Does Geopolitical Risk explain IPO first-day returns? *

Dimitrios Gounopoulos† Abhinav Goyal‡ Meziane Lasfer‡,[1]

Abstract

We find that geopolitical risk affects negatively, and significantly global IPO market, which, in turn, reduces substantially IPO underpricing. Our results are consistent with the sentiment hypothesis, but in contrast to the information asymmetries and investment bankers risk-taking hypotheses which would predict a higher underpricing. Our results hold for various measures of other IPO outcomes, several robustness checks, and after accounting for various controls. We report that various measures of firm's specific information asymmetry factors of the issuing firm, and the cross-country level regulatory reforms, and the strength of country-level external governance mechanisms mitigate this effect. Overall, our results highlight further the effect of investor sentiment, driven by macro-economic factors, in shaping IPO outcomes and underpricing.

Keywords: Geopolitical Risk; IPOs; First-Day Returns; Underwriter Reputation;

JEL classification: G10, G14, G39.

[1] Gounopoulos is from the School of Management, University of Bath, Bath BA2 7AY, UK. Email: dg652@bath.ac.uk. Goyal is from Birmingham Business School, University of Birmingham, Birmingham B15 2TY, UK. Email: abhinav.goyal@ucc.ie, Lasfer is from Bayes Business School, City, University of London, London EC2Y 8TZ, UK. Email: m.a.lasfer@city.ac.uk. We would like to thank conference participants at Hellenic Accounting and Finance Association for helpful comments and suggestions.

I. Introduction

During 2022, worldwide initial public offerings (IPOs) market fell to 1,333, a 45% decline and generated just $180 billion, a drop of 61% compared with the previous year, slightly less than in the US where the proceeds plummeted 94% and the number of IPOs sank 78% to just 90 (EY, 2022). Such falls can be related to geopolitical tensions, high inflation, stock market volatility and the most aggressive monetary policy tightening since the 1980s. These factors, in turn, affected investor sentiments, making them more risk averse, reducing their demands for IPOs, and favouring companies that can demonstrate resilient business models in profitability and cash flow. In this paper, we investigate whether considerations also affected the predominant and universal positive first day returns, commonly known as underpricing, generated by IPOs.

Previous studies advocated several reasons for the level of IPO underpricing[2]. Some suggest that the first day trading price is too high because of the excess demand from potential investors, reflecting market inefficiency due to behaviour biases such as speculation bubbles (Loughran and Ritter, 2002) and investors' over-optimism (Rajan and Servaes, 1997). Loughran and Ritter (2004) suggest that "changing issuer objective function" hypothesis, namely spinning and analyst lust, drives underpricing[3]. Bradley, Kim and Krigman (2015) relate underpricing to the agreement between underwriters and venture capitalists (VCs). The former benefits from underpricing vis-à-vis allocation strategies, but the underwriters allocate star financial analysts, who are a scarce resource, to their best clients, the top VCs, who bring them repeat business, to support the price in the post-IPO period. This strategy results in more underpriced VC-backed IPOs at the IPO date, but their stock prices will rise to the lockup expiry date,

[2] See Ritter and Welsh (2002) and Lowry, Michaely and Volkova (2017) for extensive reviews.

[3] Spinning refers to the practice of allocating intentionally underpriced IPO shares as a payoff to corporate clients, while analyst lust refers to the desire of issuer firms to receive favorable analyst coverage. Liu and Ritter (2010) find that "spun" IPOs had first day returns of 23%, greater than similar IPOs, and companies that were offered IPOs switched underwriters only 6% of the time, compared to 31% for companies that were not offered IPOs.

allowing VCs to gain from information momentum and to cash-out at higher prices at lockup expiration. Aggarwal, Purnanandam, and Wu (2005) relate IPO underpricing to tie-in agreement, referred to as 'laddering', which occurs when purchasers agree to buy additional shares of an issue in the aftermarket in exchange for access to the IPO. Such IPOs are likely to be significantly more underpriced than those without tie-in agreements. Others relate the underpricing to a deliberate low offer price to, for example, signal IPO's quality and to compensate investors for their insufficient information about the IPO (Rock, 1986; Benveniste and Spindt, 1989; Chowdry and Nanda, 1996; Brau and Fawcett, 2006).

However, the previous literature finds it difficult to test former explanations empirically, leaving the information asymmetry/signalling hypothesis to remain the dominant determinant of underpricing, but it fails to explain IPOs' first day returns during the internet bubble. The purpose of this paper is to fill in this gap in the literature by using the geopolitical risk to proxy for the investor sentiment. In contrast to the information asymmetries and risk for investment bankers' hypotheses, which would predict a higher underpricing to compensate investors for the IPO's business and financial risks, we expect geopolitical risk and macroeconomic landscape to reflect investors' sentiments, but their impact may lead to either higher or lower underpricing. On the one hand, geopolitical risks exacerbated by wars, high energy and commodity prices, alongside inflationary pressures and associated interest rates rises, and supply chain complexities, will ultimately create uncertainty for the future cash flows of businesses looking to float and, consequently, will result in higher underpricing to compensate investors for their risk, in line with signalling expectations. In this case, we expect a positive relationship between underpricing and geopolitical risk, implying that investors are too optimistic and will lower their demand for IPO, and ask for a higher compensation for their risk taking in the form of high underpricing.

On the other hand, these uncertain geopolitical pressures are also expected to lead to a weaker IPO market, but a lower underpricing because of a better assessment of IPO valuations. These arguments

are based on Khanna, Noe, and Sonti (2008) who suggest that in hot markets, increased information acquisition costs for sophisticated investors reduces IPO screening, as underwriters may not have sufficient specialized labour in screening IPOs during hot market, thus encouraging unqualified firms to enter the IPO market. In their model when underwriters become overextended, because of a growing pipeline, their ability to effectively screen and market deteriorates, leading to a higher first day returns for IPOs managed by these underwriters. In contrast, during cold IPO markets, Yung, Çolak, and Wang (2008) conclude that firm quality is greater, and underwriters will not have greater market power as companies are not all competing for coverage from the highest profile analysts, contributing toward a positive relation between underpricing and the number of companies going public (Liu and Ritter, 2011; Boeh and Dunbar, 2014). These considerations suggest that geopolitical risk will negatively affect the IPO market, and, consequently, lead to lower IPO underpricing.

We use a sample of 23,630 IPOs across 35 countries from 1990 to 2020 to test our hypotheses. We find that geopolitical risk affects negatively, and significantly global IPO market, as measured by the total number of IPOs each year in the country of issuance (volume of IPOs), and the total number of IPOs in the issue year divided by the number of listed firms for the country of listing (IPO activity), and the level of underpricing. Our results are consistent with the sentiment hypothesis, but contrary to the information asymmetries and investment bankers' risk hypotheses that predict higher underpricing during geopolitical risk periods.

However, we show that the relationship between underpricing and the geopolitical risk is more complex. We find that the geopolitical risk negatively affects the IPO volume, which, in turn, is negatively related to underpricing, in line with Khanna et al (2008) predictions. We use a 2-stage least quare method to account for this effect. We first regress IPO market, defined as IPO activity and IPO volume in each country on geopolitical risk and a set of control variables. We then use the fitted IPO

activity and fitted volume of IPOs as explanatory variables in our underpricing regression. We find both these coefficients to be positive and significant, suggesting that an increase in the geopolitical risk depresses the IPO market, resulting in significantly lower IPO underpricing. Overall, our results support the implications of the theoretical model of Khanna, et al. (2008) who show that a decrease in the number of IPOs, which, in our case is due to a lower geopolitical risk, results in a drop in demand for specialized labour, which is in fixed supply, to screen them, with subsequent increase in screening, thus, encouraging good quality firms to enter the IPO market, and leading to lower underpricing. They posit that, in hot IPO market, a less positive role for underwriters in IPO pricing, as when underwriters become overextended (because of a growing pipeline), their ability to effectively screen and market the IPO deteriorates, leading to an increase in the first day returns for IPOs managed by these underwriters. In contrast, the consequences of the rapid shifting in the geopolitical landscape and its subsequent creation of multi-dimensional challenges for global organisations, results in a significant decline in IPO activity, better screening of IPO firms, and lower underpricing. In a complex and often volatile environment, business strategy and operational efficiency require constant evaluation, and our results indicate that such shifts occur at the business organisations' level, but also for underwriters.

We subject our results to a battery of robustness checks. We show that our results hold when we define IPO underpricing using one-week after listing and when we adjust the first day return by the listing-day market return. We also find same results when we use global geopolitical risk, threats of geopolitical risk from geopolitical threats index, or realization of geopolitical risk from geopolitical acts index as proxy variables for geopolitical risk. Our results also do not depend on some econometric specification, such as clustering the standard errors at country-year level, or excluding the US, a country with maximum volume of IPOs and highest average GPR, and countries with maximum volume of IPOs, namely US, China, Japan, HK, and India. Moreover, our results hold across various time periods, IPO

sectors and countries of origin, except that the impact of geopolitical risk is subdued in 2006 to 2010 sub-periods, for IPOs in telecommunication and utilities sectors, and listings in Germany, Italy, Mexico, and Sweden.

Although we control for major factors that are likely to affect underpricing and IPO market, we consider that our results may suffer for omitting variable bias. We mitigate this potential effect by using instrumental variable estimation method. We use country specific index for the level of religious tension on a scale of 0 to 1, with higher score indicating lower level of religious tension, and we multiply this score by -1 to align its interpretation with geopolitical index. We find that our results hold.

We then document some factors that mitigate this impact, including firm specific factors such as the third-party certification, and the information asymmetry of the issuing firm, and macro-economic factors including the cross-country regulatory reforms, and the strength of country-level external governance mechanisms. We find that the interaction variable between geopolitical risk and underwriter reputation, number of underwriters or big four auditing firms mitigate the effective of geopolitical risk on the level of underpricing, which remains strongly negative in all our specifications. We find similar effects when we interact geopolitical risk with other variables that proxy for firm specific information asymmetry effects, including firm size, IPO age, carve out, diversification, and use of proceeds. We also find similar results when we test for the moderating effect of the strength of country-level external governance mechanisms, including the potential effects of regulatory reforms introduced at country-level using boardroom reforms, IFRS adoption, and leniency legislation, and external governance and level of institutional quality at country-level, as measured by shareholder rights, accounting conservatism, democracy index, institutional quality, and press freedom. We conclude that macro-economic factors drive investor sentiment, explain the observed current dearth in IPO activity, and shape IPO outcomes and underpricing levels.

We contribute in various ways to the previous literature. Unlike most previous evidence, we provide additional evidence on the impact of macro-economic factors on the IPO market and underpricing using a large cross-country IPO data. We find that the geopolitical risk, with its impact on investor sentiment, affects differently underpricing than IPO firms' and/or underwriters' idiosyncratic risk, which increase the level of underpricing. We show that geopolitical risk reduces underpricing, through its negative impact on the IPO market. Overall, our results highlight further the effect of investor sentiment, driven by macro-economic factors, in shaping IPO outcomes and underpricing.

The rest of this paper is organized as follows. Section 2 describes the sample used in the empirical analysis and provides the analysis of the descriptive statistics. In Section 3 we present the empirical methods and the analysis of the impact of geographic location on IPO underpricing. Section 4 provides some further robustness checks. Section 5 concludes.

2. Sample and Variables

2.1 Sample

We obtain the data for this study from several sources. We utilise the geopolitical risk index developed by Caldara and Iacoviello (2022) as our measure for *Geopolitical risk.* Firm-level financial information and stock price data are obtained from Datastream and Worldscope. Data on country-level economic development and the quality of listing stock exchanges are obtained from the World Bank's World Development Indicators.

Caldara and Iacoviello (2022) construct *Geopolitical risk* by applying algorithm to count the number of the newspaper articles associated with wars, terrorism and nuclear conflicts that are exogenous shocks to the economy and have a significant impact on the international relationship. By capturing the number of the articles that contain keywords related with the geopolitical risks, they construct the

geopolitical risk index for the United States by calculating the percentage of the articles related with geopolitical risk over the total number of the articles among the eleven leading English newspapers in the U.S..[4] Next, Caldara and Iacoviello (2022) also construct country-specific geopolitical risk index for additional thirty-eight countries by employing the similar automated text-search results from the electronic archives of three U.S. newspapers.[5] For the non-U.S. countries, they count the share of newspaper articles that contain keywords related with the geopolitical risks along with the mention of the name of the country or of its major cities. To study the effect of *Geopolitical risk* on IPO outcomes, we match and use the value of the *Geopolitical risk* for the same country-month-year combination as the listing of the IPO firm.

