

INTERNATIONAL MONETARY FUND

The Economic Consequences of Social Unrest

Evidence from Initial Public Offerings

Philip Barrett, Thomas J. Boulton, Terry D. Nixon

WP/23/232

IMF Working Papers describe research in progress by the author(s) and are published to elicit comments and to encourage debate.

The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

**2023
NOV**



WORKING PAPER

IMF Working Paper

Western Hemisphere Department

The Economic Consequences of Social Unrest: Evidence from Initial Public Offerings

Prepared by Philip Barrett, Thomas J. Boulton, Terry D. Nixon *

Authorized for distribution by Nigel Chalk

November 2023

IMF Working Papers describe research in progress by the author(s) and are published to elicit comments and to encourage debate. The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

ABSTRACT: Prior research attributes negative stock market performance following episodes of social unrest to elevated uncertainty. However, social unrest does not solely increase uncertainty, but separately acts to decrease investor sentiment. To determine which effect dominates, we study initial public offering (IPO) underpricing, which responds differently to changes to uncertainty and investor sentiment. Consistent with the notion that social unrest dampens investor sentiment, we find robust evidence that IPO first-day returns are lower during times of greater social unrest. Limits to arbitrage intensify the negative relation between social unrest and underpricing. Notably, strong institutional frameworks mitigate the impact of social unrest on underpricing, suggesting that quality institutions weaken the link between investor sentiment and returns.

JEL Classification Numbers: G12, G15, G24, G38

Keywords: Initial public offerings; investor sentiment; social unrest; underpricing

Author's E-Mail Address: pbarrett@imf.org, boultojt@miamioh.edu, nixontd@miamioh.edu

* Research funding was provided by the Jack R. Anderson Professorship (Boulton).

1. Introduction

Following a decline during the COVID pandemic, economic, political, and social grievances have led to an increase in incidents of social unrest in recent years.¹ Figure 1 illustrates this point, plotting the frequency of major social unrest events identified by Barrett et al.'s (2022a) monthly Reported Social Unrest Index (RSUI).² Pre-COVID, unrest surged, peaking with the broad wave of protest in Latin America in late 2019. And although a combination of lockdowns and distaste for public gatherings led to a sharp decline in unrest during the pandemic, unrest has returned to levels similar to those seen in 2017 and 2018.

While the goal of social unrest is often to highlight and correct perceived social injustices, the economic consequences can be severe. For instance, Hadzi-Vaskov et al. (2023) find that social unrest is associated with a sharp increase in a country's World Uncertainty Index, as well as a decline in consumer and business confidence. This leads to a decline in investment and consumption, which has adverse macroeconomic consequences including a 0.2 percentage point decrease in GDP for six quarters compared to the pre-unrest level.³ Dong et al. (2018) use credit card transaction data to provide novel evidence consistent with a consumption effect. Specifically, they find that foot traffic and spending markedly decrease for stores located near incidents of social unrest.

Research also links social unrest to stock market performance. Barrett et al. (2022b) find that cumulative abnormal returns decrease by 1.4 percentage points on average following social unrest,

¹ <https://www.imf.org/en/Blogs/Articles/2022/05/20/social-unrest-is-rising-adding-to-risks-for-global-economy> (Accessed: May 31, 2023).

² As discussed below, the RSUI measures the frequency of articles matching certain keywords related to unrest in a range of media sources. Due to differences in coverage, the level of the index is hard to compare across locations. However, sharp spikes in the index are very strongly associated with actual episodes of social unrest. Barrett et al. (2022a) formalize this notion, defining such spikes consistently across locations to create a list of plausible social unrest events.

³ Kollias and Tzeremes (2022) argue that the relation between unrest and economic performance is bidirectional (i.e., unrest adversely affects economic performance and economic hardship promotes unrest).

with greater impact for longer periods of unrest and for unrest in emerging markets. Tanyeri et al. (2022) examine how unrest affected the major stock indices of countries touched by the Arab Spring. The authors find average abnormal returns of -1% on key dates, with Egypt experiencing the largest negative abnormal returns (-6%). Klomp (2021) examines the effect of unrest on the defense industry during the Arab Spring and finds that defense-related firms saw short-term abnormal equity returns of 5%. In the long-term, this same industry exhibits a 3% decline in abnormal equity returns. The author attributes this to initial hoarding of military equipment followed by a period of fear over international sanctions. Espinosa-Méndez (2022) examines investor reaction to the violent riots that occurred in 2019 in Chile and finds evidence of reverse herding behavior. Namely, in periods of financial crisis investors often exhibit herd behavior, but during times of social unrest, they tend to make their own decisions.

Despite substantial evidence that social unrest affects macroeconomic and stock market outcomes, we know less about its impact on individual firms. This is where our main contribution lies. The above studies suggest that firms should find it more difficult and costly to acquire capital during periods of unrest, but empirical evidence is lacking. We address this issue by studying the relation between social unrest and initial public offerings (IPOs). IPOs offer an interesting laboratory for exploring the relation between unrest and firm-level outcomes because they allow us to disentangle two key channels through which social unrest might affect firms' capital raising efforts. Specifically, lower investor sentiment and increased uncertainty affect IPOs differently. For instance, Ljungqvist et al. (2006) suggest that IPOs are underpriced, in part, to compensate investors for the possibility that sentiment decreases before they can unload their shares in the aftermarket. Because stronger sentiment increases aftermarket prices, sentiment and underpricing are positively correlated (Derrien, 2005; Cornelli et al., 2006). Additionally, Baker and Wurgler (2007) note "... stocks of low capitalization, younger, unprofitable, high-volatility, non-dividend

paying, growth companies ... are likely to be disproportionately sensitive to broad waves of investor sentiment.” (p. 130) This suggests that the investor sentiment effects are likely to be severe for IPOs. Researchers have confirmed the positive relation between investor sentiment and underpricing using a variety of proxies for sentiment.⁴ If social unrest lowers investor sentiment, IPOs issued during periods of social unrest should exhibit smaller first-day returns.

Theory predicts that increased uncertainty has the opposite effect on underpricing. When there are information disparities among investors, the more informed can avoid overvalued IPOs, leaving more shares for the less informed. Greater uncertainty makes information more valuable and creates an incentive to invest in information production (Beatty and Ritter, 1986). This widens the information gap among investors, as some have the ability and means to gather information, while others do not. This exacerbates the “winner’s curse” – uninformed investors receive larger allocations in less desirable offerings and smaller allocations in more desirable offerings – which results in negative average returns for uninformed investors unless IPOs are deliberately underpriced (Rock, 1986). Prior research uses a range of indicators, including firm and offering characteristics, IPO disclosures, and aftermarket measures, to proxy for ex ante uncertainty.⁵ If social unrest increases uncertainty, IPOs issued during periods of unrest should exhibit larger first-day returns.

Of course, social unrest could simultaneously decrease investor sentiment and increase uncertainty (Hadzi-Vaskov et al., 2023). Therefore, we aim to determine which effect dominates. In order to do so, we construct a large sample of IPOs issued in 36 markets between 1998 and 2018. Using Barrett et al.’s (2022a) RSUI to measure social unrest in the month and location of

⁴ Examples include Bajo and Raimondo (2017) - media sentiment, Boulton et al. (2020) - consumer confidence, Chen et al. (2020) - terrorist attacks, and Mazumder and Saha (2021) - Covid-19 pandemic fear.

⁵ Examples include Ritter (1984) - firm age, Booth and Smith (1986) - underwriter quality, Beatty and Welch (1996) - IPO risk factors disclosure, and Ritter (1984) - aftermarket volatility.

IPO issuance, we report robust evidence that greater social unrest is associated with lower first-day returns. This suggests that the impact of social unrest on investor sentiment outweighs the effect it has on uncertainty. When we control for attitudes toward uncertainty, we find evidence that unrest exacerbates IPO outcomes in a manner consistent with our interpretation. Specifically, stronger aversion to uncertainty and ambiguity dampens the negative relation between social unrest and underpricing.

We confirm the negative relation between social unrest and underpricing in a 2SLS setting that addresses model misspecification concerns. Prior research on the determinants of social unrest motivate our instruments in this analysis. First, Barrett et al. (2022a) find that unrest increases the potential for unrest in neighboring countries over the following six months by one percentage point. Therefore, we use neighbors' incidents of social unrest in the preceding six months to instrument for social unrest in the market in which the IPO is issued.⁶ Redl and Hlatshwayo's (2021) finding that prior economic conditions foment unrest motivate our second instrument. Namely, we include the misery index (unemployment rate plus inflation rate) for the IPO firm's economy. Consistent with Barrett et al. (2022a), we find that unrest tends to spread across borders. Tougher economic conditions also exhibit a positive association with social unrest. More importantly, our 2SLS results confirm the negative relation between social unrest and underpricing.

Our international setting provides several advantages over a single country study. For one, we can explore the impact of institutional quality on the relation between social unrest and underpricing. Consistent with prior studies that find that institutional quality affects the relation

⁶ We follow Baker et al. (2021) and use land borders to identify neighbors (source: CIA Factbook). For the islands in our sample, we follow Baker et al. (2021) and match as follows: Australia-New Zealand, Japan-South Korea, Philippines-Malaysia, New Zealand-Australia, and Singapore-Malaysia.

between social unrest and GDP (Hadzi-Vaskov et al., 2023) and social unrest and stock prices (Barrett et al., 2022b), we find that the effect of social unrest on underpricing is also sensitive to institutional quality. Specifically, we find that the negative association between unrest and underpricing is weaker in places that score better along the following dimensions: control of corruption, government effectiveness, political stability, regulatory quality, rule of law, and voice and accountability. Like Schmeling (2009), who studies investor sentiment and aggregate stock market returns, we interpret this as evidence that high-quality institutions weaken the association between investor sentiment and IPO returns.

To test further our claim that sentiment is the key mechanism linking unrest to IPO returns, we study in detail a case where the effect should be magnified: when there are constraints to short-selling. Baker and Wurgler (2006) predict that short sale constraints should exacerbate the impact of a wave of investor sentiment on security prices by limiting arbitrageurs' ability to offset the effects of irrational investors. Consistent with their prediction, they find that short selling constraints magnify the effect of investor sentiment on security mispricing. Boulton et al. (2020) find similar results for IPOs. Specifically, they find that short sale constraints strengthen the positive association between investor sentiment and underpricing. When we exploit differences in short sale constraints across markets, which affect 18-34% of sample IPOs depending on the measure, we find that the negative relation between social unrest and underpricing is aggravated by short selling bans, security lending bans, and when short selling is not typically practiced.

Our results improve our understanding of the economic consequences of social unrest by highlighting the competing effects – investor sentiment and uncertainty – of social unrest on financial markets. Our evidence indicates that, when it comes to IPO underpricing, social unrest's negative impact on investor sentiment tends to dominate any increase in uncertainty it might cause. By studying IPOs, we provide novel evidence that, in addition to the macroeconomic and stock

market effects documented in prior studies, social unrest also has consequences for young firms seeking to raise capital. This is significant because many firms issue IPOs to raise capital to grow and improve the competitiveness of their operations (Leone et al. 2007; Borisov et al. 2021).

Our study also relates to the burgeoning literature that links ESG characteristics to financial market outcomes. Social unrest can have negative consequences for a country's ESG rating,⁷ which Kinnear and Blanco (2022) suggest can "...make them ESG investment pariahs, impeding the inflows needed to improve economic performance and address societal needs." At the same time, social unrest offers an opportunity for firms to signal their commitment to ESG.⁸ Perhaps the most closely related study to ours is Baker et al. (2021), which finds that underpricing is lower for IPOs issued in markets with higher ESG Government Ratings. Fang et al. (2018) find similar results for firm-level ESG, albeit for seasoned equity offerings.⁹ We add to this literature by directly linking social unrest to IPO underpricing through its effect on investor sentiment.

