description	Source
	Natural logarithm of the GPA index. The GPA index for each year is a 12-month average of the geopolitical acts (GPA) calculated at the end of each fiscal year. GPA includes act-related adverse geopolitical events only.	
GPR Industry Level	The product of the industry exposure dummy times log changes in aggregate geopolitical risk.	Caldara and Iacoviello (2022) <a href="https://www.policyuncertainty.com/gpr.html">https://www.policyuncertainty.com/gpr.html</a>
GPR Firm Level	The firm-level geopolitical risk measure constructed by Hassan et al. (2019).	Caldara and Iacoviello (2022) <a href="https://www.policyuncertainty.com/gpr.html">https://www.policyuncertainty.com/gpr.html</a>
Religious Tension Index	The ICRG religious tension score multiplied by -1.	International Country Risk Guide (ICRG)
<b>Dependent Variables</b>		
Repurchase	The difference between the purchase of common and preferred stock ( <i>PRSTKC</i> ) and the reduction in the preferred stock ( <i>PSTKRV</i> ), all divided by the book value of total assets ( <i>AT</i> ).	Compustat
Repurchase over Market Cap	The difference between the purchase of common and preferred stock ( <i>PRSTKC</i> ) and the reduction in the preferred stock ( <i>PSTKRV</i> ), all divided by the market capitalization ( $PRCC \times CSHO$ ).	Compustat
Repurchase over Book Equity	The difference between the purchase of common and preferred stock ( <i>PRSTKC</i> ) and the reduction in the preferred stock ( <i>PSTKRV</i> ), all divided by the book value of equity. The book value of equity is stockholders' equity ( <i>SEQ</i> ) or book common equity ( <i>CEQ</i> ) plus book preferred stock ( <i>PSTK</i> ) or book total assets ( <i>AT</i> ) minus book total liabilities ( <i>LT</i> ), minus preferred stock (defined below), plus deferred taxes and investment tax credit ( <i>TXDITC</i> ), if available, minus the post-retirement benefit asset ( <i>PRBA</i> ), if available. Preferred stock is the liquidating value of preferred stock ( <i>PSTKL</i> ) or the redemption value of preferred stock ( <i>PSTKRV</i> ) or the par value of preferred stock ( <i>PSTK</i> ). If items <i>PSTKL</i> , <i>PSTKRV</i> , and <i>PSTV</i> are not available, preferred stock is set to zero.	Compustat
Repurchase over Sales	The difference between the purchase of common and preferred stock ( <i>PRSTKC</i> ) and the reduction in the preferred stock ( <i>PSTKRV</i> ), all divided by sales ( <i>SALE</i> ).	Compustat
Repurchase over Earnings	The difference between the purchase of common and preferred stock ( <i>PRSTKC</i> ) and the reduction in the preferred stock ( <i>PSTKRV</i> ), all divided by earnings ( <i>IB</i> ).	Compustat
Repurchase over Cash Flow	The difference between the purchase of common and preferred stock ( <i>PRSTKC</i> ) and the reduction in the preferred stock ( <i>PSTKRV</i> ), all divided by cash flow. Cash flow is the operating income before depreciation ( <i>OIBDP</i> ).	Compustat
Total Payout	The sum of repurchases (difference between <i>PRSTKC</i> and the reduction in <i>PSTKRV</i> ) and cash dividends ( <i>DVC</i> ), all divided by the book value of total assets ( <i>AT</i> ).	Compustat
Cash Dividend	Common dividends ( <i>DVC</i> ) divided by the book value of total assets ( <i>AT</i> ).	Compustat
<b>Control Variables</b>		
Firm Size	Natural logarithm of the book value of total assets ( <i>AT</i> ).	Compustat
Market to Book	Market value of equity ( $PRCC_F \times CSHO$ ) divided by the book value of equity ( <i>CEQ</i> ).	Compustat
ROA	Return on assets ( $NI/AT$ ).	Compustat
Leverage	Long-term debt ( <i>DLTT</i> ) divided by total assets ( <i>AT</i> ).	Compustat
Cash	Cash and cash equivalents ( <i>CHE</i> ) divided by total assets ( <i>AT</i> ).	Compustat
Sales Growth	Growth rate of total sales ( <i>SALE</i> ) from year <i>t-1</i> to year <i>t</i> .	Compustat
Stock Return Vol	Standard deviation of monthly stock returns ( <i>RET</i> ) in year <i>t-1</i> .	CRSP
Expected GDP Growth	The average one-year-ahead GDP growth forecast.	Philadelphia Federal Reserve's Livingston survey <a href="https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/livings-ton-historical-data">https://www.philadelphiafed.org/surveys-and-data/real-time-data-research/livings-ton-historical-data</a>
Consumer Confidence	The average consumer confidence in a year, calculated as the monthly survey-based index of consumer confidence.	Surveys of consumers, University of Michigan <a href="https://data.sca.isr.umich.edu/data-archive/mine.php">https://data.sca.isr.umich.edu/data-archive/mine.php</a>
JLN EcoUncertainty	The average JLN uncertainty index in a year, which is constructed to gauge macroeconomic uncertainty. The monthly JLN is calculated as the common volatility in the unforecastable component in a system of 279 macroeconomic variables.	Jurado et al. (2015) <a href="https://www.sydneyludvigson.com/macro-and-financial-uncertainty-indexes">https://www.sydneyludvigson.com/macro-and-financial-uncertainty-indexes</a>
<b>Other Variables</b>		
Cash Flow Vol	Standard deviation of quarterly cash flows. Cash flow is calculated as the earnings ( <i>EBIT</i> ) minus interest ( <i>XINT</i> ), dividends ( <i>DVC</i> ), and taxes ( <i>TXT</i> ), all divided by total assets ( <i>AT</i> ).	Compustat
Earnings Vol	Standard deviation of quarterly operating income before depreciation ( <i>OIBDP</i> ) divided by total assets ( <i>AT</i> ).	Compustat
Z Score	Altman's (1968) $Z\text{ Score} = 1.2 \times WC/AT + 1.4 \times RE/AT + 3.3 \times EBIT/AT + 0.6 \times MV/LT + 0.999 \times SALES/AT$ , where <i>WC</i> proxies for working capital, <i>AT</i> proxies for total assets, <i>RE</i> is retained earnings, <i>EBIT</i> proxies for earnings before interest and taxes, <i>MV</i> proxies for market value of equity, <i>LT</i> proxies for total liabilities, and <i>SALES</i> proxies for turnover.	Compustat
MZ Score	Modified Altman's (1968) $Z\text{ Score}$ from MacKie-Mason (1990).	Compustat
EDF	The expected default frequency developed by Bharath and Shumway (2008).	Compustat
High EDF	High EDF is a dummy variable that equals one if a firm's EDF is above the sample median in year <i>t-1</i> , and zero otherwise.	Compustat
Low HHI	HHI is calculated as the sum of the squared market shares derived from total revenues of all listed firms in a two-digit SIC industry. Low HHI is a dummy variable that equals one if a firm's HHI is below the sample median in year <i>t-1</i> , and zero otherwise.	Compustat

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