We collect the IPO data from the SDC Platinum New Issue Database from 1990 through 2020. Following prior research (Boulton et al. 2010, 2017; Duong et al. 2021, 2022; Chen et al. 2020a), we exclude exchange-traded funds, American and Global depositary receipts, rights offerings, spin-off private placements, closed-end funds, real estate investment trusts, limited partnerships, and Special Purpose Acquisition Companies (SPACs). Next, we require IPO firms to at least have information in Datastream or Worldscope for the year of listing. Further, we limit our international IPO sample to thirty-nine countries for which the Geopolitical risk index data is available in Caldara and Iacoviello website (https://www.matteoiacoviello.com/gpr2019.htm). Finally, following Chen et al. (2020a), we drop the IPOs from four countries[6] with fewer than 10 IPOs during our sample period.[7] These steps result in a final sample of 23,630 IPOs listed in 35 countries over a thirty-one-year sample period.

[4] These include – Boston Globe, Chicago Tribune, Daily Telegraph, Financial Times, Globe and Mail, Guardian, Los Angeles Times, New York Times, Times, Wall Street Journal and Washington Post

[5] These include New York Times, Chicago Tribune, and Washington Post.

[6] We exclude the IPOs from Peru, Saudi Arabia, Ukraine, and Venezuela because of data unavailability.

[7] In line with Boulton et al. (2011), we do not impose a minimum offer price restriction. Applying a $1.00 minimum offer price (converting local currency to U.S. dollars based on the exchange rate as of the IPO date) filter would greatly reduce the number of IPOs in many emerging countries. Therefore, the main analysis presented here imposes no minimum offer price, but we do verify that our results are unaffected by the exclusion of IPOs with low offer prices.

2.2 Variables

Our dependent variable is the IPO first-day return (*IPO underpricing*). Following prior research (e.g., Ljungqvist 2007; Chen et al. 2020a, 2020b; Duong et al. 2021, 2022) we calculate *IPO underpricing* as the listing-day closing price of an IPO minus its offer price, scaled by the offer price. Following prior literature (e.g., Boulton et al. 2010; Chen et al. 2022), we winsorize the non-dummy variables at the top and bottom one percentiles to mitigate the potential impact of outliers. Our key explanatory variable of interest is the geopolitical risk index (*Geopolitical risk*). A higher value of *Geopolitical risk* indicates that the IPO firm is likely to face greater ex-ante political uncertainty at the time of listing.

Our selection of firm-level control variables is in line with prior literature (e.g., Bajo et al. 2016; Colack, Durnev, and Qian 2017; Chemmanur and Yan 2017; Duong et al. 2021, 2022). At the IPO-level, the variable *Firm size* is calculated as the natural logarithm of the total assets of the IPO firm; *Profitability* is defined as earnings before interest and taxes, divided by total assets; *Leverage* is measured as the ratio of total debt over total assets; *Market-to-book* is calculated as market value of equity divided by the book value of equity; *Asset turnover* is calculated as sales divided by total assets; *IPO age* is the natural logarithm of the difference between the year of listing and year the firm was founded; *Underwrite reputation* is a dummy variable equal to one if the IPO is underwritten by a reputable underwriter, and zero otherwise; and *Bookbuilding* is a dummy variable equal to one if the IPO is through a bookbuilding method, and zero otherwise.

To mitigate the possibility that *Geopolitical risk* captures other country-specific characteristics observed at the country–year level, we control for variables reflecting economic, institutional, and financial development, as well as current economic conditions. Hence, following prior literature (Ellul and Pagano, 2006; Boulton et al., 2010, 2017; Chen et al., 2020a; Duong et al., 2021, 2022), we control for the state of the economy and the level of capital market development in the country where an IPO

takes place. Specifically, we include *IPO activity*, defined as the ratio of the number of IPOs issued in a year to the total number of firms listed in that country, and *Rule of law* which reflects the survey assessments regarding the quality of country-level law enforcement. We also include *Market return*, a country-specific benchmark value-weighted index return over the three-months preceding the offering, *GDP pc growth*, measured as growth in the annual gross domestic product (GDP) per capita, and *Market Size*, measured as the ratio of the annual total market capitalization of stocks traded to the GDP. We present the detailed definitions of the variables in Appendix.

2.3 Descriptive Statistics

We report the sample distribution in Table 1, where information regarding the number and proportion of IPOs, and the average *IPO underpricing* and *Geopolitical risk* for each of our thirty-five sample markets is presented. It is important to note here that we undertake our sample IPOs' country-allocation and the value of the geopolitical risk index based on the main stock exchange on which the IPO is first listed (rather than the IPO-company's country of incorporation). Our results show that just over half of the IPOs in our sample are concentrated in four markets: China, Hong Kong, Japan, and the U.S. On average, the *IPO underpricing* of our sample IPOs is 28.32%; most markets (26 out of 35) generate a below-average first-day return, but, for the rest of the markets, we observe some notably high IPO first-day returns; especially China and Japan. The values of the geopolitical risk index reveal a dispersed geopolitical uncertainty internationally, with developed markets (the U.S., the U.K., and France) exhibiting the top index scores, while some emerging markets (Russian Federation and China) also falling in the same league. On the contrary, some developed (Finland, Denmark, and Portugal) and emerging (Chile, Argentina, and Colombia) countries experience relatively low geopolitical risk, giving us. Hence, we observe an ideal distribution of developed–emerging market split, reflecting varying levels of *Geopolitical risk* in our sample.

[Insert Table 1 here]

Table 2 presents the summary statistics. The average (median) *IPO underpricing* of our IPO sample is 0.2832 (0.1217). The average (median) value of the *Geopolitical risk* is 0.6926 (0.2400), with most markets (27 out of 35) exhibiting values below the sample mean (as Table 1 illustrates). Our sample includes IPO firms with an average *IPO size* of \$64.53 million ($e^{4.1825}$ = 64.53). The average (median) *Profitability* and *Leverage* of our IPO sample is 0.0249 (0.0586) and 0.2453 (0.1752) respectively. Next, the average age of the IPO firm at the time of listing is 5.5 (= $e^{1.7102}$) years with a median of 7.0 years. A total of 46.01% of the IPOs have at least one reputable underwriter, and 62.95% use bookbuilding as pricing mechanism. The results reported in Table 2 are largely consistent with prior studies on international IPOs (Ellul and Pagano, 2006; Boulton et al., 2020; Chen et al., 2020a, 2022; Duong et al. 2021, 2020). Furthermore, the highest Variance Inflation Factor among the explanatory variables is 2.06, suggesting that multicollinearity is not a concern in our analysis.

[Insert Tables 2 here]

3. Empirical Analysis

3.1 Impact of geopolitical risk on IPO underpricing

Table 3 displays the results from regressions exploring the relation between *Geopolitical risk*, *IPO market* and *IPO underpricing*. We test this relation while simultaneously controlling for firm-level, macro-economic and state-specific characteristics. We also include industry, country, and year fixed effects to mitigate the time-invariant omitted-variable bias problem, and cluster the standard errors at the industry-year level. Panel A clearly indicates that firms exposed in areas with high geopolitical risk tend to experience lower level of IPO underpricing. Throughout all the specifications, we obtain significant negative coefficients related with the geopolitical risk, which appears to impair the investors' enthusiasm

in participating on new listings and its level brings negative impact on the investor's sentiment. Specifically, column 1 documents a strong, highly significant, and negative relation between geopolitical risk and the level of IPO underpricing. A one standard deviation (SD) increase in geopolitical risk reduces the level of IPO underpricing by 3.5%. This is an economically large effect, translating to a change of 8.09% of the mean underpricing in our thirty-five-country sample. In columns 2 and 3, after controlling for firm-specific and then also macro-level factors, higher geopolitical risk continues to significantly decrease the level of IPO underpricing at one percent level. Specifically, for a one SD increase in geopolitical risk, IPO underpricing decreases by 3.2% and 2.8%, respectively. The result remains robust to extensive controls, alleviating any endogeneity and sample selection concerns. Overall, the results are consistent with the sentiment hypothesis that, a greater degree of geopolitical risk exposure will impact the sentiment of market participants and will be associated with the reduced level of IPO underpricing.

The findings pertaining to the control variables are interesting. To start with, the coefficient for *Firm size* is negative, which is consistent with the idea that larger companies are associated with lower information asymmetry and hence less underpricing. Next, *Profitability* tends to increase initial returns for the investors. The coefficient for *Leverage* is negative, which is consistent with the notion that leveraged IPO firms can deem risky for the equity investors, resulting in lower investor interest, which translates into lower listing day returns. The coefficient on *Market-to-book* is positive. A possible explanation for this observation is that firms with superior investment opportunities attract market interest, and therefore higher listing day returns. Interestingly, IPOs underwritten by reputable underwriter also experience a positive first day return, since they are quite likely to be extensively marketed by their underwriters. Lastly, *Bookbuilding* is negatively related to underpricing, which opposes the predictions of Hanley (1993) and Lowry and Schwert (2002) that information production

during bookbuilding is associated with higher initial IPO returns. Overall, these results are largely in line with the literature (Ellul and Pagano, 2006; Boulton et al., 2010, 2017; Chen et al., 2020a, 2022).

Panel B shows a strong negative relationship between geopolitical risk and IPO activity as measured by both IPO activity (the total number of IPOs in the issue year divided by the number of listed firms for the country of listing) and IPO volume (the log-transformed total number of IPOs each year in the country of issuance). We run our regressions at the country-year level, and primarily control for the economic, governance, and institutional factors at the country-year level.

Colak et al (2017) document that IPO activity declines in the two-years before the election when the political uncertainty about the future governor and their perceived policies increases. In similar vein, our results demonstrate that with the increase in the geopolitical risk, there is a significant drop in IPO volume, i.e., both the IPO activity and the number of firms going public. Across geopolitical tensions, the decrease in the number of IPOs is larger when the geopolitical outcome is more uncertain. These results suggest the relationship between underpricing and geopolitical risk is complex as it depends also on the IPO market.

We address this concern by running a 2 stage least squares regressions. In the first stage, we use IPO activity as the dependent variable and geopolitical risk as our explanatory variable. In stage 2, we include the fitted IPO activity from Stage 1 as an explanatory variable in our underpricing regression. The results reported in Table 4 show that, after excluding the negative impact of the geopolitical risk on IPO activity, the relationship between underpricing and volume is, as expected, positive and significant and in line with the predictions of Khanna et al. (2008) model. The results are similar when we use IPO volume to proxy for the IPO market. While the magnitude of the coefficient of geopolitical risk is much larger, that of fitted volume is relatively small than that of the fitted IPO activity.

[Please Insert Tables 3 and 4 here]

3.2 Robustness checks

To eliminate the concern that the geopolitical risk geopolitical risk index is likely to capture the effect raised from other categories of uncertainty (e.g., macroeconomic uncertainty, financial market uncertainty or political uncertainty), which will confound the relation between the geopolitical risk and new listed firm's performance, we perform additional tests to include alternate model specification, proxies for underpricing, and geopolitical risk. We report the results in Table 5[8]. In Panel A, we conduct robustness test to control for alternative measurement of underpricing by using: (i) Closing Price 1 week after listing minus the Offer price; and (ii) Closing Price of Listing Day minus the Market return on the Day of Listing. The results of exploring the relation between geopolitical risk and alternate metrics for underpricing stay unchanged revealing significantly negative coefficients. Thus, geopolitical risk continues to carry an adverse impact on underpricing, which suggests that it affects investors' sentiments and the overall IPO activity.

In Panel B, we examine alternative proxies for geopolitical risk that might affect the likelihood of decreased underpricing. We first replace country-level geopolitical risk with Global Geo-Political risk index and construct the geopolitical risk by using two sub-indices – Geo-Political Threats Index and Geo-Political Acts Index as provided in the Matteo Iacoviello database. We use these two sub-indices separately in our baseline model. The results show that these three geopolitical risk proxy variables are all negative and significant, suggesting that none of the three alternative metrics would change the suppression impact of the geopolitical risk on the immediate aftermarket performance of IPOs. Overall, by controlling for other dimensions of geopolitical risk, it does not mitigate the concerns that geopolitical risk creates to the investors as it tends to trigger investors to move away from riskier assets like stocks

[8] For space considerations, we do not report the coefficients of the control variables, which remain relatively similar to the results in Table 3.

and towards perceived "safe" assets. The results are in line with existing studies (Baur and Smales 2020) which indicates that geopolitical uncertainty hurts financial markets and reduces real economic output.