We also contribute to a growing literature that argues that institutional quality has a substantial impact on firm-level capital market outcomes. Early studies in this area find that IPO underpricing is associated with indicators of accounting disclosure (Boulton et al., 2011 & 2017) and investor protection (Boulton et al., 2010; Engelen and van Essen, 2010). A few of the recent papers in this area link underpricing to cultural characteristics (Chourou et al., 2018), short selling regulations (Boulton et al., 2020), and democracy (Duong et al., 2022). Consistent with this literature, we find that market-level indicators of social unrest are associated with firm-level IPO underpricing. Additionally, we consider many of the attributes considered in these earlier studies and find that

⁷ <https://www.maplecroft.com/insights/analysis/social-and-economic-pressures-undermine-governance-latest-sovereign-esg-ratings/> (Accessed: May 31, 2023).

⁸ <https://www.reuters.com/article/bc-finreg-social-unrest-esg-enhance-cred/u-s-social-unrest-presents-opportunities-for-firms-to-enhance-esg-credentials-bolster-ties-with-other-stakeholders-idUSKBN23C2T8> (Accessed: May 31, 2023).

⁹ At the firm-level, Chen and Yang (2020) find that there is the potential for overreaction in stock prices to ESG news that is reversed over the long term.

the association between social unrest and underpricing is sensitive to institutional quality, cultural characteristics, and short selling regulations.

This paper is organized as follows. Section 2 describes our international IPO sample and the empirical strategy we use to test the relation between social unrest and underpricing. Section 3 models the impact of social unrest on underpricing. Section 4 reports the results of our empirical analyses. We summarize and conclude in Section 5.

2. Data description

2.1. Sample construction

We gather data for ordinary common stock offerings issued by non-financial firms between 1998 and 2018 from the Refinitiv SDC Platinum database. We use the SEDOL identifier to match IPOs to Datastream, which is our source of secondary market prices. For IPOs that cannot be matching using the SEDOL, we attempt to match using the company name, listing location, and Datastream entry date. We discard unmatched IPOs and IPOs that do not have a first valid price in Datastream within the window $[-3, +60]$ relative to the IPO issue date. For the remaining IPOs, we calculate underpricing as follows:¹⁰

$$\text{Underpricing} = (\text{First-day closing price} - \text{IPO offer price}) / \text{IPO offer price} \quad (1)$$

To eliminate extreme observations due to erroneous matches between SDC and Datastream, we trim the top and bottom one percent of IPOs based on underpricing. Dropping IPOs without the data required to construct key covariates leaves us with a sample of 15,145 IPOs issued in 36 markets. Nine have four or more unrest events. Among them, Thailand (7) and Türkiye (6)

¹⁰ Due to daily volatility limits, we follow Boulton et al. (2011) and use the tenth valid secondary market closing price to calculate underpricing for IPOs issued in France, Greece, and Thailand. In Table 10, we show that our results are robust to alternative initial return measures.

experience the largest number of unrest incidents between 1998 and 2018. While the majority of markets experience at least one unrest event during our sample period, nine do not (Australia, Canada, Ireland, Japan, New Zealand, Norway, Singapore, South Korea, and the U.S). Our sample includes key developed and developing markets.

We use Barrett et al.'s (2022a) Reported Social Unrest Index (RSUI) to test the relation between social unrest and underpricing. As the authors note, the RSUI is perhaps the broadest and timeliest measure of social unrest available, providing monthly data for 130 economies from 1985 through 2022. The index is constructed by identifying articles in English-language newspapers that contain keywords indicative of social unrest, including variations of “protest,” “riot,” “revolution,” and “unrest.” The authors use these searches to construct the RSUI, which is effectively the fraction of all articles considered that indicate social unrest in a particular economy.¹¹ We rebase the RSUI so that it averages 100 for all sample markets across our 1998-2018 sample period to ensure that meaningful variation in the index drives our results. As a relatively new measure, few empirical studies have used the RSUI;¹² however, Barrett et al. (2022a) use case studies of social unrest occurrences and other common measures of social unrest to validate the RSUI and find that it accurately and consistently captures incidents of social unrest. The authors also show that alternative measures have more limited coverage (Armed Conflict Location Event Dataset), lower frequency (Cross National Time Series Dataset), or a sensitivity of measurement that appears to vary over time.

Table 1 reports the number of IPOs, average RSUI value, and average first-day return by IPO market. IPO activity varies from 1 IPO in Argentina to 2,652 offerings in the U.S. Nineteen markets had more than 100 IPOs during our sample period. RSUI is the average monthly value

¹¹ Barrett et al. (2022a) includes a detailed discussion of the construction of the RSUI.

¹² Notable exceptions include Barrett et al. (2022b), Hadzi-Vaskov et al. (2023), and Redl and Hlatshwayo (2021).

across all IPOs issued in a market. This value ranges from 14.90 in Greece to 252.79 for Türkiye. The third column denotes the number of unrest events during our sample period. Unrest events are common, as three-fourths of markets experience at least one unrest event between 1998 and 2018. The last column reports that the average first-day return is positive everywhere except Israel, where it is close to zero. On the other end of the spectrum are Mainland China and Japan, which have average first-day returns of 62.00% and 72.21%, respectively. Overall, our sample compares favorably with those used in recent international IPO underpricing studies (e.g., Boulton et al., 2020). In robustness tests, we confirm that the results are robust to excluding markets with large numbers of IPOs, high RSUI values, and those that did not experience unrest events.

In Figure 2, we plot two measures of the average *underpricing* value for our sample markets, grouping markets by the frequency of social unrest events.¹³ Although there is some variation across categories and measures, there is a clear association between greater unrest and lower underpricing. This is consistent with the notion that social unrest's influence on investor sentiment dominates any increase in uncertainty that would, in isolation, result in greater underpricing. However, this evidence is only suggestive, as it fails to control for other determinants of underpricing. We address this in the following sections, where we detail our empirical strategy and report the results of our multivariate analysis.

2.2. Empirical strategy

Barrett et al. (2022a) note that coverage issues may make it difficult to compare the *RSUI* for different locations. Therefore, we begin our examination of the relation between social unrest and underpricing by utilizing the following baseline specification with location fixed effects:

¹³ Because cross-market differences in the typical number of reports of social unrest could be due to features of media coverage (such as bias, cultural connections, size or importance, etc.) the average level of the *RSUI* is not comparable across markets. Indeed, to abstract from such difference, we normalize the index to average to 100 in each market.

$$\text{Underpricing}_{ijt} = \beta_0 + \beta_1 \log(1 + \text{RSUI}_{jt}) + \beta \mathbf{X}_{ijt} + \mu_i + \gamma_j + \alpha_t + \varepsilon_{ijt}, \quad (2)$$

where $\text{Underpricing}_{ijt}$ is the first-day return for the IPO of firm i issued in location j in month t ; RSUI_{jt} is Reported Social Unrest Index for location j in month t ; \mathbf{X}_{ijt} is a vector of covariates measured for IPO i issued in location j in month t ; μ_i , γ_j , and α_t are industry, location, and issue year effects, respectively; and ε_{ijt} is the model's residual term. Barrett et al. (2022a) show that $\log(\text{RSUI})$ "is proportional to its percentile rank in both within- and between-country distributions." (p. 23) Therefore, we use the log transformation of RSUI in our regression models.

Table 2 reports descriptive statistics for the variables used in our baseline model. We report the number of observations and average value for each variable separately for IPOs issued within three months of an incident of social unrest (columns 1 and 2) and all other IPOs (columns 3 and 4). In the last two columns, we report the difference between the two subsamples and the p -value from a t -test of the difference.¹⁴ We report definitions and primary data sources for all variables in the Appendix.

Consistent with the notion that social unrest affects investor sentiment, *underpricing* is approximately eight percentage points lower for IPOs issued after a social unrest event (23.3% versus 31.4%). Not surprisingly, the average RSUI value is over seven times higher for IPOs issued in the three months following an unrest event. Not reported in the table is that RSUI values range from zero to 4,055.35 (Netherlands, March 2017). The latter value corresponds to a Dutch-Turkish diplomatic incident that saw pro-Turkish demonstrations in several cities, including Amsterdam and Rotterdam.¹⁵

¹⁴ The results are similar if we consider IPOs issued within six months of an incident of social unrest.

¹⁵ <https://www.dutchnews.nl/news/2017/03/six-arrested-in-amsterdam-as-police-break-up-pro-turkey-demonstration/> (Accessed: May 31, 2023).

Previous research on the determinants of IPO underpricing motivates the other variables summarized in Table 2, which are included as covariates in the multivariate analysis.¹⁶ A burgeoning literature finds that characteristics of the economy in which the IPO is issued are associated with underpricing. For example, recent studies find that underpricing is associated with democracy (Duong et al., 2021), financial market integration (Marcato et al., 2018), economic freedom (Boulton et al., 2010), market competition / concentration (Boulton, 2022), and disclosure quality (Boulton et al., 2011 & 2017). To control for these findings, we include the V-Dem Institute's egalitarian *democracy* score,¹⁷ the KOF Swiss Economic Institute's *financial integration* measure,¹⁸ the Fraser Institute's *economic freedom* index,¹⁹ the World Bank's *market concentration* index,²⁰ and Bhattacharya et al.'s (2003) accrual-based *earnings management* measure.

Ritter (1984) reports that underpricing is greater during hot IPO markets. We include two controls designed to capture the IPO market climate. The first, *IPO activity*, is calculated every location-year as the ratio of number of IPOs to the total number of listed equities. The second, *market return*, is the return on the listing location's Datastream index over the three months preceding the IPO. The difference in *IPO activity* for the subsamples suggests that fewer IPOs take place during bouts of social unrest. *Liquidity* controls for the negative relation between aftermarket liquidity and underpricing documented by Ellul and Pagano (2006).

Investors tend to have more information about larger firms, which reduces information asymmetry and underpricing (Ritter, 1984). We proxy for firm size using the inflation-adjusted

¹⁶ We winsorize all firm-level continuous covariates at the top and bottom one percent to mitigate the impact of outliers.

¹⁷ <https://www.v-dem.net/publications/democracy-reports/> (Accessed: May 31, 2023).

¹⁸ <https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html> (Accessed: May 31, 2023).

¹⁹ <https://www.fraserinstitute.org/economic-freedom/approach> (Accessed: May 31, 2023).

²⁰ https://govdata360.worldbank.org/indicators/hh.mkt?country=BRA&indicator=2370&viz=line_chart&years=1988,2015 (Accessed: May 31, 2023).

offer size, which averages \$112.62 million for our sample. The average offer size is similar across the two subsamples. Research finds that credible intermediaries can certify an IPO for investors, reducing first-day returns (Carter and Manaster, 1990; Barry et al., 1990). We include controls for two such intermediaries. The first, *top underwriter*, is an indicator variable that identifies IPOs with an underwriter in the top 25 of SDC's global league tables for the IPO year. The second, *VC backed*, is an indicator variable set equal to one for firms that receive a venture capital investment prior to their IPO. We report that IPOs issued following unrest events are less likely to employ a top underwriter (12.5% versus 24.3%) and less likely to be VC backed (16.8% versus 22.2%).

Brav and Gompers (2003) posit that share lockups, which commit pre-IPO investors to hold their shares for a period after the IPO, can reduce moral hazard problems. The average *lockup length* is approximately 17.6 days longer for IPOs issued following an unrest event. Consistent with Sherman (2000), which notes that book building is the main method for taking firms public around the world, the majority of sample IPOs are *bookbuilt*. However, a smaller fraction of IPOs issued following unrest are *bookbuilt* (47.8%) compared to IPOs issued during quieter times (65.4%). *Firm commitment* is an indicator variable that identifies IPOs that are firm commitment offerings, which Ritter (1987) notes tend to be underpriced less than best efforts IPOs. IPOs are less likely to be *firm commitment* offerings when issued following an unrest event (59.8% versus 65.7%). *Carve-outs* are more common (20.1% versus 9.8%), while fewer *high tech* IPOs take place following unrest events (12.5% versus 20.3%).