In Panel C, we check for robustness of our results to alternate model specifications. We first check for different econometric specification by clustering the standard errors at country-year level, instead of industry-year level (as done in our baseline model). Table 1 shows that the US accounts for about 25% of our sample firms and, at the same time, has the highest average GPR. We test whether our results hold by excluding it. Next, we (3) exclude 5 countries with maximum volume of IPOs - US, China, Japan, HK, and India. Finally, we exclude IPOs from regulated industries - Utilities and Financial Institutions. Our results hold ground across all these robustness checks as geopolitical risk is constantly negatively and significantly related to underpricing.

[Insert Tables 5 here]

In our path to establish the robustness of our findings, we next explore how does geopolitical risk impact IPO underpricing in each individual country. Of the 35 countries, we exclude fourteen with less than 100 IPOs to get meaningful statistical results, leaving us with 22,913 IPOs across twenty-one countries. We categorise our IPOs by the country where the IPO takes place. Each country has a restricted regression performed using the full baseline specification. Panel A of Table 6[9] indicates that the impact of the geopolitical risk on IPO underpricing is not homogeneous across countries. First, while the impact is negative in all countries, except Sweden, the effect of GPR on IPO underpricing is statistically insignificant in Germany, Italy, Mexico, Philippines, and Sweden. It is also marginally significant in Australia, India, Indonesia, Malaysia, Taiwan, and Turkey, but more significant in Brazil, the UK, and the US. The level of the coefficient of GPR varies also across our countries. The results show that the

[9] For space considerations, we do not report the coefficients of the control variables, which are similar to the results in Table 3.

underpricing of IPOs in Brazil, Taiwan, and Turkey is relatively more affected by Geopolitical Risk. Economically a one standard deviation increase in geopolitical risk increases underpricing by up to 8.6%, 10.2%% and 17.4% in Brazil, Taiwan, and Turkey, respectively. However, it is the smallest in the U.S.A., U.K., India, France, and China.

Next, in Panel B of Table 6, we investigate which specific industries exhibit a greater degree of IPO underpricing from exposure to geopolitical risk. The full IPO sample is categorised into twelve industries based on Fama-French 12-industry classification, and we observe that Business Equipment, Wholesale and Healthcare are among the worst impacted industries by geopolitical risk. The largest impact occurs in the business equipment, where economically a one standard deviation increase in geopolitical risk reduces IPO underpricing by 7.9%. Besides, Telecom and Utilities, all the other ten industries exhibit a negative relationship between IPO underpricing and geopolitical risk. The effect is insignificant for Telecom and Utilities sector. Lastly, in Panel C of Table 6 we test the impact of geopolitical risk on IPO underpricing in five-year windows starting from 1990 to 2020. The baseline negative relationship holds for all the five-year windows, except for the five year period 2006 to 2010, which is characterised by macro-economic boom and bust cycle, and when, we believe that, the Global Financial Crisis of 2008 to 2010 during this period took precedence over geopolitical risk. We accounted for these effects country, industry and yearly effects in all our regressions.

[Insert Tables 6 here]

3.3 Instrumental variables analysis

To address the possibility that an omitted variable bias affects our results, in Table 7 we perform a two–stage instrumental variable (IV) approach. This approach requires an instrumental variable that is correlated with geopolitical risk but is uncorrelated with the IPO process. We use as an instrument for geopolitical risk the religious tension index provided by the International Country Risk Guide (ICRG).

According to ICRG, religious tensions stem from specific religious groups seeking to dominate the social, political and governance process of the country. The British Academy (2015) reveals that religious impulses have long inspired movements for social and political change, both peaceful and violent, causing geopolitical threats. This implies that the religious tension instrument is likely to satisfy the relevance requirement of instrumental variables. Simultaneously, IPO listing decisions are less likely to be directly correlated to religious tension, satisfying the exclusion condition of instrumental variables.

To perform the IV analysis, in the first stage, we regress country-level geopolitical risk index on the religious tension index as well as on all other firm–level control variables used in the baseline model. We find a strong positive relation between the religious tension index and geopolitical risk that is significant at the 1% level. In the second stage, we run the same probit regression as in stage 1. We document that the relation between geopolitical risk and IPO underpricing is significantly negative. This result, combined with our extensive set of controls, helps alleviate endogeneity concerns ensuring for the robustness of the obtained negative relation.

[Insert Tables 7 here]

3.4 The moderating effect of information asymmetries of the issuing firm

Previous studies identified several factors that mitigate the level of IPO information asymmetries, leading to lower underpricing. We report the results in Table 8[10]. Panel A, tests for the moderating effect of third-party certification of the issuing firm. Certification is the process where certain identifications verify the legitimacy and competency of a business to perform a particular outcome. In our context, certification factors will be those associated with the competency of IPO pricing. The factors of our interest include underwriter reputation, number of underwriters and recruitment of a big 4 auditor at the

[10] For space considerations, we do not report the coefficients of the control variables, which remain relatively similar to the results in Table 3.

time of IPO to assist the firm with listing. Earlier evidence by Carter and Manaster (1990), Carter, Dark and Singh (1998) and Carter and Mohan (2002) reveal that IPOs managed by more reputable underwriters experience lower level of IPO underpricing. Reputational capital is a valuable asset for underwriters in IPO markets with existing measures of their reputation tailored to the US market, where the same established investment banks typically handle IPOs. *Underwriter reputation* acts as a proxy for the quality of the underwriter's ability and we measure it with a dummy variable equal to one if the investment bank underwriting the IPO is in the top quartile based on combined IPO proceeds raised, and 0 otherwise. We combine the underwriter reputation variable with the geopolitical risk and find that the resulting interaction variable is positively related to underpricing, which indicates that the prestigious underwriters work as a mediating factor on investors sentiment. Underwriters, play a certification role in the IPO process as they have strong incentives to improve the first day returns for their clients.

Next, we go a step further and we control for the N*umber of underwriters* involved in the process. The results shows that a greater number of underwriters, the lower the underpricing, in line with Khanna et al (2008) predictions that more underwriters, increase the IPO scrutiny and firm valuation. The interaction variable with geopolitical risk is positive and significant, suggesting that underwriters mitigate the impact of geopolitical risk on IPO underpricing. An explanation is that involvement of large number of underwriters during the periods of elevated geopolitical risk can lead to better IPO valuation, attract more investors, which in process can lead to achieving a higher level of investor interest on the listing day.

In Table 8, Panel A, we also use the appointment of a reputable (*i.e.*, one of the Big 4) auditor, as a way of mitigation IPO information asymmetry risk. The results show that IPO underpricing is negatively related to Big 4 auditor, but marginally statistically significant. However, the interaction between the indicator for geopolitical risk and auditor reputation is positive and significant, suggesting

that the effect of heightened geopolitical risk on IPO first-day returns is attenuated if the IPO firm is audited by a *Big 4 auditor*.

Table 8, Panel B, tests for other firm specific information asymmetries effects. Since the geopolitical risk foreshadows lower investment and employment and is associated with higher disaster probability, and larger downside risks, it is pertinent to examine how its impact on underpricing varies with firm level indicators that shape a company's exposure to exogenous shocks. If the geopolitical risk is a valid measure of information asymmetry, its effect on underpricing should be more pronounced in firms exposed to the threat, realization, and escalation of adverse events associated with wars and any tensions that affect the peaceful course of international relations (Caldara and Iacovello, 2022). To examine this conjecture, we consider five firm level characteristics: (i) the Logarithmic transformation of total assets of the IPO firm (*Firm size*), (ii) the difference in years since the firm was established up to the year of listing (*IPO age*), (iii) the decision of parent company to partially divest one of its business units by selling minority interests (*Carve-outs*) (iv) when the IPO firm operates in more than one industry (*Diversification*) and (v) disclosure of the specific purpose or rationale behind raising IPO proceeds (*Proceeds use*). Inherently, these five factors should assist in reducing the level of information asymmetry for the firms at the time of going public, hence reducing the IPO underpricing problem. While in conjunction with geopolitical risk, the negative effect of the geopolitical risk on IPO first-day returns should be mitigated for IPO firms with relatively lower specific information asymmetries.

The results show that the coefficients of *Geopolitical risk* remain negative and significant throughout our specifications. The interaction variables are all positive and significant, suggesting that our measures of IPO firms' idiosyncratic information asymmetries proxy variables mitigate the impact of geopolitical risk on IPO underpricing, in favor of investors sentiment. In particular, the positive and significant effect of *Geo-Political Risk * Firm size* on underpricing suggests that investors are interested

in IPOs from large firms during increased geopolitical uncertainty and hence higher underpricing. *IPO age* becomes insignificant when we introduce its interaction with geopolitical risk, whose coefficient is positive, suggesting that the positive impact of age on underpricing is mitigated in the presence of geopolitical risk, which is consistent with the notion that mature companies involve lower level of information asymmetry, hence increased investor interest at the time of listing during uncertain times. Similarly, the information content of the interaction effect of geopolitical risk and carve outs is, as expected, positive and significant, since these types of IPOs have relatively lower information asymmetries. Since their parent companies disclose their financial information, the coefficient of *Carve-out* is negative and significant, but the idea of divesting a business unit away from an area during the period of high geopolitical risk will be appreciated by the investors and will receive a positive investment plan intention. It is also worth noting that the interaction between geopolitical risk and *Diversification* is positive and highly significant. This indicates the operational advantage of IPO firms functioning in more than one industry at the time of listing. Among the advantages of these strategies in uncertain time and during geopolitical tensions is that managers can help investors diversity and mitigate market volatility caused by geopolitical eruptions. Finally, we also observe IPO firms that explicitly disclose about the use of their proceeds when listed during periods of high geopolitical risk have a positive effect on their listing day return. This relation is primarily driven by the alleviated information asymmetry of such IPOs, hence leading to investor interest during uncertain times.

[Insert Tables 8 here]

3.5. Effect of regulatory reforms on geopolitical risk

We extend our analysis to assess the moderating effect of the strength of country-level external governance mechanisms using various factors. We first analyze the effects of regulatory reforms

introduced at country-level, and then assess the impact of various external governance and level of institutional quality at country-level. We report the results in Table 9[11].

The aspect of regulatory reforms around IPOs and to a broader extend on all enterprises, is an ongoing process as the priority of the authorities remain to improve investors protection and to secure the smooth operation of the markets. Increasing incidents of financial threats and scandals resulted on significant reforms (*i.e.*, Sarbanes-Oxley Act, Dodd Frank Wall Street Reforms) which has led to increased transparency and disclosure by public companies to provide investors with the critical information needed to determine whether they want to buy in, and at what price. To examine the effect of regulatory reforms, we categorize them in three broad categories: (i) the emphasis on improving board practices and imposing or recommending greater board independence (*Boardroom reform*), (ii) mandating the use of International Financial Reporting Standards (*IFRS adoption*), (iii) the introduction of antitrust legislation to discourage further the formation and stability of illegal cartels (*Leniency legislation*). We assume that the introduction of regulatory reforms at country-level will mitigate the exposure to geopolitical risks.

Insights from this literature, Chen et al. (2002) suggest that by strengthening board oversight in IPO firms, board reforms should play a material role in the pricing of the new issues. Fauver et al., (2017) argue that common emphasis of boardroom reforms is that stronger board oversight arising from increased board independence curbs the opportunistic behaviour of managers and improves the integrity and transparency of financial reporting. They also suggest that by improving board governance, board reforms should encourage firm management to invest in projects that benefit all shareholders, therefore improving investment efficiency. In our setting, the geopolitical threats should be mitigated by a reliable

[11] We also do not report the coefficients of the control variables, which remain relatively similar to the results in Table 3, for space considerations.

and independent board of directors that has resulted from boardroom reforms creating trust and euphoria among the investors.

The results in Model 1 of Table 9, Panel A, show that *Board reform* is negatively related to underpricing, but as above, the interaction between geopolitical risk and *Boardroom reforms* mitigates this effect; it alters investors sentiment as the coefficient turns positive, indicating the critical role of the reforms towards creating the ideal board structure in periods of geopolitical upheavals. We find that geopolitical risk is associated with an increase in underpricing by *circa* 2.0%, in boards that have followed processes of reforms. These results confirm that investors appreciate continuous board improvements aiming in superior governance decisions during periods of high geopolitical risk.

Following Byard, Darrough and Suh (2021), we examine the impact of *IFRS adoption* on IPO underpricing to proxy for increasing transparency and disclosure for IPO firms. This regulatory reform also includes (1) adoption of the Prospectus Directive, which mandated increased IPO prospectus disclosures and (2) increased accounting enforcement. Although we find a significant decrease in IPO underpricing associated with adoption of the Prospectus Directive in countries that also increased accounting enforcement the interaction with geopolitical risk has beneficial action in the new listed issues as the increasing disclosure enhanced investors' confidence which translated to an increased listing day return for the investors.

Investigation of regulatory reforms continues with the examination of *Leniency legislation* which grant immunity to the cartel members who collaborate with the antitrust authorities and epitomises the anti-collusion laws that have been passed around the globe. From a theoretical perspective the effect of *Leniency legislations* on the underpricing of new issues is ambiguous (Duong, Goyal and Zolotay, 2022; Dasgupta and Žaldokas, 2019). On the one hand, there are potent reasons to expect that leniency legislations reduce IPO underpricing. Specifically, Bourveau et al. (2020) report that following the

passage of antitrust laws, firms start sharing more detailed information in their financial disclosure about their customers, contracts, and products. Further, the passage of leniency laws increases competition in the product market (Dasgupta and Žaldokas 2019; Bourveau et al. 2020). Our result for a negative first-day return suggests that leniency legislations may act as a disciplinary mechanism and discourage management of the issuing firms from opportunistically underpricing IPOs. The positive interaction with geopolitical risk indicates the importance of the adoption of leniency programs on mitigating managerial agency problems and reducing the associated agency costs stemming from managers leading to higher listing day returns.

Table 9, Panel B assesses the effect of external governance characteristics on geopolitical risk. Understanding governance requires exploring not only of how an individual governance mechanism works but also how different governance mechanisms interact to mitigate or, in some circumstances, exacerbate agency problems (Kim and Lu, 2011). Strong external governance leaves less room for agency problems that can be mitigated by incentive effects. It may also preclude the management from expropriating shareholder value by holding them accountable for performance, thereby weakening the risk-reducing effect.

To examine governance characteristics impact on geopolitical risk, we consider five specifications which reveal the moderating effect of the strength of country-level external governance mechanisms: (i) Country-specific anti-director self-dealing rights (*Shareholder rights*), (ii) the asymmetric timeliness of earnings declines with managerial ownership (*Accounting conservativism* – Bushman and Piotroski, 2006; Boulton et al. 2017), (iii) democratic development as a general institutional umbrella that primarily encompasses changes in constitutional characteristics of democracy, such as a system of free elections, the evolution of checks and balances by independent political bodies, and the evolution of civil liberties (*Democracy* – Delis et al., 2020; Duong et al., 2022) (iv) a concept

that captures law, individual rights and high quality government regulation and services (*Institution quality)* and (v) the ability of journalists to report freely on matters of public interest in a country (*Press freedom*). We expect the mitigating effect of external governance and level of institutional quality at country-level on geopolitical risk.

Shareholder rights are the legal entitlements of shareholders in the firms where they invest. A large body of research has investigated how shareholder rights foster accountability of managers. Without accountability, managers and dominant shareholders are likely to use their power to further their own interests at the expense of outside minority investors. The calibration and impact of shareholder rights depends crucially on the institutional channel(s) through which they are implemented—voting, litigation, and/or market pricing. The protection of shareholders rights is critical in periods of economic turbulence and high geopolitical risk to maintain stability in the markets.

In Model 1, we perform an analysis examining the impact of the interaction of shareholder rights with geopolitical risk on IPO underpricing. The results show that well established anti-director self-dealing rights contribute on mitigating the geopolitical risk, and this is being rewarded with positive IPO returns. This finding also provides a mechanism through which geopolitical risk is not a threat for IPO investments but an overtaking problem.

Accounting conservatism, one of the fundamental features of accounting information is debatable among researchers and standard setter as to how costly or beneficial is to financial statement users. Geopolitical risk provides us an ideal context in order το provide further input to this debate. As expected, we find that accounting conservativism has a negative and statistically significant association with IPO underpricing. Interestingly, its interaction with geopolitical risk in Model 2 turns beneficial to the issuer, the investors and market makers as accounting conservatism acts as an efficient contracting mechanism, and helps alleviate the pessimistic environment, leading to the positive IPO underpricing. Thus,

conservating accounting can act as a mechanism for the firm to follow during periods of high geopolitical risk to surpass market pessimism.

The challenges of democracy around the world with numerous leaders changing the constitution to remain in power for longer than initially permitted has spurred a vast literature on the costs and benefits of democracy with respect to economic outcomes. The change of the constitution and the concentration of power makes the leaders abandon the fundamentals of democracy and to start behaving aggressively. This is likely to increase geopolitical risk at international level, lading to massive problems in global trade, increasing the energy prices, threatening nations security, and damaging political relations. This challenge is tested in Model 3 and the results reveal that when geopolitical risk is interacted with the level of institutional democracy in the country at the time of listing, IPO underpricing turns positive and significant, securing good returns to the investors.

Institutions quality of contract enforcement, shareholder protection, property rights, have received a great deal of attention in recent years. Better institutional quality plays a pivotal role in ensuring the ability of financial institutions to facilitate efficient borrowing, hence, prevent credit divergence to unproductive investment activities. The level of institutional quality drives the growth of financial development (Law, Asman Saini and Ibrahim, 2013). Levine (1997) argues that financial intermediaries, the entities that serve on achieving institutions quality, enhance economic efficiency, and ultimately economic growth, by helping allocate capital to its best uses. To investigate the impact of institutions quality during period of elevated geopolitical risk, we interact these two variables in Model 4. The results indicate that institutions quality contributes on alleviating the impact of geopolitical risk and drives to positive IPO listing day returns.

Press freedom, the ability of journalist to report freely on matters of public interest is under continuous scrutiny and threat. In the financial markets, lack of press freedom reduces the amount of

firm-specific information contained in stock prices, thereby making stock prices less informative (Kim et al., 2013). The '*financial*' press has the critical role during the IPO process to establish informational communication between the issuer and the investors (Chen et al., 2020a). The processes that are more transparent lower the information asymmetry, resulting in less money left on the table. The role of media freedom is particularly important during period of geopolitical tensions. The normal practise during wars, terrorist acts, and tensions between states is the spread of fake news. This motivated us to explore the interaction between geopolitical risk and press freedom in Model 5. The results show that the existence of free press during periods of higher levels of geopolitical risk at the time of listing is related with positive returns for the investors.

[Insert Table 9 Here]

3.6. Impact of geopolitical risk on different IPO outcomes

We proceed our empirical section by replacing IPO underpricing with a broad range of other IPO characteristics to examine how the level of "investor interest" in an IPO prior to its issue have been affected by geopolitical risk in Table 10. We consider six IPO process characteristics and outcomes. We specifically focus on: (i) total proceeds raised by the IPO firm (in millions of U.S. dollars) at the time of listing (*Offer* size), (ii) Regular shares issued to the public for trading divided by the total number of outstanding shares *(IPO float),* (iii) Difference between the IPO offer price and the mid-point of the initial filing range, divided by the mid-point of the initial filing range *(Price revision),* (iv) Listing-day total trading volume scaled by the total shares issued by the IPO firm at the time of listing *(Trading volume),* (v) The total number of specific purpose(s) disclosed by the IPO firm in the IPO prospectus as behind raising IPO proceeds *(Number of proceeds use),* and (vi) Total fee charged by the investment bank(s) underwriting the IPO, divided by the total proceeds raised in the IPO. *(Underwriter fee).* We expect that while *Offer size, IPO float, Price revision* and *Trading volume* would be negatively affected

by the geopolitical risk, but the *Number of proceeds use* and *Underwriter fee* should increase during periods of high geopolitical uncertainty.

Firms may scale up the size of an offer by issuing more primary shares to finance the investment in growth opportunities (e.g., Kim and Weisbach, 2008; Aslan and Kumar, 2011), IPO offer size is a multifaceted concept. To the issuing firm and its selling shareholders, it represents the proceeds raised in the offering and received by them. To transactors, offer size equals the dollar value of shares collectively traded in the primary market. By mitigating the friction costs of trading, a larger offer size will increase prices and lower the returns required to offset the real costs of liquidity provision (Stoll, 2000; Amihud, 2002; Brockman and Yan, 2009). Additionally, a larger offer size may reduce the risk of informed trading, alleviate information asymmetries between insiders and liquidity providers, and induce lower levels of required underpricing (e.g., Beatty and Ritter, 1986; Michaely and Shaw, 1994). We perform test to examine the impact of geopolitical risk on offer size. The results in Model 1 show that *Geopolitical risk* reduces the magnitude of the offer size causing threat for IPO investments. This finding provides evidence that geopolitical risk can be a constraint for investors to participate in the IPO market, and hence adversely affect the planning by issuers and investment activity by investors.

To straighten out the size effect, we normalize offer size by the market value of the IPO firm based on the offer price. The resulting free float equals the number of shares sold in the IPO relative to the number of shares outstanding. Pham et al. (2003) provide empirical evidence in support of the hypothesis that IPOs with relatively more floating shares will have higher aftermarket liquidity. We proceed and test how geopolitical risk affect floating of shares in Model 2. Findings shows a decreasing trend and geopolitical risk reduces the free float and regular shares issued to the public for trading.

A very substantial component of IPO first-day returns is the degree to which underwriters upwardly/downwardly adjust the offer price relative to the mid-point of the initial IPO filing price range

(Hanley, 1993; Aggarwal and Conroy, 2000; Lowry and Schwert, 2002). Price revision is a signalling mechanism of the percentage change over the mean of the offer price as the higher the uncertainty surrounding the IPO's valuation, the more likely new information (positive or negative) revealed during the pricing process will have a significant impact in offer price revisions. As expected, Model 3 shows that IPOs issued during period of high geopolitical risk have negative offer price revisions.

At the time of issuance, the true level of investors' interest becomes known and is reflected in the stock's initial trading volume (Nimalendran et al., 2007). IPOs with high level of interest tend to experience high level of trading volume and positive initial returns. High investor interest, high initial trading volume and a high initial return all encourage the production of information, brokerage and market making services. This reinforces the interest in the stock and as more investors continue to follow the issue, it experiences higher trading volume than those with lower level of investor interest. The challenge for the level of trading volume appears to be the geopolitical risk which may impact the investors interest. Our results in Model 4 indicates that geopolitical risk deeply impact trading volume and reduces the activity around IPO issuance.

When a company files to go public it must, in accordance with local commissions rules, is mandatorily required to disclose the uses to which it intends to apply the IPO proceeds. Leone et al (2007), suggest that IPOs that provide specific use-of-proceeds disclosures have less ex-ante uncertainty, in the sense that these disclosures help investors estimate the dispersion of secondary market values, and higher the disclosure, better the dissemination of information about the firm going public. Managers of IPO firms do not want to over-promise to investors, primarily to avoid heightened expectations of the markets. However, as evidenced in Model 5Although, those that go public during periods of high geopolitical risk are likely to increase the disclosure of the total number of specific purposes behind raising IPO proceeds in the prospectus to attract investors and to assist them in evaluating the IPO, while

simultaneously narrowing their estimate of the dispersion of the stock's secondary market value post listing.

Lastly, if an issuer who desires to reduce the amount of money left on the table, and also aims to stabilize the market value post-listing is likely to be requested by the underwriter to pay more in underwriting fee. Chen and Ritter (2000) suggest that the underwriting fees is on average seven percent of proceeds. The seven percent has risen as a focal point partly because issuers have placed relatively little attention on fees, and underwriters find it easy to justify a given spread by pointing to previous deals done at the same spread. Livingston and Williams (2007) reveal a decrease in fees and suggests that this was largely a result of the increase in competition in the IPO underwriting market. In Model 6 we consider the impact of geopolitical risk on underwriter fee and find that the firms going public during uncertain period needs to shell out a larger portion of their proceeds as *Underwriter fee* to their underwriters for a successful IPO.