We report a correlation matrix in Table 3. *Underpricing* is negatively correlated with the primary explanatory variable, *RSUI*. Pairwise correlations with *underpricing* range from -0.262 to 0.153 for the remaining variables. The low correlations, coupled with an average (maximum) variance inflation factor of 3.2 (6.38), suggest that multicollinearity is not a significant concern in our setting.

3. A stylized model of post-IPO returns

A key aspect of our paper is the interpretation we give to our results. We view IPO returns during times of social unrest as likely reflecting two main factors: lower investor sentiment and higher uncertainty. Our claim is that these likely have offsetting impacts on IPO returns. The latter should lower them, and the former should raise them. To be more concrete about the specific mechanisms we have in mind, here we outline a simple conceptual framework which captures these countervailing forces.

We consider a setting where an IPO is offered by a seller at an initial price p_0 . After the IPO, trading occurs and a new price, p_1 , is established. The realization of the secondary market price is unknown to the seller at the time of the IPO and is determined by investors' sentiments. As a result, the final price p_1 will typically depart from the seller's expectation at the time of the IPO, which we denote p_1^e . We thus write:

$$p_1 = p_1^e(1 + \epsilon)$$

where ϵ is a random variable capturing realized investor sentiment.²¹ We assume that the seller sets the IPO price at a discount to the expected price, with the discount increasing in the degree of uncertainty over the secondary market price,²² which we express as:

$$p_0 = p_1^e(1 - \gamma\sigma^2)$$

²¹ The multiplicative nature of the sentiment is not essential. It just makes the algebra easier later. Writing the same setting with an additive shock would be equivalent if the variance of the sentiment was scaled by p_1^e .

²² This could be thought of as a stylized form of the influence of uncertainty on underpricing posited in studies such as Ritter (1984), Booth and Smith (1986), and Beatty and Welch (1996).

where γ reflects the extent to which purchasers in the IPO must be compensated for bearing risk and σ^2 is the IPO seller's perceived variance of the post-IPO price.²³ If sellers were fully informed and rational then it would be the case that $\sigma^2 = Var \epsilon$, although we do not impose this.

It is straightforward to show that in this case, the post-IPO return (i.e. the extent of underpricing) is given by:

$$r = \log\left(\frac{p_1}{p_0}\right) = \log(1 + \epsilon) - \log(1 - \gamma\sigma^2)$$

This example should make clear that post-IPO returns are lower either when investor sentiment ϵ is worse. Likewise, they are higher when uncertainty σ^2 is high (or equivalently, when distaste for uncertainty is particularly large). However, changes to the expected price p_1^e have no effect on returns since they affect both the IPO and the post-IPO price.

Although we pick specific functional forms to make these mechanisms as stark as possible, it should be clear that they follow from two key assumptions – that the post-IPO price is uncertain, and that the IPO price is set at a discount reflecting (perceived) uncertainty – rather than the specific functional forms. It should also be clear that nature of the two channels are a little different. Uncertainty is an *ex ante* phenomenon; it is a property of the perceived distribution of risks. In contrast, sentiment is an *ex post* phenomenon; it is the realization of a shock. This timing distinction is crucial for the mechanisms we have in mind. If sentiments were well-known at the time of the IPO, they could be incorporated into the seller's expectation of future prices and so the IPO price would be adjusted to reflect this.

Finally, it is important to note that this stylized framework is particularly well-suited to modeling returns on an IPO (rather than any other asset) because of the assumption that investor

²³ Again, linearity is not essential here, nor are microfoundations. This example is chosen simply to make the mechanisms clear.

sentiments can be reasonably taken as unknown to the seller. With other assets, there is a history of previous prices and their correlation with either macroeconomic conditions or other assets. As a result, investor sentiment is likely to be well-understood and thus have no impact on returns (akin to changes in the expected price p_1^e).

4. Empirical results

4.1. IPO characteristics following unrest events

Before examining the influence of social unrest on IPO underpricing, we begin by comparing the characteristics of IPOs issued after unrest events to IPOs issued during more stable periods using a multivariate approach. The purpose of this analysis is to build upon the univariate results reported in Table 2. Namely, we want to determine if IPOs issued following periods of unrest differ substantially from other IPOs. To facilitate this comparison, we report the odds ratios from logistic regressions in Table 4 where the dependent variable is an indicator variable set equal to one for IPOs issued following an incident of social unrest, and zero otherwise. The first (last) four columns identify IPOs that take place within three (six) months of a social unrest incident. We report models that incorporate location fixed (random) effects in the first (last) two models in each group. Due to an absence of IPOs issued following social unrest, several markets are excluded from these models.

The results suggest that IPO markets exhibit weakness following incidents of social unrest incidents. Specifically, stronger *IPO activity* and *market returns* decrease the likelihood that an IPO is issued in the months following unrest. This is consistent with the negative relation between unrest and stock returns reported in other studies (e.g., Barrett et al., 2022b). The odds ratio for *liquidity* indicates IPOs issued after incidents of unrest are more common in more liquid markets.

Among the offering characteristics, only *bookbuilt* is consistently significant. The odds ratios are all less than one, which indicates that book built offerings are approximately 50 percent less common following incidents of unrest. It is possible that social unrest impedes the book building process, which could explain this result. The remaining variables provide some evidence IPO size, VC backing, firm commitment offerings, and carve-outs are associated with the likelihood that an IPO follows an incident of social unrest; however, these results are only evident in some of the models. Thus, with the exception of weaker prevailing market conditions (i.e., fewer IPOs and lower market returns), IPOs issued following periods of unrest do not appear to be markedly different than IPOs issued at other times.

4.2. *Social unrest and underpricing*

Our hypotheses offer competing predictions on the relation between social unrest and underpricing. On the one hand, if social unrest increases uncertainty about IPO firms, investors are more inclined to engage in information gathering, which would aggravate the winner's curse and result in an increase in the requisite underpricing (Beatty and Ritter, 1986; Ritter, 1984). On the other hand, if social unrest negatively impacts investor sentiment and aftermarket prices, underpricing should be lower when social unrest is elevated (Derrien, 2005; Cornelli et al., 2006). It is important to reiterate that these hypotheses are not mutually exclusive. Thus, our tests seek to determine which effect – uncertainty or investor sentiment – dominates.

In Table 5, we report the results of multivariate models that test the relation between *RSUI* and *underpricing*. In addition to the variables discussed in conjunction with Table 2, all models include industry and issue-year fixed effects. For brevity, we do not report the coefficients for the fixed effects. We also report *z*-statistics below each coefficient in parenthesis.

The first column reports our baseline, location fixed-effects model (Eq. (2)) which controls for time-invariant market factors. The coefficient for *RSUI* is negative and significant (*p*-value =

0.012). This suggests that the negative impact of social unrest on investor sentiment dominates the effect that social unrest has on uncertainty. Because Barrett et al. (2022a) find that past unrest is one of most reliable predictors of future unrest; we consider the possibility that lagged unrest, not contemporaneous unrest, drives the relation between the *RSUI* and underpricing. To isolate the new information contained in the contemporaneous unrest measure, we regress the contemporaneous *RSUI* on the prior month's *RSUI* ("lagged *RSUI*"). We include the residual from this regression and the lagged *RSUI* in the model reported in the second column. Consistent with the notion that it is contemporaneous unrest that drives the negative relation between the *RSUI* and underpricing, the coefficient for *residual RSUI* is negative and significant, while the coefficient for *lagged RSUI* is not statistically significant.

To demonstrate that the results are not unique to a specific econometric technique, we report the results using two methodologies commonly employed in the international IPO underpricing literature. The first, hierarchical linear modeling (HLM), accounts for the nested structure of our data while also capturing both within and between location effects. The second, weighted least squares (WLS), gives equal weight to each sample IPO market. In both instances, the coefficient for *RSUI* is negative and significant, which supports the investor sentiment hypothesis.

We report an alternative specification in the final column of Table 5. We add an indicator variable for IPOs issued in locations with an above median uncertainty avoidance score. According to Hofstede (2001), a high uncertainty avoidance score indicates that a society is uncomfortable with uncertainty and ambiguity. The negative coefficient for *RSUI* is consistent with the notion that social unrest is associated with lower investor sentiment. However, the positive coefficient for the interaction term indicates that the effect is weaker where uncertainty avoidance is high, which we posit is due to aversion to uncertainty. Given the positive correlation between uncertainty and

underpricing, this effect partially offsets lower underpricing caused by a decrease in investor sentiment.

Many of control variables are significantly correlated with underpricing. We find consistent evidence that IPOs are underpriced less (more) in economies with higher *financial integration* and *economic freedom (democracy)* scores. The positive coefficients for *IPO activity* and *market return* are consistent with a hot market effect. *Offer size* indicates that larger IPOs tend to be underpriced less than smaller offerings (Ritter, 1984). Contrary to the notion that credible intermediaries reduce underpricing, the coefficients for *top underwriter* and *VC backed* are positive, which is consistent with studies that consider the relation between underwriter reputation, venture capital backing, and underpricing (Beatty and Welch, 1996; Loughran and Ritter, 2004). Consistent with Brav and Gompers (2003), which suggests that share lockups reduce adverse selection problems, *underpricing* and *lockup length* are negatively correlated. *Bookbuilt* offerings tend to exhibit lower underpricing than other types, while *high tech* firms are underpriced more than firms from other industries.

The negative association between unrest and underpricing reported in Table 5 indicates that, when it comes to IPO underpricing, social unrest's negative influence on investor sentiment, which is associated with lower first-day returns, dominates any increase in uncertainty that would result in higher first-day returns. In subsequent sections, we discuss additional analysis that addresses potential endogeneity concerns and explores factors that might exacerbate or moderate social unrest's impact on underpricing.

4.3. Instrumental variable analysis

There are several potential concerns about the analysis presented thus far. For example, if we have omitted relevant variables from our baseline model, our coefficient estimates could be biased. Instrumental variable analysis is a common technique for addressing omitted variables and other

forms of model misspecification. This requires us to identify instruments that have a significant effect on social unrest, but only impact underpricing through this association. Prior research on the determinants of social unrest provide several interesting possibilities. First, Barrett et al. (2022a) find that unrest increases the potential for unrest in neighboring economies over the following six months by one percentage point. Therefore, we follow Hadzi-Vaskov et al. (2023) and use social unrest events in neighboring economies as an instrument for social unrest where the IPO is issued. Specifically, we set *neighbor unrest* equal to one for IPOs issued in a market where a neighbor has experienced an unrest event in the preceding six months, and zero otherwise. As an alternative aimed at capturing regional waves of unrest, *neighbor unrest (#)* identifies the number of neighbors that experience an unrest event in the preceding six months. Redl and Hlatshwayo's (2021) finding that tough economic conditions fuel unrest motivates our second instrument. We construct the *misery index* by adding the unemployment rate to the inflation rate. The strong influence of regional unrest and economic conditions suggest that these instruments are correlated with social unrest in the IPO firm's market (i.e., the relevance condition). While the exclusion restriction is difficult to verify, we believe that any influence these measures have on underpricing should be due to their impact on unrest in the IPO firm's market. We estimate the following two-stage least squares, location fixed effect model:

$$RSUI_{ijt} = \alpha_1 + \alpha_2 Neighbor\ unrest_{ijt} + \alpha_3 Misery\ index_{ijt} + \gamma X_{ijt} + \mu_i + \gamma_j + \alpha_t + \varepsilon_{1ijt}, \quad (3)$$

$$Underpricing_{ijt} = \beta_1 + \beta_2 RSUI'_{ijt} + \theta X_{ijt} + \mu_i + \gamma_j + \alpha_t + \varepsilon_{2ijt}, \quad (4)$$

where *neighbor unrest_{ijt}* is an indicator variable set equal to one if a neighbor experienced an incident of social unrest in the six months preceding the IPO (or, alternatively, the number of neighbors that experience an incident of social unrest in the six months prior to the IPO); *misery index_{ijt}* is the sum of the unemployment and inflation rates in the IPO firm's location; *RSUI'_{ijt}* is

the instrumented RSUI for firm i issued in location j in month t ; X_{ijt} is a vector of control variables measured for the IPO of firm i ; μ_i , γ_j , and α_t are industry, location, and issue year effects, respectively; and ε_{1ijt} and ε_{2ijt} are the regression residuals. As was the case in Table 5 (and in tables that follow), we use the log transformation of $RSUI$ in our 2SLS analysis.