[Insert Table 10 here]

4 Conclusions

We confirm that geopolitical uncertainty and trade tensions heavily impacted the IPO landscape, pushing overall IPO activity down in terms of both deals and proceeds. However, unlike the information asymmetries/signalling hypotheses that predict an increase in underpricing to compensate investors for the higher risk, we find a negative relationship between geopolitical risk and underpricing. Further analysis reveals that geopolitical risk affects first the IPO market as measured by IPO activity and volume of IPOs, which, in turn, is negatively related to IPO underpricing. We use 2SLS method to account for these effects. We find that the fitted IPO market is positively related to underpricing, in line with Khanna et al. (2008) predictions.

we motivate our study by the immense impact of geopolitical risk with its increasing challenges on managers and investors. Drawing on a new metric developed by Caldara and Iacoviello (2022), we provide robust evidence that geopolitical risk has a negative impact on global IPO activity and IPO first day return. Our results hold for various measures of other IPO outcomes, several robustness checks, and after accounting for various controls. Overall, our results highlight the effect of investor sentiment, driven by macro-economic factors, in shaping IPO underpricing and outcomes.

The negative relation between geopolitical risk and initial returns activity lends support to sentiment hypothesis and opposes the information asymmetries which would predict a higher underpricing. We provide some factors that mitigate this impact, including firm specific factors such as the third-party certification, and the information asymmetry of the issuing firm, and macro-economic factors including the cross-country regulatory reforms, and the strength of country-level external governance mechanisms. Moreover, by decomposing the GPR index into the geopolitical threats index (GPT) and the geopolitical acts (GPA) index, we identify that the relation between GPR and IPOs is driven by both the threat of adverse geopolitical events and their realization.

Finally, in a period characterized by important geopolitical events across the globe, enterprises can proactively manage the threats that escalating international and internal political tensions pose to their operations, performance, and culture. On the basis that US National Intelligence Council's report that competition for global influence is likely to reach its highest level since the Cold War, corporate decision–makers, who are responsible for assessing different risks and uncertainties that may affect strategically important investment decisions like IPOs, should pay particular attention on the impact of geopolitical risk and its effects on investment and shareholder value.

References

Aggarwal, R.K., Purnanandam, A.K. and Wu, G., 2005. Underwriter manipulation in IPOs. Unpublished working paper. University of Minnesota and University of Michigan.

Aggarwal, R. and Conroy, P., (2000). Price Discovery in Initial Public Offerings and Role of the Lead Underwriter, Journal of Finance, 55, 6, 2903-2922

Amihud, Y. 2002, Illiquidity and Stock Returns: Cross-Section and Time-Series Results. Journal of Financial Markets, 5, 31–56.

Aslan, H. and Kumar, P., 2011. Lemons or cherries? Growth opportunities and market temptations in going public and private. Journal of financial and Quantitative Analysis, 46(2), 489-526.

Bajo, E., Chemmanur, T.J., Simonyan, K. and Tehranian, H., 2016. Underwriter networks, investor attention, and initial public offerings. Journal of Financial Economics, 122(2), 376-408.

Baur, D.G. and Smales, L.A., 2020. Hedging geopolitical risk with precious metals. Journal of Banking & Finance, 117, p.105823.

Beatty, R. P. and Ritter, J. R., 1986. Investment banking, reputation, and the underpricing of initial public offerings. Journal of Financial Economics 15 (1), 213–232.

Benveniste, L. and Spindt, P., 1989. How investment bankers determine the offer price and allocate new issues. Journal of Financial Economics 24(2): 343-361.

Boeh, K. and Dunbar, C., 2014. IPO waves and the issuance process. Journal of Corporate Finance, 25, 455-473.

Boulton, T.J., Smart, S.B. and Zutter, C.J., 2010. Acquisition activity and IPO underpricing. Financial Management, 39(4), 1521-1546.

Boulton, T.J., Smart, S.B. and Zutter, C.J., 2017. Conservatism and international IPO underpricing. Journal of International Business Studies, 48(6), 763-785.

Bourveau, T., She, G. and Žaldokas, A., 2020. Corporate disclosure as a tacit coordination mechanism: Evidence from cartel enforcement regulations. Journal of Accounting Research, 58(2), 295-332.

Bradley, D. and Jordan, B. D., 2002. Partial adjustement to public information and IPO undepricing. Journal of Financial & Quantitative Analysis 37(4): 595-616.

Bradley, D., Kim, I. and Krigman, L., 2015. Top VC IPO underpricing. Journal of Corporate Finance, 31, 186-202.

Brau, J. and Fawcett, S., 2006. Initial public offerings: An analysis of Theory and Practice. Journal of Finance 66(1): 339-436.

Brockman, P. and Yan, X.S., 2009. Block ownership and firm-specific information. Journal of Banking & Finance, 33(2), 308-316.

Bushman, R.M. and Piotroski, J.D., 2006. Financial reporting incentives for conservative accounting: The influence of legal and political institutions. Journal of accounting and economics, 42(1-2), 107-148.

Byard, D., Darrough, M. and Suh, J., 2021. Re-examining the impact of mandatory IFRS adoption on IPO underpricing. Review of Accounting Studies, 26(4), 1344-1389.

Caldara, D., Iacoviello, M., 2022. Measuring Geopolotocal Risk American Economic Review 112, 1194–1225

Cartel Regulation 2021 Guidebook https://www.dechert.com/knowledge/publication/2021/1/cartel-regulation-2021.html

Carter, R. and Manaster, S., 1990. Initial public offerings and underwriter reputation. the Journal of Finance, 45(4), 1045-1067.

Carter, R.B., Dark, F.H. and Singh, A.K., 1998. Underwriter reputation, initial returns, and the long-run performance of IPO stocks. The journal of finance, 53(1), 285-311.

Chen, C.R. and Mohan, N.J., 2002. Underwriter spread, underwriter reputation, and IPO underpricing: A simultaneous equation analysis. Journal of Business Finance & Accounting, 29(3-4), 521-540.

Chemmanur, T. and Yan, A., 2017. Product market advertising, heterogeneous beliefs, and the long-run performance of initial public offerings. Journal of Corporate Finance, 46, 1-24.

Chen, Y., Goyal, A., Veeraraghavan, M. and Zolotoy, L., 2020a. Media coverage and IPO pricing around the world. Journal of Financial and Quantitative Analysis, 55(5), 1515-1553.

Chen, Y., Goyal, A., Veeraraghavan, M. and Zolotoy, L., 2020b. Terrorist attacks, investor sentiment, and the pricing of initial public offerings. Journal of Corporate Finance, 65, p.101780.

Chen, Y., Goyal, A. and Zolotoy, L., 2022. Global board reforms and the pricing of IPOs. Journal of Financial and Quantitative Analysis, 57(6), 2412-2443.

Chen, H.-C., and Ritter, J.R., 2000. The Seven Percent Solution. The Journal of Finance 55, 1105-1131

Chowdhry, B. and Nanda, V., 1996. Stabilisation, syndication and pricing of IPO's. Journal of Financial and Quantitative Analysis 31: 25-42.

Colak, G., Durnev, A., and Qian, Y., 2017. Poilitical uncertainty and IPO Activity: Evidence from U.S. Guernatorial Elections Journal of Financial and Quantitative Analysis, forthcoming 52, 2523-2564

Dasgupta, S. and Žaldokas, A., 2019. Anticollusion enforcement: Justice for consumers and equity for firms. The Review of Financial Studies, 32(7), 2587-2624.

Delis, M.D., Hasan, I. and Ongena, S., 2020. Democracy and credit. Journal of Financial Economics, 136(2), 571-596.

Duong, H.N., Goyal, A., Kallinterakis, V. and Veeraraghavan, M., 2021. Market manipulation rules and IPO underpricing. Journal of Corporate Finance, 67, p.101846.

Duong, H.N., Goyal, A., Kallinterakis, V. and Veeraraghavan, M., 2022. Democracy and the pricing of initial public offerings around the world. Journal of Financial Economics, 145(1), 322-341.

Duong, H.N., Goyal, A. and Zolotoy, L., 2022. Anti-Collusion Leniency Programs and the Pricing of IPOs: International Evidence. Available at SSRN 4025787

Ellul, A. and Pagano, M., 2006. IPO underpricing and after-market liquidity. The Review of Financial Studies, 19(2), 381-421.

EY, 2022. The EY Global IPO Trends 2022. https://www.ey.com/en_gl/ipo/trends

Fauver, L., Hung, M., Li, X. and Taboada, A.G., 2017. Board reforms and firm value: Worldwide evidence. Journal of Financial Economics, 125(1), 120-142.

Hanley, K.W., 1993. The underpricing of initial public offerings and the partial adjustment phenomenon. Journal of financial economics, 34(2), 231-250.

Hong, H.A., Hung, M. and Lobo, G.J., 2014. The impact of mandatory IFRS adoption on IPOs in global capital markets. The Accounting Review, 89(4), 1365-1397.

Khanna, N., Noe, T. H. and Sonti, R., 2008. Good IPOs draw in bad: Inelastic banking capacity and hot markets. Review of Financial Studies 21(5), 1873–1906.

Kim, E.H. and Lu, Y., 2011. CEO ownership, external governance, and risk-taking. Journal of Financial Economics, 102(2), 272-292.

Kim, J.B., Zhang, H., Li, L. and Tian, G., 2014. Press freedom, externally-generated transparency, and stock price informativeness: International evidence. Journal of Banking & Finance, 46, 299-310.

Kim, W. and Weisbach, M.S., 2008. Motivations for public equity offers: An international perspective. Journal of Financial Economics, 87(2), 281-307.

Kunčič, A., 2014. Institutional quality dataset. Journal of institutional economics, 10(1), 135-161.

Law, S.H., Azman-Saini, W.N.W., and Ibrahim, M.H., 2013. Institutional quality thresholds and the finance – Growth nexus. Journal of Banking & Finance 37, 5373-5381

Leone, A., Rock, S., and Willenborg, M., 2007. Disclosure of intended use of proceeds and underpricing in Initial Public Offerings. Journal of Accounting Research 45, 1081-1114.

Levine, R., 1997. Financial development and economic growth: views and agenda. Journal of economic literature, 35(2), 688-726.

Liu, X. and Ritter, J., 2010. The Economic Consequences of IPO Spinning, Review of Financial Studies 23(5): 2024-2059.

Liu, X. and Ritter, J.R., 2011. Local underwriter oligopolies and IPO underpricing. Journal of Financial Economics, 102(3), 579-601.

Livingston, M., and Williams, G., 2007. Drexel Burnham Lambert's bankruptcy and the subsequent decline in underwriter fees. Journal of Financial Economics 84, 472-501.

Ljungqvist, A., 2007. IPO underpricing. In: Eckbo B (ed.) Handbook of Corporate Finance: Empirical Corporate Finance. Elsevier Amsterdam.

Loughran, T. and Ritter, J., 2002. Why don't issuers get upset about leaving money on the table of IPOs? Review of Financial Studies 15: 413-443.

Loughran, T. and Ritter, J., 2004. Why has IPO underpricing changed over time? Financial Management 33(3): 5-37.

Loughran, T. and McDonald, B., 2013. IPO first-day returns, offer price revisions, volatility, and form S-1 language. Journal of Financial Economics 109 (2), 307–326.

Lowry, M., Michaely, R. and Volkova, E., 2017. Initial public offerings: A synthesis of the literature and directions for future research. Forthcoming Foundations and Trends in Finance.

Lowry, M. and Schwert, G.W., 2002. IPO market cycles: Bubbles or sequential learning?. The Journal of Finance, 57(3), 1171-1200.

Michaely, R. and Shaw W. H., 1994. The pricing of initial public offerings: Tests of adverse-selection and signaling theories. The Review of Financial Studies 7 (2), 279– 319.

Nimalendran, M., Ritter, J.R., and Zhang, D., 2007. Do today's trades affect tomorrow's IPO allocations? Journal of Financial Economics 84, 87-109

Pham, P. K., Kalev, P. S. and Steen A. B., 2003. Underpricing, stock allocation, ownership structure and post-listing liquidity of newly listed firms. Journal of Banking & Finance 27 (5), 919–947

Center for Systematic Peace, 2018. Polity5 Project (2018). Available at: https://www.systemicpeace.org/polityproject.html

Rajan, F. and Sarvaes, H., 1997. Analyst following of initial public offering. Journal of Finance 52: 507-529.

Ritter, J.R. and Welch, I., 2002. A review of IPO activity, pricing, and allocations. The journal of Finance, 57(4), 1795-1828.

Rock, K., 1986. Why new issues are underpriced. Journal of Financial Economics 15(1-2): 187-212.

Spamann, H., 2010. The “antidirector rights index” revisited. The Review of Financial Studies, 23(2), 467-486.

Stoll, H. R. 2000, Friction. Journal of Finance, 55, 1479–1514

Yung, C., Çolak, G. and Wang, W., 2008. Cycles in the IPO market. *Journal of Financial Economics*, *89*(1), 192-208.

Appendix. Variable definitions and data sources

Accounting conservatism: Country-specific accounting conservatism score. Source: Bushman and Piotroski (2006); Boulton et al. (2017).

Asset turnover: Sales divided by total assets of the IPO firm at the time of listing. Source: Worldscope.

Big 4 auditor: Dummy variable equal to 1 if the IPO firm is audited by a Big 4 auditing firm, and 0 otherwise. Source: SDC Platinum.

Boardroom reform: Dummy variable equal to 1 if the IPO takes place during or after the year of major board reform in the country of issuance, and 0 otherwise. Source: Chen et al. (2022).

Bookbuilding: Dummy variable equal to 1 if IPO uses bookbuilding, and 0 otherwise. Source: SDC Platinum.

Carve-out: Dummy variable equal to 1 if the IPO firm is a carve-out of a publicly listed firm, and 0 otherwise. Source: SDC Platinum.

Democracy: Country-specific indicator variable on a scale of 0 to 10, with zero indicating no institutional democracy, and 10 indicating a maximum level of institutional democracy. Source: Center for Systematic Peace (2018).

Diversification: Dummy variable equal to 1 if the IPO firm operates in more than one industry (based on the unique SIC codes) at the time of listing. Source: SDC Platinum / Worldscope

Firm size: Logarithmic transformation of total assets of the IPO firm (in millions of U.S. dollars) at the time of listing. Source: SDC Platinum / Worldscope.

GDP pc growth: Country-specific GDP per capita growth in the year of the IPO firm listing. Source: World Bank WDI.

Geopolitical acts: The actual realization of geopolitical risks as measured in geopolitical acts index. Source: Caldara and Iacoviello (2022).

Geopolitical risk: A country-specific measure of adverse geopolitical events and associated risks based on a tally of newspaper articles covering geopolitical tensions, and examine its evolution and economic effects. Source: Caldara and Iacoviello (2022).

Geopolitical threats: The threats of geopolitical risks as measured in geopolitical threats index. Source: Caldara and Iacoviello (2022).

Global geopolitical risk: A news-based measure of overall adverse global geopolitical events and associated risks. Source: Caldara and Iacoviello (2022).

IFRS adoption: Dummy variable equal to 1 for IPOs taking place during or after the year of IFRS adoption in the country of issuance, and 0 otherwise. Source: Hong et al. (2014).

Institutional quality: Country-specific measure of economic institutional quality in the year of the IPO firm listing. Source: Kunčič (2014).

IPO activity: Total number of IPOs in the issue year divided by the number of listed firms for the country of listing. Source: SDC Platinum / World Federation of Exchange.

IPO age: Logarithmic transformation of the sum of 1 and the difference in years since the firm was established up to the year of listing. Source: SDC Platinum / Worldscope.

IPO float: Regular shares issued to the public for trading divided by the total number of outstanding shares. Source: SDC Platinum.

IPO underpricing: IPO's first-day closing price minus the offer price, scaled by the offer price. Source: SDC Platinum / Datastream.

IPO volume: Total number of IPOs calculated as the log-transformed total number of IPOs each year in the country of issuance. Source: SDC Platinum / World Federation of Exchange.

Leniency legislation: Dummy variable equal to 1 if the IPO takes place during or after the year anti-collusion law has been passed in the country of issuance, and 0 otherwise. Source: Dasgupta and Žaldokas (2019) and Cartel Regulation 2021 Guidebook.

Leverage: Total debt divided by total assets of the IPO firm at the time of listing. Source: SDC Platinum / Worldscope.

Market-adjusted IPO underpricing: IPO underpricing minus the return on the listing day domestic benchmark value-weighted index. Source: SDC Platinum / Datastream.

Market return: Return on the country-specific benchmark value-weighted index over the three months preceding the offering. Source: Datastream.

Market size: Country-specific total market capitalization of the stock traded divided by the GDP in the year of the IPO listing. Source: World Bank WDI.

Market-to-book: Market value of assets divided by total assets (book value of assets) of the IPO firm at the time of listing. Source: SDC Platinum / Worldscope.

No. of underwriters: Logarithmic transformation of the sum of 1 and the total number of investment banks underwriting the IPO. Source: SDC Platinum.

Number of proceeds use: Logarithmic transformation of the sum of 1 and the total number of specific purposes behind raising IPO proceeds disclosed in the prospectus. Source: SDC Platinum.

Offer size: Logarithmic transformation of total proceeds raised by the IPO firm (in millions of U.S. dollars) at the time of listing. Source: SDC Platinum.

One-week underpricing: IPO closing price at the end of the day-5 post listing minus offer price, divided by offer price. Source: SDC Platinum / Datastream.

Press freedom: Country-specific index on a scale of 0 to 1 that measures the ability of journalists to report freely on matters of public interest in a country. Source: Freedom House.

Price revision: Difference between the IPO offer price and the mid-point of the initial filing range, divided by the mid-point of the initial filing range. Source: SDC Platinum.

Proceeds use: Dummy variable equal to 1 if the IPO prospectus discloses a specific purpose or rationale behind raising IPO proceeds (e.g., investments, pay-off debt, corporate restructure / expansion, etc.), and 0 if the firm discloses only a "General Corporate Purpose" or "Others". Source: SDC Platinum.

Profitability: EBIT divided by total assets of the IPO firm at the time of listing. Source: SDC Platinum / Worldscope.

Religious tension: Source: Country-specific index for the level of religious tension on a scale of 0 to 1, with higher score indicating lower level of religious tension. We multiply religious tension score by -1 to align its interpretation with geopolitical index. Source: World Bank Indicators.

Rule law: Country-specific rule of law index in the year of the IPO firm listing. Source: Worldwide Governance Indicators Project.

Shareholder rights: Country-specific anti-director self-dealing rights index. Source: Spamann (2010).

Trading Volume: Listing-day total trading volume scaled by the total shares issued by the IPO firm at the time of listing. Source: SDC Platinum.

Underwriter Fee: Total fee charged by the investment bank(s) underwriting the IPO, divided by the total proceeds raised in the IPO. Source: SDC Platinum.

Underwriter reputation: Dummy variable equal to 1 if the investment bank underwriting the IPO is in the top quartile based on combined IPO proceeds, and 0 otherwise. Source: SDC Platinum.

Figure 1. Geopolitical risk and IPO underpricing: Univariate Analysis

This figure presents the annual average IPO underpricing and geopolitical risk. Our sample consists of 23,630 IPOs across 35 countries spanning the period 1990 to 2020. Variable definitions and data sources are reported in the Appendix.

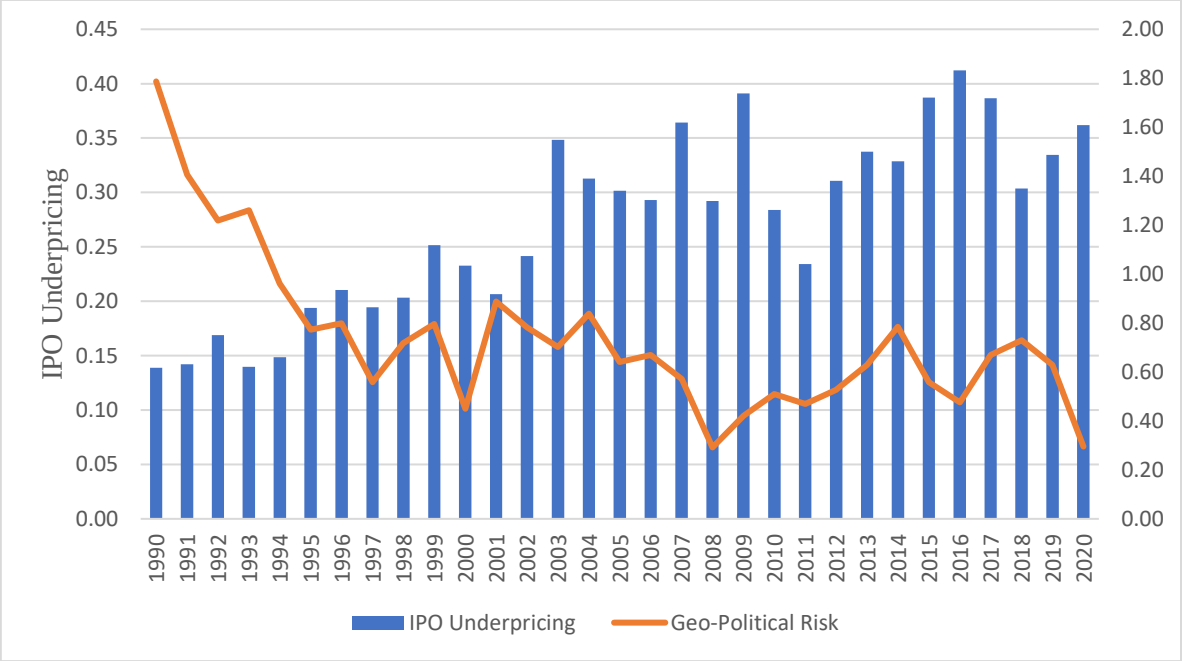

Figure 2. Geopolitical risk and IPO activity: Univariate Analysis

This figure presents the annual total number of IPOs and average geopolitical risk. Our sample consists of 23,630 IPOs across 35 countries spanning the period 1990 to 2020. Variable definitions and data sources are reported in the Appendix.

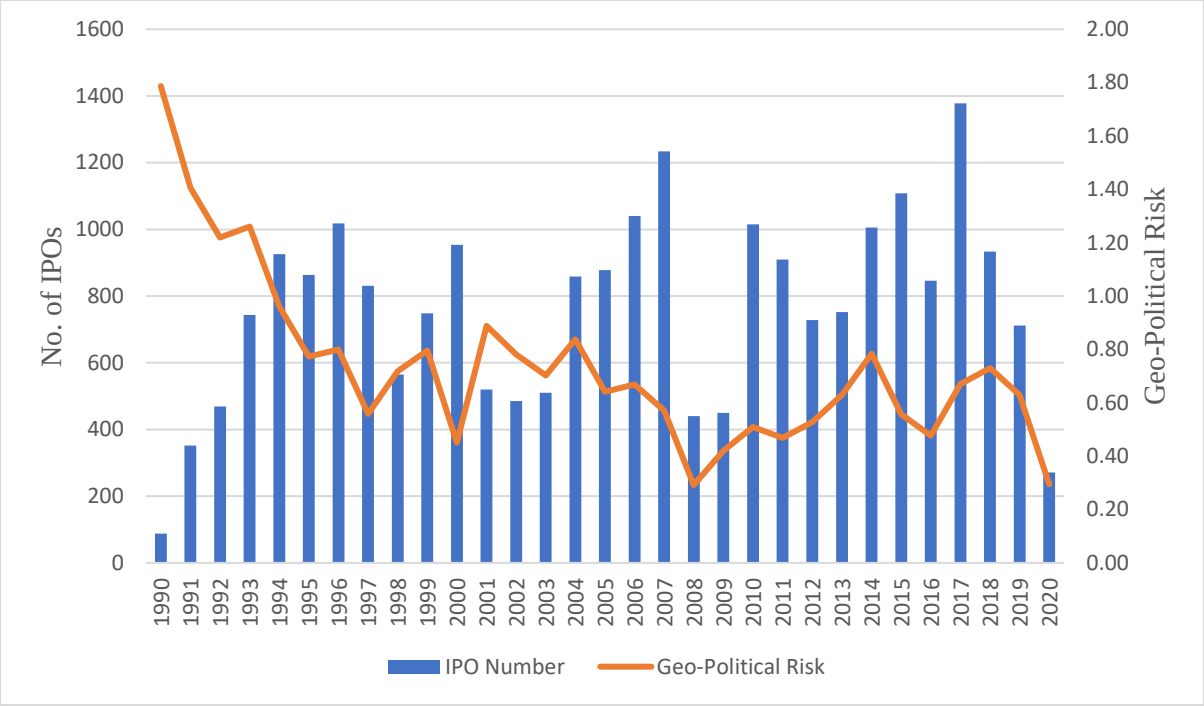

Table 1. Sample distribution

Countries	No. of IPOs	IPO proportion	IPO underpricing	Geopolitical risk
Argentina	22	0.09%	0.4676	0.0214
Australia	1,235	5.23%	0.2356	0.0854
Belgium	67	0.28%	0.1110	0.1172
Brazil	132	0.56%	0.1767	0.0445
Canada	987	4.18%	0.2928	0.1842
Chile	36	0.15%	0.2204	0.0150
China	2,272	9.61%	0.5177	0.4925
Colombia	10	0.04%	0.2780	0.0270
Denmark	54	0.23%	0.2107	0.0300
Finland	59	0.25%	0.1825	0.0280
France	534	2.26%	0.1171	0.4690
Germany	360	1.52%	0.1456	0.3158
Hong Kong	1,615	6.83%	0.2798	0.0594
India	1,519	6.43%	0.2362	0.1721
Indonesia	348	1.47%	0.3482	0.0414
Israel	50	0.21%	0.3700	0.3606
Italy	226	0.96%	0.1568	0.1232
Japan	2,257	9.55%	0.4773	0.2289
Korea South	1,131	4.79%	0.3650	0.3145
Malaysia	687	2.91%	0.2491	0.0356
Mexico	58	0.25%	0.1376	0.0840
Netherlands	56	0.24%	0.1757	0.0664
Norway	127	0.54%	0.1591	0.0455
Philippines	101	0.43%	0.1885	0.0397
Portugal	16	0.07%	0.1932	0.0313
Russian Federation	72	0.30%	0.2331	0.5158
South Africa	55	0.23%	0.2182	0.0536
Spain	79	0.33%	0.1891	0.0865
Sweden	204	0.86%	0.1614	0.0514
Switzerland	83	0.35%	0.1877	0.0443
Taiwan	1,286	5.44%	0.2925	0.0466
Thailand	530	2.24%	0.3419	0.0394
Turkey	137	0.58%	0.2227	0.2284
The U.K.	1,374	5.81%	0.1749	1.0288
The U.S.A.	5,851	24.76%	0.1913	1.9925
Total	23,630	100.00%	0.2832	0.6926