We report the results in Table 6. The positive coefficients for *neighbor unrest* and *neighbor unrest (#)* in the first-stage regressions are consistent with prior research that suggests that social unrest has spillover effects (e.g., Barrett et al., 2022a). Tougher economic conditions also exhibit a positive association with social unrest. The negative coefficients for $RSUI'$ in the second-stage regressions provide additional support for a negative relation between social unrest and underpricing and helps alleviate concerns that this finding is the result of model misspecification. The 2SLS regressions produce larger coefficient estimates for $RSUI$ than the regressions reported in Table 5. One potential explanation is that an omitted variable introduces a downward bias in the Table 5 estimates. It could also be the case that contemporaneous $RSUI$ is a noisy measure of social unrest, which biases prior estimates toward zero. At the bottom of the table, we report the results of several tests that provide support for our instrumental variables approach. Significant Anderson and Hausman tests reject underidentification and confirm that we should treat $RSUI$ as endogenous, respectively. The Anderson-Rubin, Cragg-Donald, and Stock-Yogo statistics reject weak instruments.

4.4. Institutional quality

One of the primary advantages of our international setting is that it allows us to consider the possibility that other characteristics influence the relation between social unrest and underpricing. Prior research finds that institutional quality affects the relation between social unrest and GDP (Hadzi-Vaskov et al., 2023) and social unrest and stock prices (Barrett et al., 2022b). Evidence on the relation between institutional quality and underpricing is mixed (e.g., Engelen and van Essen,

2010; Boulton et al., 2010; Autore et al. 2014). According to Schmeling (2009), high-quality institutions weaken the association between investor sentiment and aggregate stock market returns. If this effect extends to IPO underpricing, high-quality institutions should moderate the negative relation between social unrest and underpricing. An alternative possibility is that high-quality institutions reduce uncertainty while leaving investor sentiment largely unaffected. In such a case, the impact of social unrest on investor sentiment should be more apparent for IPOs issued in locations with high-quality institutions.

We use the Worldwide Governance Indicators reported by the World Bank to explore the role that institutional quality plays in the relation between social unrest and underpricing.²⁴ The six measures include control of corruption, government effectiveness, political stability, regulatory quality, rule of law, and voice and accountability. The correlations between these measures and *RSUI* range from -0.193 (political stability) to -0.118 (rule of law). We add these institutional quality measures and their interactions with *RSUI* to the models reported in Table 7. Each column reports the results for a different measure. We follow related studies and utilize HLM in these tests to account for the nested structure of our data while also capturing both within and between market effects.

The column headings identify the institutional quality measure added to each model. Consider, for example, the first column, where we add the control of corruption measure and its interaction with *RSUI* to our baseline regression model. The coefficient for *RSUI* remains negative and significant in every model. Thus, in isolation greater social unrest is associated with lower underpricing. However, the positive coefficient for the interaction term suggests that institutional quality moderates this effect. Like Schmeling (2009), we interpret this as evidence that high-

²⁴ <https://info.worldbank.org/governance/wgi/> (Accessed: May 31, 2023).

quality institutions weaken the link between investor sentiment and IPO returns. The results are similar for the institutional quality measures reported in subsequent columns. In every case, higher-quality institutions moderate the negative relation between *RSUI* and underpricing.

4.5. Limits to arbitrage

Baker and Wurgler (2006) predict that limits to arbitrage should exacerbate the effect of a wave of investor sentiment on security prices. Consistent with their prediction, they find that short selling constraints magnify the impact of investor sentiment on security mispricing. We exploit differences in short sale constraints across markets to explore the role that limits to arbitrage play in the relation between social unrest and underpricing. We use information reported in Boulton et al. (2020) to construct indicator variables that identify markets with short selling bans, security lending bans, and where short selling is not typically practiced. In our sample, 18.4% of IPOs are issued in a market with a short selling ban, 20.3% are issued in a market with a security lending ban, and 34.4% are issued in a market where short selling is not practiced. We interact *RSUI* with these indicator variables to consider the possibility that short sale constraints exacerbate the negative relation between social unrest and underpricing. We report the results in Table 8.

The column headings identify the short sale constraint considered in each model. The coefficients for *RSUI* are not statistically significant in any of the three models. Consistent with Boulton et al. (2020), we find that IPOs tend to be underpriced more when short selling is constrained. However, the coefficient for the interaction terms are negative and highly significant, which indicates that short sale constraints magnify the negative relation between social unrest and underpricing. The linear combination of the coefficients for *RSUI* and the interaction term, which we report at the bottom of Table 8, captures the complete effect of *RSUI* on *underpricing* for IPOs where short selling is constrained. The results indicate that markets where short selling is

constrained by outright short selling bans, security lending bans, or an absence of short selling drive the negative impact of social unrest on underpricing.

4.6. Nonlinearity

The fact that social unrest affects both uncertainty and investor sentiment suggests that the relation between $RSUI$ and *underpricing* may be nonlinear. For example, mild social unrest may increase uncertainty but not have a significant effect on investor sentiment. However, when unrest is more severe, its effect on investor sentiment might become more prominent. We consider this possibility in Figure 3, which plots the predicted values for *underpricing* from a regression of *underpricing* on $RSUI$ and $RSUI^2$. The result is an inverse U-shaped relation. At low levels of $RSUI$, social unrest appears to have a slightly positive effect on underpricing, which is consistent with the notion that mild social unrest increases uncertainty for IPO participants. However, the effect of social unrest on investor sentiment quickly becomes apparent, as greater unrest is associated with lower underpricing at (log) $RSUI$ values greater than 3.10.

We formalize this result in our full regression model in Table 9, where we repeat our primary regression from Table 5 but using a nonlinear specification. Namely, we include $RSUI$ and its squared value as the main independent variables to allow for nonlinearity. Control variables are the same as in prior models. The results are consistent with the inverse U-shape reported in Figure 3; the coefficient on $RSUI$ is positive and the coefficient on the squared term of $RSUI$ is negative, which suggests that the uncertainty effect dominates at low levels of social unrest, but is overwhelmed by the investor sentiment effect at higher levels of social unrest.

4.7. Additional robustness

In Table 10, we consider the robustness of the relation between $RSUI$ and underpricing to alternative return measures. For example, measuring returns beyond the IPO date helps negate the impact of daily volatility limits imposed in some markets (e.g., France, Greece, and Thailand) and

ensures that we capture the full underpricing effect in less efficient markets. The first two columns measure underpricing using the 10th and 22nd secondary market closing price, respectively. The results continue to support the negative relation between social unrest and underpricing. The magnitude of the coefficients is slightly larger than what we reported in Table 5, which suggests that the impact of social unrest on initial returns is often not fully realized on the first trading day.

Barry and Jennings (1993) note that the most widely-accepted underpricing theories suggest that underpricing acts as compensation for investors who receive IPO allocations, which predicts that prices should adjust to true value immediately in the secondary market (Rock, 1986; Benveniste and Spindt, 1989). However, others suggest that information cascades could extend the price adjustment well into the first trading day (Welch, 1992). This leads us to separate the first-day return into two pieces. In the third column, we consider the *offer-to-open* return, which is the return measured from the IPO offer price to the first-day opening price. In the fourth column, we consider the *open-to-close* return, which is the return measured from the first-day opening price to the first-day closing price. *Offer-to-open* represents the compensation for information production, which *open-to-close* captures the impact of information cascades. The results indicate that *offer-to-open* returns drive the negative relation between *RSUI* and *underpricing*. We find no evidence that information cascades contribute to this relation.

We also consider the possibility that markets with large numbers of IPOs or extreme *RSUI* values, or both, drive the relation between social unrest and underpricing. In Table 11, we report the robustness of the results to the exclusion of potentially influential markets. In the first four columns, we individually exclude four markets with large numbers of IPOs (Mainland China, Hong Kong SAR, U.K., and U.S.). The next four columns exclude four markets with notable average levels of social unrest (Austria, Netherlands, Sweden, and Türkiye). The final column excludes the nine markets with no reported incidents of unrest during our sample period (Australia,

Canada, Ireland, Japan, New Zealand, Norway, Singapore, South Korea, and the U.S). Contrary to the notion that individual markets drive our results, the negative relation between social unrest and underpricing is evident in every instance.

5. Conclusion

Hadzi-Vaskov et al. (2023) note that social unrest simultaneously lowers investor sentiment and increases uncertainty. In some settings, investor sentiment and uncertainty are associated with different outcomes. Such is the case with initial public offerings (IPOs). For instance, Ljungqvist et al. (2006) suggest that underpricing compensates investors who receive IPO allocations for the possibility that investor sentiment changes before they can sell their shares in the aftermarket. Consequently, we would expect a positive relation between investor sentiment and underpricing as an increase in investor sentiment during the first trading day would result in a greater increase to the stock closing price on day one. However, if social unrest lowers investor sentiment, the opposite should be true. In such cases, IPOs that take place during periods of unrest should exhibit lower first-day returns. Theory predicts that increased uncertainty has the opposite effect. When uncertainty is high, the incentive to gather information increases, which exacerbates information disparities among IPO participants. This leads to the prediction of a positive association between social unrest and first-day returns, as unrest magnifies uncertainty and necessitates greater underpricing to mitigate risks.

We construct a large sample of IPOs issued in 36 markets between 1998 and 2018 in an effort to determine which effect dominates. We find robust evidence that the negative impact of social unrest on investor sentiment outweighs the effect that social unrest has on uncertainty. Specifically, we consistently find that greater social unrest is associated with lower IPO underpricing. We confirm this result in a 2SLS setting that uses the social unrest of neighbors and the misery index

to instrument for social unrest in the IPO market and issue month to address model misspecification concerns. Social unrest and underpricing remain negatively correlated in this analysis.

A primary advantage of our international sample is that it allows us to explore other factors that could moderate the impact of social unrest on underpricing. For example, we find that the negative association between unrest and underpricing is weaker in markets with greater uncertainty avoidance. Presumably, social unrest has a stronger impact on uncertainty in these locations. Second, we find that the negative relation between social unrest and underpricing is weaker for IPOs issued in places with higher-quality institutions that weaken the link between investor sentiment and stock returns (Schmeling, 2009). Third, consistent with prior research, we find that limits to arbitrage amplify the negative relation between social unrest and underpricing.

To our knowledge, this is the first study to document a significant relation between social unrest and underpricing. We highlight the competing effects – investor sentiment and uncertainty – of social unrest on financial markets. Thus, IPO issuers and their advisors must weigh these effects when deciding whether and at what price to take their firms public, while investors must do the same when deciding whether and at what price to invest in initial public offerings.