This table presents the sample distribution by country. Our sample consists of 23,630 IPOs across 35 countries from 1990 to 2020. Variable definitions and data sources are reported in the Appendix.

Table 2. Descriptive statistics

Variables	Obs.	Average	Standard deviation	Percentile 25^{th}	Median	Percentile 75^{th}
IPO underpricing	23,630	0.2832	0.4768	0.0350	0.1217	0.3675
Geopolitical risk	23,630	0.6926	0.8996	0.0800	0.2400	1.0900
Firm size	23,630	4.1825	2.0361	2.8070	4.0587	5.3778
Profitability	23,630	0.0249	0.2727	0.0000	0.0586	0.1267
Leverage	23,630	0.2453	0.2638	0.0260	0.1752	0.3778
Market-to-book	23,630	3.7537	5.4313	1.2825	2.2375	3.9800
Asset turnover	23,630	0.7958	0.8189	0.1343	0.6054	1.1587
IPO age	23,630	1.7102	1.3006	0.0000	1.9459	2.7726
Underwriter reputation	23,630	0.4601	0.4984	0.0000	0.0000	1.0000
Bookbuilding	23,630	0.6295	0.4829	0.0000	1.0000	1.0000
Rule of law	23,630	1.0809	0.7617	0.5200	1.5000	1.6100
Market return	23,630	0.0072	0.0569	-0.0211	0.0091	0.0345
GDP pc growth	23,630	0.0294	0.0270	0.0141	0.0242	0.0409
Market size	23,630	1.9058	2.9386	0.6617	0.9766	1.4165
IPO activity	865	0.0595	0.0540	0.0227	0.0453	0.0816
Volume of IPOs	865	3.2153	1.3695	2.1972	3.0952	4.2195

This table presents the summary statistics of the variables used in the baseline regression model. Our sample consists of 23,630 IPOs across 35 countries from 1990 to 2020. Variable definitions and data sources are presented in the Appendix.

Table 3. Geopolitical risk and IPO market and underpricing: Baseline regression analysis

Panel A. Geopolitical risk and IPO underpricing - Dependent Variable: IPO underpricing						
	Model 1		Model 2		Model 3	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Geopolitical risk	-0.0352	-4.09	-0.0318	-3.77	-0.0269	-3.69
Firm size			-0.0319	-8.93	-0.0315	-8.83
Profitability			0.0650	4.12	0.0665	4.20
Leverage			-0.0281	-2.27	-0.0266	-2.15
Market-to-book			0.0035	3.66	0.0034	3.57
Asset turnover			-0.0032	-0.65	-0.0036	-0.72
IPO age			0.0081	3.29	0.0082	3.35
Underwriter reputation			0.0449	2.34	0.0429	2.28
Bookbuilding			-0.0428	-3.61	-0.0470	-3.92
Rule of law					0.5483	6.75
Market return					1.0703	3.43
GDP pc growth					0.0085	1.87
Market size					-0.0269	-3.69
Country, Industry and Year FE	Included		Included		Included	
Observations	23,630		23,630		23,630	
Adjusted R Sq.	0.0884		0.1027		0.1094	

Panel B. Geopolitical risk and IPO volume				
Dependent Variable	IPO activity		Volume of IPOs	
	Model 1		Model 2	
	Coeff	t-stat	Coeff	t-stat
Geopolitical risk	-0.0189	-2.34	-0.2962	-2.05
Rule of law	0.0071	0.58	0.0533	0.29
Market return	0.0217	0.76	-0.5627	-1.06
GDP pc growth	0.4902	8.35	7.9243	7.55
Market size	0.0024	1.88	0.0677	3.79
Institutional quality	-0.0074	-0.21	1.1374	2.15
Country and Year FE	Included		Included	
Observations	865		865	
Adjusted R Sq.	0.3251		0.7230	

This table presents baseline regression results for the relation between geopolitical risk and IPO underpricing (Panel A) and activity, the total number of IPOs in the issue year divided by the number of listed firms for the country of listing, and volume of IPOs, the log of total number of IPOs in the country of issuance (Panel B). Our sample consists of 23,630 IPOs across 35 countries from 1990 to 2020. In Panel B, our baseline sample of 23,630 IPOs across 35 countries from 1990 to 2020 is compressed at the country-year level resulting in a final sample of 865 country-year observations. The regressions are performed by OLS, with *t*-statistics computed using standard errors robust to heteroskedasticity and clustered at the industry-year level (Panel A) and at the issue year level (Panel B). Constant, country of listing; industry based on Kenneth French 12-industry classification (Panel A), and year of listing fixed effects are included in all the regressions. Variable definitions and data sources are presented in the Appendix.

Table 4. 2SLS regressions

	IPO activity		Underpricing		Volume of IPOs		Underpricing	
	Stage 1		Stage 2		Stage 1		Stage 2	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Geo-Political Risk	-0.0220	-2.65			-0.2620	-1.80		
Fitted IPO activity			1.8816	3.18				
Fitted volume of IPOs							0.1584	3.18
Firm size			-0.0313	-8.79			-0.0313	-8.79
Profitability			0.0659	4.17			0.0659	4.17
Leverage			-0.0262	-2.12			-0.0262	-2.12
Market-to-book			0.0034	3.58			0.0034	3.58
Asset turnover			-0.0034	-0.69			-0.0034	-0.69
IPO age			0.0082	3.34			0.0082	3.34
Underwriter reputation			0.0432	2.29			0.0432	2.29
Bookbuilding			-0.0465	-3.86			-0.0465	-3.86
Rule of law			0.0986	2.23			0.0986	2.23
Market return			0.5460	6.70			0.5460	6.70
GDP pc growth			1.0417	3.31			1.0417	3.31
Market size			0.0085	1.86			0.0085	1.86
Country FE	Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes	
Observations	865		23,630		865		23,630	
Adjusted R Sq.	0.2725		0.1093		0.6965		0.1093	

This table presents the 2SLS regression results for the relation between geopolitical risk, IPO market in the country of issuance and underpricing. We use two measures for the IPO market: IPO activity, the total number of IPOs in the issue year divided by the number of listed firms for the country of listing, and IPO volume, the log of total number of IPOs. Our sample consists of 23,630 IPOs across 35 countries from 1990 to 2020. In Stage 1, our baseline sample is compressed at the country-year level resulting in a final sample of 865 country-year observations. We compute the t-statistics using standard errors robust to heteroskedasticity and clustered at the issue year level (Stage 1) at the industry-year level (Stage 2). Constant, country of listing; industry based on Kenneth French 12-industry classification (Stage 2), and year of listing fixed effects are included in all the regressions. Variable definitions and data sources are presented in the Appendix.

Table 5. Geopolitical risk and IPO underpricing: Robustness tests

	Coeff.	t-stat.
Panel A: Alternate proxy for IPO underpricing		
(1) IPO returns one-week after listing		
Dependent variable:	One-week underpricing	
Geopolitical risk	-0.0238	-3.73
Observations	18,793	
Adjusted R Sq.	0.1884	
(2) IPO first day return minus the listing-day market return		
Dependent variable:	Market-adjusted IPO underpricing	
Geopolitical risk	-0.0274	-3.83
Observations	23,630	
Adjusted R Sq.	0.1095	
Panel B: Alternate proxy for geopolitical risk		
(1) Global geopolitical risk		
Dependent variable:	IPO underpricing	
Global geopolitical risk	-0.0218	-2.35
Observations	16,479	
Adjusted R Sq.	0.1094	
(2) Threats of geopolitical risk from geopolitical threats index		
Dependent variable:	IPO underpricing	
Geopolitical threats	-0.0373	-2.88
Observations	23,630	
Adjusted R Sq.	0.1096	
(3) Realization of geopolitical risk from geopolitical acts index		
Dependent variable:	IPO underpricing	
Geopolitical acts	-0.0097	-1.77
Observations	23,630	
Adjusted R Sq.	0.1093	
Panel C: Alternate model specifications - Dependent variable is IPO underpricing		
(1) Standard errors clustered at country-year level		
Geopolitical risk	-0.0276	-2.10
Observations	23,630	
Adjusted R Sq.	0.1098	
(2) Exclude US, a country with maximum volume of IPOs and highest average GPR		
Geopolitical risk	-0.0215	-2.25
Observations	17,779	
Adjusted R Sq.	0.1181	
(3) Exclude 5 countries with maximum volume of IPOs - US, China, Japan, HK and India		
Geopolitical risk	-0.0150	-2.01
Observations	10,116	
Adjusted R Sq.	0.0970	
(4) Exclude IPOs from regulated industries - Utilities and Financial Institutions		

Geopolitical risk	-0.0331		-2.13
Observations		19,567	
Adjusted R Sq.		0.1227	

This table presents the results of robustness tests for the relation between geopolitical risk and IPO underpricing. For brevity, the table only reports the coefficients of the variable of interest, *Geopolitical risk*. The control variables are consistent with our previous results. Our sample consists of up to 23,630 IPOs across 35 countries from 1990 to 2020 depending upon the data availability. The regressions are performed by OLS, with *t*-statistics computed using standard errors robust to heteroskedasticity and clustered at the industry-year level (except in Panel C(1)). We include in all the regressions a constant, country of listing, industry based on Kenneth French 12-industry classification, and year of listing fixed effects. Variable definitions and data sources are in the Appendix.