References

- Autore, D., Boulton, T., Smart, S., & Zutter, C. (2014). The impact of institutional quality on initial public offerings. *Journal of Economic and Business*, 73, 65–96.
- Bajo, E., & Raimondo, C. (2017). Media sentiment and IPO underpricing. *Journal of Corporate Finance*, 46, 139–153.
- Baker, E., Boulton, T., Braga-Alves, M., & Morey, M. (2021). ESG government risk and international IPO underpricing. *Journal of Corporate Finance*, 67, 101913.
- Baker, M., & Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *Journal of Finance*, 61, 1645–1680.
- Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives*, 21, 129–151.
- Barrett, P., Appendino, M., Nguyen, K., & Miranda, J. (2022a). Measuring social unrest using media reports. *Journal of Development Economics*, 158, 102924.
- Barrett, P., Bodnar, M., Chen, S., & Chivakul, M. (2022b). Pricing protest: The response of financial markets to social unrest. *IMF Working Paper*.
- Barry, C., & Jennings, R. (1993). The opening price performance of initial public offerings of common stock. *Financial Management*, 22, 54–63.
- Barry, C., Muscarella, C., Peavy, J., & Vetsuypens, M. (1990). The role of venture capital in the creation of public companies. *Journal of Financial Economics*, 27, 447–471.
- Beatty, R., & Ritter, J. (1986). Investment banking, reputation, and the underpricing of initial public offerings. *Journal of Financial Economics*, 15, 213–232.
- Beatty, R., & Welch, I. (1996). Issuer expenses and legal liability in initial public offerings. *Journal of Law and Economics*, 39, 545–602.
- Benveniste, L., & Spindt, P. (1989). How investment bankers determine the offer price and allocate new issues. *Journal of Financial Economics*, 24, 343–361.
- Bhattacharya, U., Daouk, H., & Welker, M. (2003). The world price of earnings opacity. *The Accounting Review*, 78, 641–678.
- Booth, J., & Smith, R. (1986). Capital raising, underwriting and the certification hypothesis. *Journal of Financial Economics*, 15, 261–281.
- Borisov, A., Ellul, A., & Sevilir, M. (2021). Access to public capital markets and employment growth. *Journal of Financial Economics*, 141, 896–918.
- Boulton, T. (2022). Economic policy uncertainty and international IPO underpricing. *Journal of International Financial Markets, Institutions & Money*, 81, 101689.
- Boulton, T., Smart, S., & Zutter, C. (2010). IPO underpricing and international corporate governance. *Journal of International Business Studies*, 41, 206–222.
- Boulton, T., Smart, S., & Zutter, C. (2011). Earnings quality and international IPO underpricing. *The Accounting Review*, 86, 483–505.

- Boulton, T., Smart, S., & Zutter, C. (2017). Conservatism and international IPO underpricing. *Journal of International Business Studies*, 48, 763–785.
- Boulton, T., Smart, S., & Zutter, C. (2020). Worldwide short selling regulations and IPO underpricing. *Journal of Corporate Finance*, 62, 101596.
- Brav, A., & Gompers, P. (2003). The role of lockups in initial public offerings. *Review of Financial Studies*, 16, 1–29.
- Carter, R., & Manaster, S. (1990). Initial public offerings and underwriter reputation. *Journal of Finance*, 45, 1045–1067.
- Chen, H., & Yang, S. (2020). Do investors exaggerate corporate ESG information? Evidence of the ESG momentum effect in the Taiwanese market. *Pacific-Basin Finance Journal*, 63, 101407.
- Chen, Y., Goyal, A., Veeraraghavan, M., & Zolotoy, L. (2020). Terrorist attacks, investor sentiment, and the pricing of initial public offerings. *Journal of Corporate Finance*, 65, 101780.
- Chourou, L., Saadi, S., & Zhu, H. (2018). How does national culture influence IPO underpricing? *Pacific-Basin Finance Journal*, 51, 318–341.
- Cornelli, F., Goldreich, D., & Ljungqvist, A. (2006). Investor sentiment and pre-IPO markets. *Journal of Finance*, 61, 1187–1216.
- Derrien, F. (2005). IPO pricing in “hot” market conditions: who leaves money on the table? *Journal of Finance*, 60, 487–521.
- Dong, X., Meyer, J., Shmueli, E., Bozkaya, B., & Pentland, A. (2018). Methods for quantifying effects of social unrest using credit card transaction data. *EPJ Data Science*, 7, 1–25.
- Duong, H., Goyal, A., Kallinterakis, V., & Veeraraghavan, M. (2022). Democracy and the pricing of initial public offerings around the world. *Journal of Financial Economics*, 145, 322–341.
- Ellul, A., & Pagano, M. (2006). IPO underpricing and after-market liquidity. *Review of Financial Studies*, 19, 381–421.
- Engelen, P., & van Essen, M. (2010). Underpricing of IPOs: Firm-, issue- and country-specific characteristics. *Journal of Banking and Finance*, 34, 1958–1969.
- Espinosa-Méndez, C. (2022). Civil unrest and herding behavior: evidence in an emerging market. *Economic Research-Ekonomska Istraživanja*, 35, 1243–1261.
- Feng, Z., Chen, C., & Tseng, Y. (2018). Do capital markets value corporate social responsibility? Evidence from seasoned equity offerings. *Journal of Banking and Finance*, 94, 54–74.
- Hadzi-Vaskov, M., Pienknagura, S., & Ricci, L. (2023). The macroeconomic impact of social unrest. *The B.E. Journal of Macroeconomics*, Forthcoming.
- Hofstede, G. (2001). *Culture’s consequences: Comparing values, behaviors, institutions, and organizations across nations*. 2nd Edition. USA: Sage Publications.
- Kinnear, H., & Blanco, J. (2022). Cost of living crisis inflames civil unrest risks in emerging markets. <https://www.maplecroft.com/insights/analysis/cost-of-living-crisis-inflames-civil-unrest-risks-in-emerging-markets/> (Accessed: May 31, 2023).

- Klomp, J. (2021). The Arab Spring and the international defense market. *Business and Politics*, 23, 202–220.
- Kollias, C., & Tzeremes, P. (2022). The nexus between social unrest and economic growth in Middle East and Central Asia countries. *Review of Economics and Political Science*, 7, 74–86.
- Leone, A., Rock, S., & Willenborg, M. (2007). Disclosure of intended use of proceeds and underpricing in initial public offerings. *Journal of Accounting Research*, 45, 111–153.
- Ljungqvist, A., Nanda, V., & Singh, R. (2006). Hot markets, investor sentiment, and IPO pricing. *Journal of Business*, 79, 1667–1702.
- Ljungqvist, A., & Wilhelm, W. (2003). IPO pricing in the dot-com bubble. *Journal of Finance*, 58, 723–752.
- Loughran, T., & Ritter, J. (2004). Why has IPO underpricing changed over time? *Financial Management*, 33, 5–37.
- Marcato, G., Milcheva, S., & Zheng, C. (2018). Market integration, country institutions and IPO underpricing. *Journal of Corporate Finance*, 53, 87–105.
- Mazumder, S., & Saha, P. (2021). COVID-19: Fear of pandemic and short-term IPO performance. *Finance Research Letters*, 43, 101977.
- Redl C., & Hlatshwayo, S. (2021). Forecasting social unrest: A machine learning approach. *IMF Working Paper*.
- Ritter, J. (1984). The hot issue market of 1980. *Journal of Business*, 57, 215–240.
- Ritter, J. (1987). The costs of going public. *Journal of Financial Economics*, 19, 269–281.
- Rock, K. (1986). Why new issues are underpriced. *Journal of Financial Economics*, 15, 187–212.
- Schmeling, M. (2009). Investor sentiment and stock returns: Some international evidence. *Journal of Empirical Finance*, 16, 394–408.
- Sherman, A. (2000). IPOs and long-term relationships: An advantage of book building. *Review of Financial Studies*, 13, 697–714.
- Tanyeri, B., Savaser, T., & Usul, N. (2022). The stock and CDS market consequences of political uncertainty: The Arab Spring. *Emerging Markets Finance and Trade*, 58, 1821–1837.
- Welch, I. (1992). Sequential sales, learning and cascades. *Journal of Finance*, 47, 695–732.

Appendix – Variable definitions

Dependent variable

Underpricing

The first-day secondary market closing price divided by the IPO offer price, minus one. Sources: Datastream and SDC.

Main independent variables

RSUI

The Reported Social Unrest Index, which is measured as the fraction of all articles considered that indicate social unrest in a particular market. We rebase the RSUI to an average of 100 for each market over our 1998-2018 sample period. Source: Barrett et al. (2022a).

Primary control variables

Democracy

Index that measures the extent to which all social groups can participate in the political process. Source: V-Dem Institute

Financial integration

Financial globalization index. Source: KOF Swiss Economic Institute.

Economic freedom

Economic freedom summary index. Source: Fraser Institute.

Market concentration

Measure of dispersion of trade value across an exporter's partners. Source: World Bank.

Earnings management

The median ratio of total accruals over the lagged total assets for each market, measured over the five years preceding the IPO. Source: Bhattacharya et al. (2003).

IPO activity

Market-year ratio of the total number of IPOs divided by the number of publicly listed firms. Source: World Bank.

Market return

The return on the index for the listing market over the three months preceding the offering. Source: Datastream.

Liquidity

Market-level ratio of the total value of shares traded to aggregate market capitalization. Source: World Bank.

Offer size

The inflation-adjusted offer value in millions of USD. Source: SDC.

Top underwriter

Indicator variable set equal to one for IPOs underwritten by an investment bank in the top 25 of the league tables in the year of issuance. Source: SDC.

VC backed

Indicator variable set equal to one for IPOs that previously received VC funding. Source: SDC.

Lockup length

Days between the IPO issue date and the first lockup expiration date. Source: SDC.

Bookbuilt

Indicator variable set equal to one for bookbuilt IPOs. Source: SDC.

Firm commitment

Indicator variable set equal to one for firm commitment IPOs. Source: SDC.

Carve-out

Indicator variable set equal to one for equity carve-out IPOs. Source: SDC.

High tech

Indicator variable set equal to one for IPO firms in one of the high-tech SIC groupings identified by Ljungqvist and Wilhelm (2003). Source: SDC.

Instruments

Neighbor unrest

Indicator variable set equal to one if a neighbor had an unrest event in the previous six months. Source: Barrett et al. (2022a).

Neighbor unrest (#)

Number of neighbors that had an unrest event in the previous six months. Source: Barrett et al. (2022a).

Misery index

Sum of the unemployment rate and the inflation rate. Source: World Bank.

Institutional quality measures

Control of corruption

Indicator of the use of public power for private gain. Source: World Bank.

Government effectiveness

Indicator of public and private services quality and independence. Source: World Bank.

Political stability

Indicator of the likelihood of political instability and violence. Source: World Bank.

Regulatory quality

Indicator of the government's ability to implement policies that promote private sector development. Source: World Bank.

Rule of law

Indicator of the quality of contract enforcement, property rights, police, courts, and the likelihood of crime and violence. Source: World Bank.

Voice and accountability

Indicator of citizen participation in selecting government, freedom of expression, association, and the press. Source: World Bank.

Limits to arbitrage

Short selling not allowed

Indicator variable set equal to one for IPOs issued where short selling is banned. Source: Boulton et al. (2020).

<i>Security lending banned</i>	Indicator variable set equal to one for IPOs issued where security lending is banned. Source: Boulton et al. (2020).
<i>Short selling not practiced</i>	Indicator variable set equal to one for IPOs issued where short selling is not routinely practiced. Source: Boulton et al. (2020).
<u>Additional return measures</u>	
<i>Two-week return</i>	The 10 th -day secondary market closing price divided by the IPO offer price, minus one. Sources: Datastream and SDC.
<i>One-month return</i>	The 22 nd -day secondary market closing price divided by the IPO offer price, minus one. Sources: Datastream and SDC.
<i>Offer-to-open return</i>	The return measured from the IPO offer price to the first-day opening price. Sources: Datastream and SDC.
<i>Open-to-close return</i>	The return measured from the first-day opening price to the first-day closing price. Sources: Datastream.

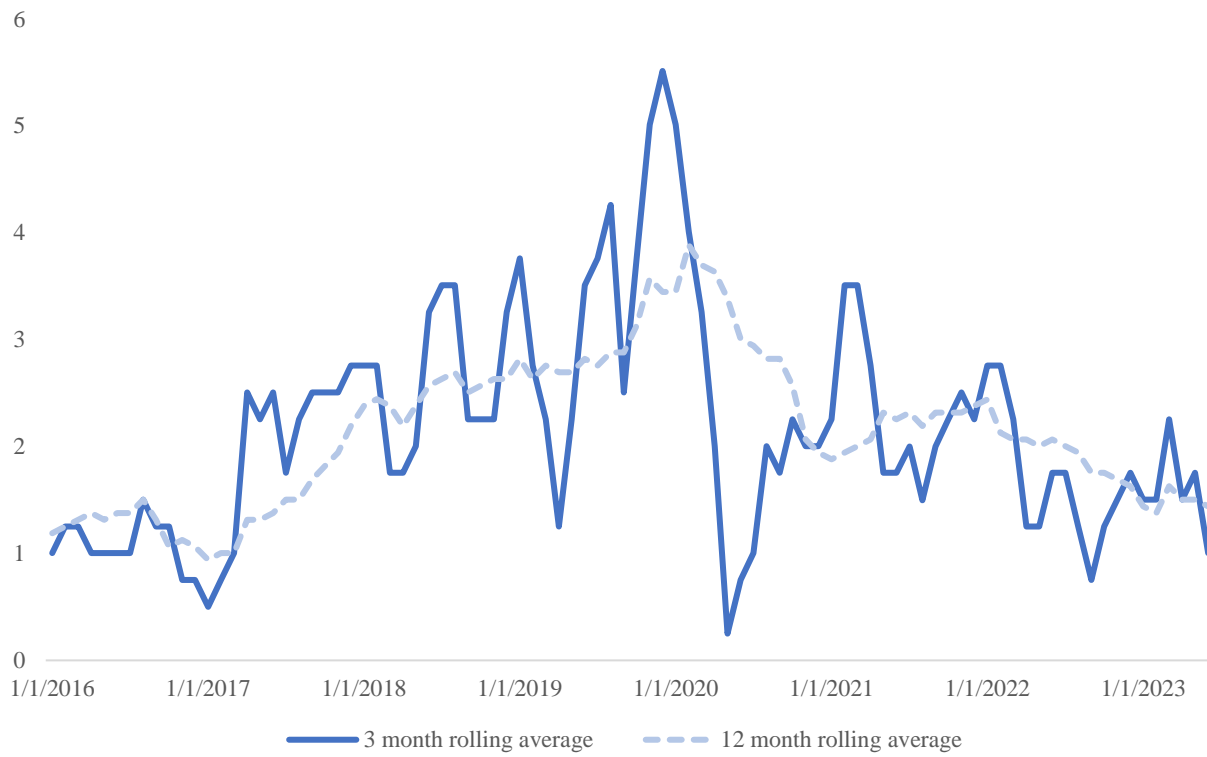


Figure 1: Fraction of markets experiencing a major unrest event (percent)

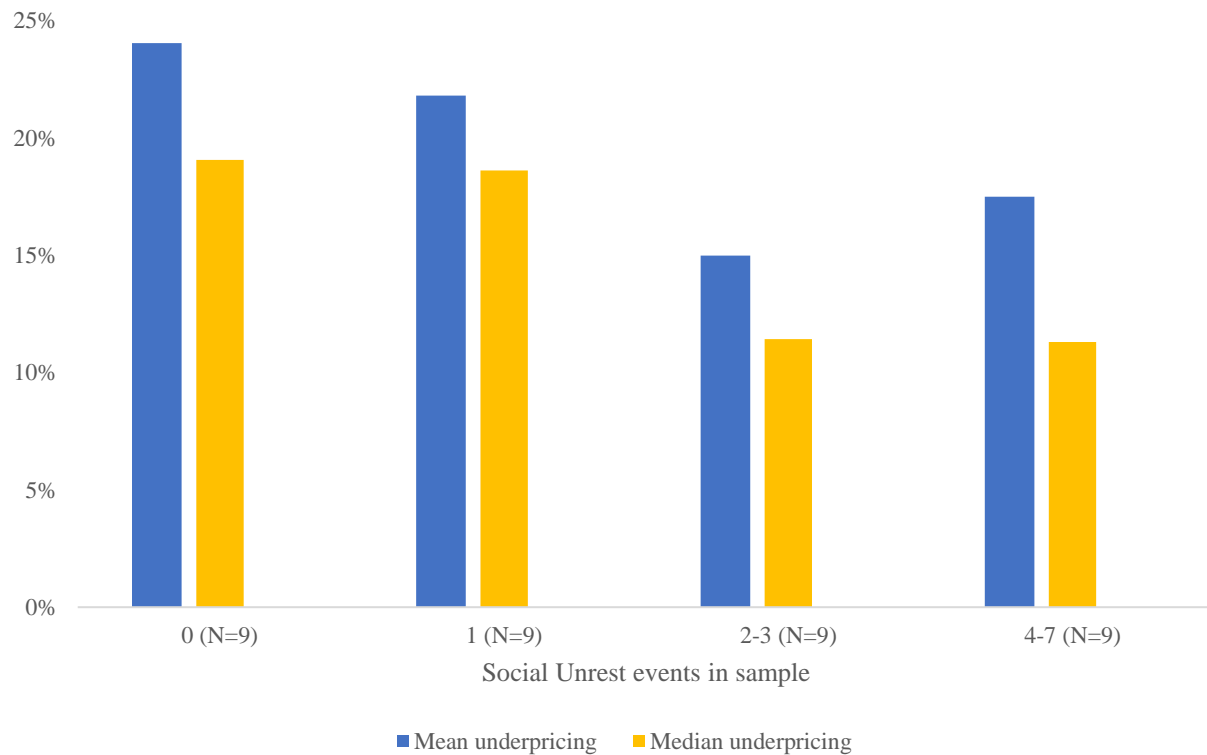


Figure 2: Underpricing as a function of frequency of social unrest. Numbers in parenthesis are the number of markets in each category.

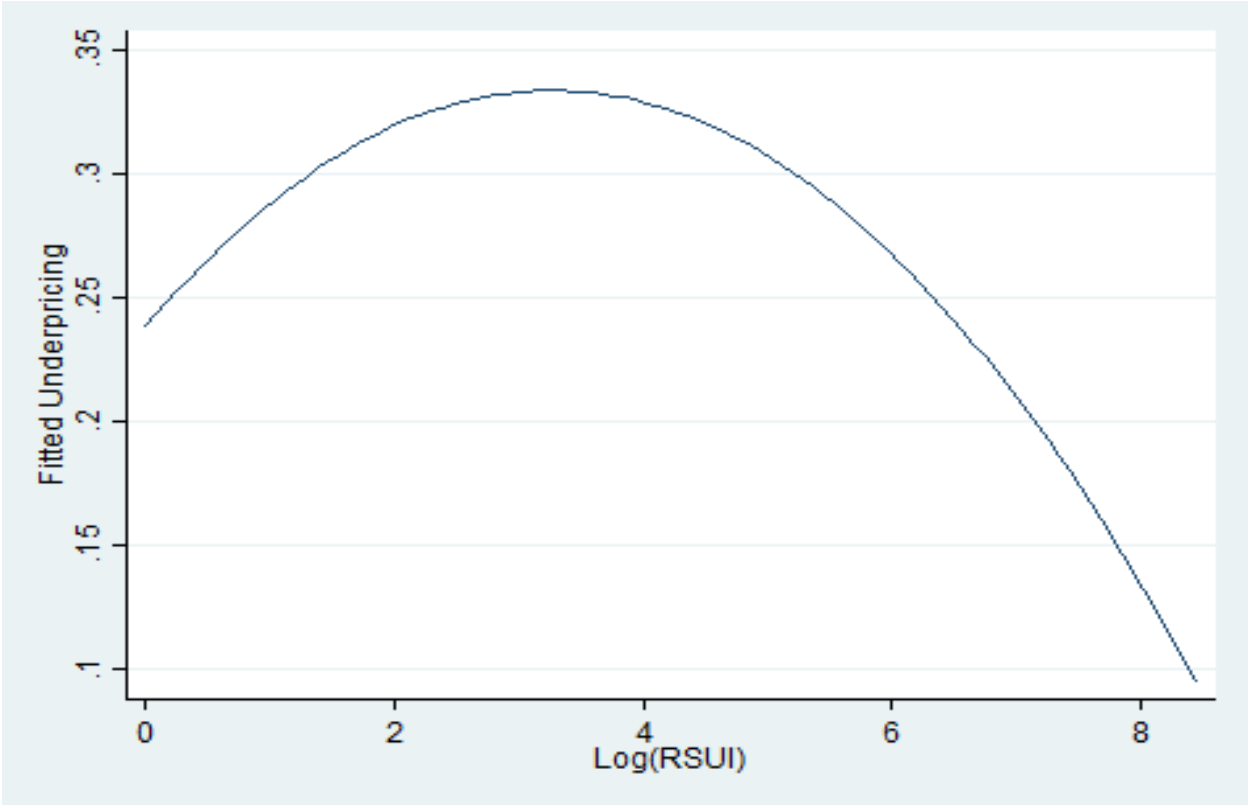


Figure 3: This figure plots predicted underpricing from a linear regression of underpricing on $RSUI$ and $RSUI^2$.

Table 1 – IPO market-level summary

IPO Market	IPOs	Average RSUI at IPO	Unrest Events	Underpricing
Argentina	1	112.80	2	1.08%
Australia	1,247	99.29	0	19.06%
Austria	24	123.16	2	5.47%
Belgium	69	50.83	4	7.15%
Brazil	54	91.54	5	3.38%
Canada	240	133.72	0	17.11%
Mainland China	2,357	115.28	1	62.00%
Denmark	44	89.31	1	7.42%
Finland	62	75.97	1	18.61%
France	649	76.71	4	13.22%
Germany	448	74.76	1	30.30%
Greece	112	10.59	5	61.25%
Hong Kong SAR	1,272	118.43	1	20.34%
India	497	128.67	1	20.28%
Indonesia	212	69.47	3	30.52%
Ireland	6	47.01	0	5.60%
Israel	2	103.59	4	-3.12%
Italy	206	74.39	1	11.70%
Japan	612	89.34	0	72.21%
Malaysia	424	52.10	2	30.20%
Mexico	6	147.86	3	4.97%
Netherlands	54	143.68	3	28.70%
New Zealand	55	62.01	0	7.85%
Norway	131	74.48	0	1.83%
Philippines	49	104.12	4	10.06%
Portugal	9	58.03	1	14.63%
Singapore	591	84.27	0	26.06%
South Africa	13	80.78	2	11.95%
South Korea	990	96.23	0	39.69%
Spain	65	86.32	1	10.95%
Sweden	178	115.59	2	10.48%
Switzerland	74	35.06	2	11.43%
Thailand	306	85.77	7	38.21%
Türkiye	85	207.48	6	11.29%
UK	1,349	74.37	5	16.01%
US	2,652	87.89	0	26.87%

This table reports market-level descriptive statistics for the sample of 15,145 IPOs issued from 1998-2018. IPOs reports the number of IPO observations. Average RSUI reports the value of the monthly RSUI averaged across all IPOs issued in a market; it is thus a measure of relative unrest *at the time of issuance*. Underpricing is the difference between the first-day secondary market closing price and the IPO offer price, divided by the IPO offer price.