Table 6. Geopolitical risk and IPO underpricing: Country-; Industry and Year level regressions

Panel A: Country-level regressions

Country	Geopolitical risk Coeff	Geopolitical risk t-stat	Obs.	Adj. R Sq.
Australia	-0.1680	-1.74	1,235	0.0926
Brazil	-0.4890	-2.88	132	0.0986
Canada	-0.2119	-2.22	987	0.1002
China	-0.0907	-2.10	2,272	0.1378
France	-0.0871	-2.70	534	0.1272
Germany	-0.0054	-0.04	360	0.0765
Hong Kong	-0.1474	-2.70	1,615	0.1290
India	-0.0768	-1.82	1,519	0.1164
Indonesia	-0.1275	-1.65	348	0.0988
Italy	-0.0807	-0.45	226	0.0597
Japan	-0.0980	-2.60	2,257	0.2149
Korea South	-0.1395	-2.11	1,131	0.0881
Malaysia	-0.1123	-1.88	687	0.0390
Mexico	-0.2808	-0.32	127	0.1601
Philippines	-0.6376	-1.47	101	0.1610
Sweden	0.0846	0.07	204	0.0688
Taiwan	-0.3498	-1.90	1,286	0.1962
Thailand	-0.1709	-2.61	530	0.1267
Turkey	-0.7815	-1.85	137	0.1621
U.K.	-0.0493	-2.91	1,374	0.0954
U.S.A.	-0.0294	-5.59	5,851	0.1092

Panel B: Industry-level regressions

Industry	Geopolitical risk Coeff	Geopolitical risk t-stat	Obs.	Adj. R Sq.
Consumer Non-Durable	-0.0161	-1.95	1,539	0.0818
Consumer Durables	0.0026	-2.11	682	0.1232
Manufacturing	0.0140	-1.81	2,540	0.1134
Energy	-0.0364	-1.73	657	0.1072
Chemicals	-0.0124	-2.47	707	0.1756
Business Equipment	-0.0786	-7.33	4,551	0.1265
Telecom	0.0062	0.39	477	0.1295
Utilities	-0.0255	-0.61	317	0.0670
Wholesale	-0.0505	-4.58	2,034	0.1037
Healthcare	-0.0339	-3.29	2,119	0.1129
Money / Finance	-0.0185	-2.62	3,746	0.0795
Other	-0.0197	-2.08	4,261	0.1016

Panel C: Year-level regressions (in five-year window)

Issue Year Window	Geopolitical risk Coeff	Geopolitical risk t-stat	Obs.	Adj. R Sq.
1990 to 1995	-0.0384	-3.45	3,441	0.1497
1996 to 2000	-0.0766	-4.16	4,116	0.0496
2001 to 2005	-0.1495	-3.76	4,179	0.2171
2006 to 2010	0.0014	0.22	3,252	0.1676
2011 to 2015	-0.0813	-2.44	4,502	0.1710
2016 to 2020	-0.0401	-2.26	4,140	0.2235

This table presents country-, industry- and year-level regression results for the relation between geopolitical risk and IPO underpricing. Our sample consists of 23,630 IPOs across 35 countries from 1990 to 2020. In Panel A, we only include countries for which we have at least 100 IPOs over the sample period. The regressions are performed by OLS, with *t*-statistics computed using standard errors robust to heteroskedasticity and clustered at the industry-year level. Constant, country of listing; industry based on Kenneth Fama 12-industry classification; and year of listing fixed effects are included in all the regressions but are not reported. Variable definitions and data sources are presented in the Appendix.

Table 7. Geopolitical risk and IPO underpricing: Instrumental variable estimation

	Geo-Political Risk		Underpricing		Impact Threshold for a Confounding Variable (ITCV)	
	Stage 1		Stage 2			
	Coeff.	t-stat	Coeff.	t-stat	Partial	Raw
Religious Tensions	0.1426	9.78			-0.0125	
Fitted Geo-Political Risk			-0.1937	-3.65		
Firm size	-0.0002	-0.07	-0.0390	-14.24	-0.0249	-0.0283
Profitability	0.0121	1.29	0.0806	4.86	-0.0012	-0.0038
Leverage	0.0024	0.19	-0.0429	-3.01	0.0001	-0.0015
Market-to-book	-0.0002	-0.41	0.0039	4.28	0.0020	0.0032
Asset turnover	0.0047	1.29	-0.0031	-0.52	0.0001	-0.0074
IPO age	0.0004	0.15	0.0086	2.81	-0.0072	-0.0083
Underwriter reputation	0.0126	1.50	0.0498	4.58	-0.0009	0.0042
Bookbuilding	0.0602	8.65	-0.0722	-5.77	0.0061	-0.0009
Rule of law	-0.1283	-4.82	0.0319	0.77	-0.0148	-0.0350
Market return	-0.0015	-0.03	0.7981	10.10	0.0015	0.0007
GDP pc growth	-0.5751	-3.71	1.4302	5.42	0.0002	-0.0102
Market size	0.0102	4.44	0.0248	7.66	-0.0109	-0.0041
Country FE	Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Observations	18340		18340		23630	
Adjusted R Sq.	0.7931		0.1210		-	
Excluded Instrument Test						
F-Stat	95.67					
Prob	0.000					
Underidentification Kleibergen-Paap LM						
Chi-sq	108.82					
P-Value	0.000					

This table presents the results for the instrumental variable estimation for the relation between geopolitical risk and IPO underpricing. The dependent variable in Stage 1 is Geopolitical risk and Underpricing in stage 2. The sample consists of 23,630 IPOs across 35 countries from 1990 to 2020. Religious Tension is from ICRG Database, Period 1998 to 2020. The regressions are performed by 2-SLS, with t-statistics computed using standard errors robust to heteroskedasticity. Constant, country of listing; industry based on Kenneth Fama 12-industry classification; and year of listing fixed effects are included in all the regressions but are not reported. Variable definitions and data sources are presented in the Appendix.

Table 8. Geopolitical risk and IPO underpricing: The moderating effect of information asymmetries of the issuing firm

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Panel A. The moderating effect of third-party certification of the issuing firm										
Geo-Political Risk	-0.0506	-4.81	-0.0634	-5.41	-0.0389	-3.94				
Underwriter reputation	0.0142	0.57								
Geo-Political Risk * Underwriter reputation	0.0379	3.59								
No. of underwriters			-0.1337	-7.68						
Geo-Political Risk * No. of underwriters			0.0443	4.53						
Big 4 auditor					-0.0260	-1.73				
Geo-Political Risk * Big 4 auditor					0.0161	1.85				
Country FE	Yes		Yes		Yes					
Industry FE	Yes		Yes		Yes					
Year FE	Yes		Yes		Yes					
Observations	23,630		23,630		23,630					
Adjusted R Sq.	0.1105		0.1125		0.1097					
Clustering	Ind_Yr		Ind_Yr		Ind_Yr					
Panel B. Other firm specific information asymmetries effects										
Geo-Political Risk	-0.1185	-8.01	-0.0353	-4.18	-0.0308	-3.96	-0.0503	-5.42	-0.0327	-3.61
Firm size	-0.0452	-10.94								
Geo-Political Risk * Firm size	0.0165	8.31								
IPO age			0.0039	1.29						
Geo-Political Risk * IPO age			0.0062	2.69						
Carve-out					-0.0436	-4.13				
Geo-Political Risk * Carve-out					0.0222	2.87				
Diversification							0.0056	0.5		
Geo-Political Risk * Diversification							0.0530	6.4		
Proceeds use									-0.0101	-0.97
Geo-Political Risk * Proceeds use									0.0121	1.76

Country FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	23,630	23,630	23,630	23,630	23,630
Adjusted R Sq.	0.1131	0.1096	0.1101	0.1133	0.1095
Clustering	Ind_Yr	Ind_Yr	Ind_Yr	Ind_Yr	Ind_Yr
Clustering	Ind_Yr	Ind_Yr	Ind_Yr	Ind_Yr	Ind_Yr

This table presents the regression results for the effect of the issuing firm's specific information asymmetries effects as measured by the third-party underwriter and auditor certifications and other proxy variables, including firm size, age, carve-out, diversification and use of proceeds. Each regression includes all the control variables in Table 3 Panel A. Our sample consists of 23,630 IPOs across 35 countries from 1990 to 2020. The regressions are performed by OLS, with *t*-statistics computed using standard errors robust to heteroskedasticity and clustered at the industry-year level. Constant, country of listing; industry based on Kenneth French 12-industry classification; and year of listing fixed effects are included in all the regressions. Variable definitions and data sources are presented in the Appendix.

Table 9. Geopolitical risk and IPO underpricing: The moderating effect of the strength of country-level external governance mechanisms

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Panel A. Effects of regulatory Reforms introduced at country-level										
Geo-Political Risk	-0.0194	-2.65	-0.0362	-4.00	-0.0477	-4.37				
Boardroom reform	-0.0905	-3.82								
Geo-Political Risk * Boardroom reform	0.0215	3.00								
IFRS adoption			-0.2075	-8.18						
Geo-Political Risk * IFRS adoption			0.0928	2.09						
Leniency legislation					-0.0369	-2.07				
Geo-Political Risk * Leniency legislation					0.0217	2.03				
Country FE	Yes		Yes		Yes					
Industry FE	Yes		Yes		Yes					
Year FE	Yes		Yes		Yes					
Observations	21,869		21,424		23,282					
Adjusted R Sq.	0.1166		0.1246		0.1102					
Clustering	Ind_Yr		Ind_Yr		Ind_Yr					
Panel B. External Governance and Level of Institutional Quality at country-level										
Geo-Political Risk	-0.0832	-3.07	-0.1124	-2.15	-0.0837	-5.85	-0.1163	-2.04	-0.2247	-2.41
Shareholder rights	-0.0226	-4.19								
Geo-Political Risk * Shareholder rights	0.0175	1.98								
Accounting conservatism			-0.3642	-4.83						
Geo-Political Risk * Accounting conservatism			0.2985	1.80						
Democracy					-0.1318	-7.36				
Geo-Political Risk * Democracy					0.0591	4.04				
Institutional quality							-0.3077	-2.73		
Geo-Political Risk * Institutional quality							0.1107	1.79		
Press freedom									-0.3768	-4.05
Geo-Political Risk * Press freedom									0.2266	2.03

Country FE	No	No	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	23,630	21,276	22,015	23,630	20,336
Adjusted R Sq.	0.0704	0.0533	0.1196	0.1098	0.1097
Clustering	Ind_Yr	Ind_Yr	Ind_Yr	Ind_Yr	Ind_Yr

This table presents the regression results for the effect of the strength of country-level external governance mechanisms on the relation between geopolitical risk and IPO underpricing. Each regression includes all the control variables in Table 3 Panel A. Our sample consists of 23,630 IPOs across 35 countries from 1990 to 2020. The regressions are performed by OLS, with *t*-statistics computed using standard errors robust to heteroskedasticity and clustered at the industry-year level. Constant, country of listing (except in Models 1 and 2 where external governance factors are time-invariant); industry based on Kenneth French 12-industry classification; and year of listing fixed effects are included in all the regressions. Variable definitions and data sources are presented in the Appendix.

Table 10 Geopolitical risk and other IPO outcomes

Dependent Variable	Offer size		IPO float		Price revision		Number of proceeds use		Underwriter fee	
	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Geo-Political Risk	-0.0402	-1.81	-0.0128	-2.21	-0.0027	-1.87	0.0215	2.50	0.0010	1.91
Firm size	0.3921	45.93	-0.0120	-6.68	0.0017	4.16	0.0049	4.67	-0.0023	-19.34
Profitability	-0.1029	-3.08	-0.0239	-3.04	0.0009	0.43	0.0010	0.20	-0.0012	-1.86
Leverage	-0.1001	-3.92	0.0021	0.27	-0.0126	-5.13	-0.0221	-3.88	0.0005	0.83
Market-to-book	0.0135	8.60	-0.0036	-9.54	0.0005	4.03	-0.0016	-7.30	0.0000	0.48
Asset turnover	0.0597	5.93	-0.0173	-6.65	-0.0036	-3.50	0.0029	1.92	-0.0012	-5.06
IPO age	-0.0239	-4.64	-0.0067	-3.22	-0.0005	-0.91	-0.0030	-2.75	0.0000	-0.05
Underwriter reputation	1.2107	39.81	0.0201	3.89	0.0119	6.26	-0.0503	-9.29	-0.0072	-15.09
Bookbuilding	0.2843	15.56	0.0104	1.84	-0.0100	-2.13	0.0042	1.61	-0.0140	-25.26
Rule of law	-0.4318	-7.73	0.0559	3.25	-0.0116	-2.34	0.0532	5.79	-0.0100	-5.32
Market return	0.1863	2.05	0.0419	1.34	-0.0044	-0.59	-0.0064	-0.35	-0.0007	-0.29
GDP pc growth	2.5806	5.86	0.0592	0.43	-0.0456	-1.78	-0.2671	-3.42	0.0283	2.01
Market size	0.0315	4.79	-0.0136	-7.44	0.0008	1.80	-0.0014	-1.72	-0.0011	-5.88
Geo-Political Risk	-0.0402	-1.81	-0.0128	-2.21	-0.0027	-1.87	0.0215	2.50	0.0010	1.91
Country, Industry and Year FE	Included		Included		Included		Included		Included	
Observations	23,630		20,888		11,991		23,616		21,512	
Adjusted R Sq.	0.7557		0.1514		0.0483		0.2348		0.5076	

This table presents the regression results for the relation between geopolitical risk and other IPO outcomes. Our sample consists of up to 23,630 IPOs across 35 countries from 1990 to 2020 depending upon the data availability. The regressions are performed by OLS, with *t*-statistics computed using standard errors robust to heteroskedasticity and clustered at the industry-year level. Constant, country of listing; industry based on Kenneth French 12-industry classification; and year of listing fixed effects are included in all the regressions. Variable definitions and data sources are presented in the Appendix.