Table 2 – Descriptive statistics

	Unrest		No unrest		Difference	<i>p</i> -value
	N	Mean	N	Mean		
<i>Underpricing</i>	184	0.233	14,961	0.314	-0.080	0.039
<i>RSUI</i>	184	637.012	14,961	88.001	549.011	0.000
<i>Democracy</i>	184	0.441	14,961	0.554	-0.113	0.000
<i>Financial integration</i>	184	71.590	14,961	71.598	-0.008	0.995
<i>Economic freedom</i>	184	7.373	14,961	7.716	-0.343	0.000
<i>Market concentration</i>	184	0.060	14,961	0.082	-0.022	0.000
<i>Earnings management</i>	184	-0.025	14,961	-0.031	0.006	0.000
<i>IPO activity</i>	184	0.043	14,961	0.053	-0.010	0.000
<i>Market return</i>	184	0.023	14,961	0.028	-0.005	0.477
<i>Liquidity</i>	184	1.137	14,961	1.146	-0.009	0.868
<i>Offer size</i>	184	116.928	14,961	112.569	4.359	0.804
<i>Top underwriter</i>	184	0.125	14,961	0.243	-0.118	0.000
<i>VC backed</i>	184	0.168	14,961	0.222	-0.054	0.081
<i>Lockup length</i>	184	126.288	14,961	108.688	17.600	0.105
<i>Bookbuilt</i>	184	0.478	14,961	0.654	-0.176	0.000
<i>Firm commitment</i>	184	0.598	14,961	0.657	-0.059	0.092
<i>Carve-out</i>	184	0.201	14,961	0.098	0.104	0.000
<i>High tech</i>	184	0.125	14,961	0.203	-0.078	0.009

This table reports IPO-level descriptive statistics for the sample of 15,145 IPOs issued from 1998-2018. The first two columns report the number of observations and average values for IPOs that take place in the three months following an unrest event. The middle two columns report the number of observations and average values for IPOs not affected by an unrest event within the past three months. The last two columns report the difference in the averages between the two subsamples and the *p*-value from a *t*-test of the difference. All variables are defined in the Appendix.

Table 3 – Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) <i>Underpricing</i>	1.000																
(2) <i>RSUI</i>	-0.029	1.000															
(3) <i>Democracy</i>	-0.179	-0.076	1.000														
(4) <i>Financial integration</i>	-0.262	-0.046	0.531	1.000													
(5) <i>Economic freedom</i>	-0.232	-0.036	0.593	0.855	1.000												
(6) <i>Market concentration</i>	0.031	0.020	0.073	-0.040	0.006	1.000											
(7) <i>Earnings management</i>	0.153	0.081	-0.665	-0.553	-0.474	-0.102	1.000										
(8) <i>IPO activity</i>	0.088	-0.069	-0.218	0.005	-0.146	-0.179	0.061	1.000									
(9) <i>Market return</i>	0.150	-0.030	-0.015	-0.054	-0.051	-0.019	-0.017	-0.004	1.000								
(10) <i>Liquidity</i>	0.080	0.057	-0.165	-0.407	-0.286	-0.113	0.282	0.092	0.044	1.000							
(11) <i>Offer size</i>	-0.088	0.007	0.034	0.046	0.044	-0.048	-0.044	-0.053	0.018	0.061	1.000						
(12) <i>Top underwriter</i>	-0.024	0.000	0.087	0.037	0.136	-0.114	-0.025	-0.072	0.002	0.201	0.426	1.000					
(13) <i>VC backed</i>	0.072	0.019	0.041	-0.108	0.022	-0.071	0.079	-0.080	-0.006	0.287	-0.017	0.287	1.000				
(14) <i>Lockup length</i>	-0.059	0.079	-0.195	-0.273	-0.156	-0.094	0.256	-0.173	0.001	0.325	0.065	0.115	0.163	1.000			
(15) <i>Bookbuilt</i>	-0.068	-0.008	0.055	0.054	0.125	-0.272	0.067	0.062	-0.018	0.244	0.208	0.362	0.315	0.195	1.000		
(16) <i>Firm commitment</i>	0.031	0.107	-0.353	-0.317	-0.133	-0.135	0.352	-0.146	0.021	0.247	0.038	0.150	0.211	0.345	0.140	1.000	
(17) <i>Carve-out</i>	-0.051	0.089	-0.043	0.012	0.020	-0.042	0.086	-0.082	-0.030	0.045	0.202	0.118	-0.054	0.116	0.113	0.082	1.000
(18) <i>High tech</i>	0.085	-0.033	0.137	0.064	0.098	-0.040	-0.052	0.039	0.002	0.067	-0.024	0.107	0.176	-0.034	0.130	-0.020	-0.067

This table reports correlations for the sample of 15,145 IPOs issued from 1998-2018. All variables are defined in the Appendix.

Table 4 – Characteristics of IPOs following unrest events

	IPO within three months of unrest event				IPO within six months of unrest event			
	Location FE	Location FE	Location RE	Location RE	Location FE	Location FE	Location RE	Location RE
<i>IPO activity</i>	0.0000*** (-4.31)	0.0000*** (-4.33)	0.0000*** (-4.31)	0.0000*** (-4.41)	0.0000*** (-4.62)	0.0000*** (-4.87)	0.0000*** (-4.59)	0.0000*** (-4.87)
<i>Market return</i>	0.0646*** (-3.36)	0.2631** (-2.20)	0.0678*** (-3.31)	0.2717** (-2.15)	0.4959 (-0.62)	0.4835 (-0.92)	0.4822 (-0.65)	0.4883 (-0.91)
<i>Liquidity</i>	4.1936*** (11.11)	3.3155*** (15.01)	4.1025*** (11.15)	3.2833*** (15.06)	4.7298*** (4.40)	1.2844* (1.91)	4.0021*** (4.31)	1.2762* (1.86)
<i>Offer size</i>	0.9005** (-2.14)	1.0127 (0.29)	0.9028** (-2.09)	1.0150 (0.35)	0.9078 (-1.50)	1.0206 (0.35)	0.9142 (-1.39)	1.0284 (0.49)
<i>Top underwriter</i>	0.9865 (-0.07)	0.8176 (-1.06)	1.0105 (0.05)	0.8224 (-1.03)	1.0604 (0.20)	0.7104 (-1.28)	1.0911 (0.30)	0.7140 (-1.25)
<i>VC backed</i>	0.8340 (-1.02)	1.1578 (0.88)	0.8205 (-1.11)	1.1407 (0.79)	1.0457 (0.18)	1.5680* (1.93)	1.0167 (0.07)	1.5235* (1.81)
<i>Lockup length</i>	1.0179 (0.60)	1.0493* (1.88)	1.0180 (0.61)	1.0507* (1.93)	1.0042 (0.11)	1.0463 (1.35)	1.0014 (0.04)	1.0469 (1.37)
<i>Bookbuilt</i>	0.4483*** (-4.68)	0.4951*** (-4.86)	0.4502*** (-4.65)	0.4949*** (-4.86)	0.4530*** (-3.62)	0.5157*** (-3.59)	0.4557*** (-3.60)	0.5120*** (-3.62)
<i>Firm commitment</i>	1.1422 (0.67)	1.4507** (2.32)	1.1189 (0.57)	1.4265** (2.22)	0.9464 (-0.22)	1.4878* (1.92)	0.9289 (-0.29)	1.4357* (1.75)
<i>Carve-out</i>	0.9875 (-0.08)	1.4564** (2.41)	0.9827 (-0.10)	1.4600** (2.42)	1.1766 (0.71)	1.8610*** (3.00)	1.1637 (0.66)	1.8816*** (3.04)
<i>High tech</i>	1.2505 (0.43)	1.4721 (0.78)	1.2483 (0.42)	1.4714 (0.77)	0.7812 (-0.41)	0.8385 (-0.31)	0.7657 (-0.45)	0.8305 (-0.33)
<i>Constant</i>			0.0001*** (-5.30)	0.0021*** (-8.12)			0.0005*** (-4.86)	0.0055*** (-6.59)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Issue year fixed effects	Yes	No	Yes	No	Yes	No	Yes	No
Observations	8,313	8,313	11,789	15,145	8,038	8,038	11,789	15,145
Number of locations	19	19	36	36	17	17	36	36

This table reports odds ratios from logistic regressions that examine IPO characteristics. The dependent variable in the first (last) four columns is an indicator variable set equal to one for IPOs issued in the three (six) months following a social unrest event. All variables are defined in the Appendix. The numbers between parentheses below each coefficient are the z -statistics. Respectively, ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent level.

Table 5 – Social unrest and underpricing

	Location FE	Location FE	HLM	WLS	HLM
<i>RSUI</i>	-0.0089** (-2.52)		-0.0083** (-2.38)	-0.0052** (-2.56)	-0.0149*** (-3.41)
<i>Residual RSUI</i>		-0.0094*** (-2.60)			
<i>Lagged RSUI</i>		-0.0027 (-0.76)			
<i>High uncertainty avoidance</i>					-0.2146** (-2.44)
<i>RSUI × High uncertainty avoidance</i>					0.0167** (2.48)
<i>Democracy</i>	0.3936*** (2.66)	0.3900*** (2.64)	0.2646** (2.37)	-0.1112*** (-5.34)	0.3331*** (2.88)
<i>Financial integration</i>	-0.0080*** (-5.12)	-0.0080*** (-5.12)	-0.0076*** (-5.51)	-0.0040*** (-8.50)	-0.0077*** (-5.61)
<i>Economic freedom</i>	-0.1289*** (-5.84)	-0.1279*** (-5.78)	-0.1198*** (-5.81)	0.0232*** (2.84)	-0.1236*** (-5.98)
<i>Market concentration</i>	0.0369 (0.14)	0.0414 (0.16)	0.0216 (0.10)	0.1927*** (5.20)	-0.0012 (-0.01)
<i>Earnings management</i>	-2.9795*** (-5.56)	-2.9628*** (-5.52)	-2.9082*** (-5.61)	1.0095*** (4.13)	-2.9221*** (-5.64)
<i>IPO activity</i>	-0.7682*** (-4.64)	-0.7709*** (-4.66)	-0.7434*** (-4.57)	1.1591*** (10.58)	-0.7103*** (-4.36)
<i>Market return</i>	0.7868*** (17.49)	0.7875*** (17.50)	0.7883*** (17.54)	0.8681*** (21.50)	0.7902*** (17.58)
<i>Liquidity</i>	-0.0945*** (-9.97)	-0.0944*** (-9.97)	-0.0924*** (-9.93)	0.0473*** (7.60)	-0.0924*** (-9.93)
<i>Offer size (log)</i>	-0.0437*** (-13.69)	-0.0437*** (-13.69)	-0.0433*** (-13.62)	-0.0302*** (-12.22)	-0.0435*** (-13.67)
<i>Top underwriter</i>	0.0401*** (3.46)	0.0401*** (3.46)	0.0395*** (3.41)	0.0014 (0.14)	0.0398*** (3.44)
<i>VC backed</i>	0.0331*** (2.96)	0.0331*** (2.96)	0.0336*** (3.01)	0.0877*** (8.33)	0.0336*** (3.01)
<i>Lockup length (log)</i>	-0.0208*** (-10.25)	-0.0208*** (-10.23)	-0.0207*** (-10.25)	-0.0039** (-2.47)	-0.0207*** (-10.23)
<i>Bookbuilt</i>	-0.0574*** (-4.90)	-0.0572*** (-4.88)	-0.0605*** (-5.24)	0.0067 (0.76)	-0.0592*** (-5.12)
<i>Firm commitment</i>	0.0151 (1.23)	0.0151 (1.23)	0.0159 (1.30)	0.0725*** (7.96)	0.0160 (1.30)
<i>Carve-out</i>	0.0317** (2.28)	0.0315** (2.27)	0.0313** (2.26)	0.0126 (1.14)	0.0308** (2.22)
<i>High tech</i>	0.0988*** (3.21)	0.0990*** (3.21)	0.0982*** (3.19)	0.0563** (2.11)	0.0987*** (3.21)
<i>Constant</i>	1.8691*** (8.30)	1.8400*** (8.16)	1.6652*** (9.16)	0.5346*** (10.64)	1.7883*** (9.60)
<i>RSUI + Interaction</i>					0.0018

					(0.34)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Issue year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	15,145	15,145	15,145	15,144	15,145
R-squared	0.137	0.137		0.144	
Number of locations	36	36	36		36

This table reports the results of multivariate models that examine the relation between *RSUI* and *underpricing*. All variables are defined in the Appendix. The numbers between parentheses below each coefficient are the *z*-statistics. Respectively, ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent level.

Table 6 – Endogeneity

	First-stage	Second-stage	First-stage	Second-stage
<i>RSUI'</i>		-0.0867* (-1.70)		-0.1215*** (-2.97)
<i>Neighbor unrest</i>	0.2672*** (8.40)			
<i>Neighbor unrest (#)</i>			0.2410*** (10.80)	
<i>Misery index</i>	0.0069 (1.53)		0.0089** (1.98)	
<i>Democracy</i>	2.2712*** (6.65)	0.5667*** (3.01)	2.3348*** (6.85)	0.6442*** (3.63)
<i>Financial integration</i>	-0.0047 (-1.30)	-0.0083*** (-5.22)	-0.0060* (-1.65)	-0.0085*** (-5.26)
<i>Economic freedom</i>	-0.4211*** (-7.95)	-0.1618*** (-5.21)	-0.4338*** (-8.19)	-0.1766*** (-6.19)
<i>Market concentration</i>	-2.4716*** (-4.00)	-0.1894 (-0.62)	-2.2025*** (-3.57)	-0.2904 (-0.98)
<i>Earnings management</i>	-3.3525*** (-2.68)	-3.1589*** (-5.68)	-3.9879*** (-3.18)	-3.2388*** (-5.77)
<i>IPO activity</i>	2.1639*** (5.57)	-0.6123*** (-3.12)	2.3355*** (6.01)	-0.5425*** (-2.87)
<i>Market return</i>	0.1524 (1.47)	0.7960*** (17.29)	0.1468 (1.41)	0.8001*** (17.14)
<i>Liquidity</i>	-0.0769*** (-3.49)	-0.1006*** (-9.65)	-0.0698*** (-3.17)	-0.1034*** (-10.04)
<i>Offer size (log)</i>	0.0064 (0.87)	-0.0433*** (-13.29)	0.0067 (0.91)	-0.0430*** (-13.03)
<i>Top underwriter</i>	0.0054 (0.20)	0.0402*** (3.42)	0.0066 (0.25)	0.0403*** (3.36)
<i>VC backed</i>	-0.0520** (-2.01)	0.0288** (2.46)	-0.0514** (-1.99)	0.0268** (2.28)
<i>Lockup length (log)</i>	-0.0170*** (-3.63)	-0.0221*** (-9.90)	-0.0168*** (-3.59)	-0.0227*** (-10.29)
<i>Bookbuilt</i>	-0.0895*** (-3.30)	-0.0644*** (-5.05)	-0.0901*** (-3.32)	-0.0676*** (-5.34)
<i>Firm commitment</i>	0.0032 (0.11)	0.0158 (1.27)	0.0040 (0.14)	0.0162 (1.28)
<i>Carve-out</i>	0.0419 (1.31)	0.0348** (2.45)	0.0378 (1.18)	0.0362** (2.51)
<i>High tech</i>	0.0004 (0.01)	0.0988*** (3.16)	0.0022 (0.03)	0.0988*** (3.11)
Industry fixed effects	Yes	Yes	Yes	Yes
Issue year fixed effects	Yes	Yes	Yes	Yes
Anderson χ^2		73.64		119.149
Hausman <i>F</i> -stat		2.41		8.18
Anderson-Rubin <i>F</i> -stat		6.48		9.18
Cragg-Donald <i>F</i> -stat		36.89		59.87

Stock-Yogo (10%)		19.93		19.93
Observations	15,143	15,143	15,143	15,143
R-squared		0.109		0.078

This table reports the results of a two-stage least squares location fixed effect model that examines the relation between *RSUI* and *underpricing*. *Neighbor unrest*, *neighbor unrest (#)*, and *misery index* are used to instrument for *RSUI*. All variables are defined in the Appendix. The numbers in parentheses below each coefficient are heteroskedasticity-robust *t*-statistics. Respectively, ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent level.

Table 7 – Institutional quality

	Control of corruption	Government effectiveness	Political stability	Regulatory quality	Rule of law	Voice and accountability
<i>RSUI</i>	-0.0345*** (-5.30)	-0.0556*** (-6.10)	-0.0260*** (-5.23)	-0.0454*** (-5.83)	-0.0452*** (-6.07)	-0.0191*** (-4.19)
<i>Indicator</i>	0.0470 (1.50)	0.1688*** (4.57)	-0.0493* (-1.84)	0.1463*** (3.89)	0.0305 (0.80)	-0.0109 (-0.29)
<i>RSUI × Indicator</i>	0.0193*** (5.00)	0.0332*** (6.04)	0.0264*** (5.23)	0.0292*** (5.65)	0.0293*** (5.84)	0.0163*** (3.96)
<i>Democracy</i>	0.0855 (0.75)	0.1759 (1.55)	0.0968 (0.85)	0.1233 (1.13)	-0.0350 (-0.30)	0.1277 (0.98)
<i>Financial integration</i>	-0.0087*** (-6.23)	-0.0118*** (-8.14)	-0.0072*** (-5.25)	-0.0109*** (-7.71)	-0.0090*** (-6.43)	-0.0074*** (-5.32)
<i>Economic freedom</i>	-0.1450*** (-6.43)	-0.1993*** (-8.79)	-0.1287*** (-6.18)	-0.1753*** (-7.61)	-0.1167*** (-5.49)	-0.1149*** (-5.19)
<i>Market concentration</i>	-0.1254 (-0.58)	0.1518 (0.69)	-0.1114 (-0.52)	-0.3807* (-1.78)	-0.0731 (-0.35)	-0.1066 (-0.49)
<i>Earnings management</i>	-3.0287*** (-5.84)	-2.8346*** (-5.45)	-2.9619*** (-5.73)	-2.7509*** (-5.32)	-2.8269*** (-5.43)	-2.9049*** (-5.57)
<i>IPO activity</i>	-0.7149*** (-4.38)	-0.6661*** (-4.09)	-0.7537*** (-4.64)	-0.6086*** (-3.73)	-0.7201*** (-4.41)	-0.7627*** (-4.67)
<i>Market return</i>	0.7768*** (17.28)	0.7715*** (17.23)	0.7875*** (17.53)	0.8020*** (17.90)	0.7896*** (17.60)	0.7908*** (17.60)
<i>Liquidity</i>	-0.0880*** (-9.45)	-0.0984*** (-10.52)	-0.0871*** (-9.34)	-0.0808*** (-8.66)	-0.0854*** (-9.17)	-0.0883*** (-9.42)
<i>Offer size (log)</i>	-0.0436*** (-13.71)	-0.0414*** (-13.04)	-0.0434*** (-13.66)	-0.0436*** (-13.75)	-0.0440*** (-13.87)	-0.0436*** (-13.70)
<i>Top underwriter</i>	0.0394*** (3.41)	0.0386*** (3.35)	0.0386*** (3.34)	0.0403*** (3.50)	0.0391*** (3.38)	0.0391*** (3.38)
<i>VC backed</i>	0.0323*** (2.90)	0.0299*** (2.69)	0.0344*** (3.09)	0.0324*** (2.91)	0.0353*** (3.17)	0.0340*** (3.05)
<i>Lockup length (log)</i>	-0.0206*** (-10.18)	-0.0210*** (-10.43)	-0.0206*** (-10.18)	-0.0210*** (-10.43)	-0.0207*** (-10.28)	-0.0207*** (-10.19)
<i>Bookbuilt</i>	-0.0587*** (-5.09)	-0.0731*** (-6.31)	-0.0609*** (-5.29)	-0.0503*** (-4.36)	-0.0609*** (-5.28)	-0.0565*** (-4.87)
<i>Firm commitment</i>	0.0116 (0.95)	0.0064 (0.52)	0.0112 (0.91)	0.0119 (0.98)	0.0084 (0.68)	0.0142 (1.16)
<i>Carve-out</i>	0.0324** (2.34)	0.0273** (1.98)	0.0315** (2.28)	0.0293** (2.12)	0.0322** (2.33)	0.0319** (2.30)
<i>High tech</i>	0.0987*** (3.21)	0.0928*** (3.03)	0.0980*** (3.19)	0.0977*** (3.18)	0.1004*** (3.27)	0.1001*** (3.25)
<i>Constant</i>	2.0183*** (10.52)	2.4230*** (12.46)	1.8647*** (10.30)	2.2983*** (12.15)	1.9403*** (10.67)	1.7148*** (8.92)
<i>RSUI + Interaction</i>	-0.0151*** (-3.93)	-0.0224*** (-4.91)	0.0004 (0.10)	-0.0163*** (-4.14)	-0.0159*** (-4.15)	-0.0028 (-0.74)
<i>Industry fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes

Issue year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,145	15,145	15,145	15,145	15,145	15,145
Number of locations	36	36	36	36	36	36

This table reports the results of HLM regressions that examine that examine the relation between *RSUI* and *underpricing*. All variables are defined in the Appendix. The numbers between parentheses below each coefficient are the *z*-statistics. Respectively, ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent level.

Table 8 – Limits to arbitrage

	Short selling banned	Security lending banned	Short selling not practiced
<i>RSUI</i>	-0.0039 (-1.10)	-0.0003 (-0.07)	0.0006 (0.14)
<i>Short selling measure</i>	0.2821*** (6.38)	0.4444*** (7.50)	0.0093 (0.10)
<i>RSUI × Short selling measure</i>	-0.0493*** (-4.27)	-0.0485*** (-5.16)	-0.0316*** (-4.21)
<i>Democracy</i>	0.2861** (2.57)	0.1912* (1.71)	0.1521 (1.30)
<i>Financial integration</i>	-0.0088*** (-6.32)	-0.0077*** (-5.60)	-0.0082*** (-5.69)
<i>Economic freedom</i>	-0.0750*** (-3.45)	-0.0862*** (-4.09)	-0.1087*** (-5.11)
<i>Market concentration</i>	-0.0945 (-0.44)	-0.0522 (-0.24)	-0.0812 (-0.37)
<i>Earnings management</i>	-3.3633*** (-6.41)	-3.1549*** (-6.08)	-3.0019*** (-5.71)
<i>IPO activity</i>	-0.7933*** (-4.87)	-0.7606*** (-4.67)	-0.7833*** (-4.81)
<i>Market return</i>	0.7943*** (17.67)	0.7804*** (17.37)	0.7868*** (17.51)
<i>Liquidity</i>	-0.0924*** (-9.89)	-0.0911*** (-9.79)	-0.0899*** (-9.65)
<i>Offer size (log)</i>	-0.0428*** (-13.46)	-0.0438*** (-13.79)	-0.0435*** (-13.68)
<i>Top underwriter</i>	0.0380*** (3.28)	0.0400*** (3.46)	0.0387*** (3.34)
<i>VC backed</i>	0.0326*** (2.92)	0.0328*** (2.94)	0.0340*** (3.05)
<i>Lockup length (log)</i>	-0.0204*** (-10.09)	-0.0204*** (-10.11)	-0.0207*** (-10.22)
<i>Bookbuilt</i>	-0.0596*** (-5.13)	-0.0621*** (-5.36)	-0.0567*** (-4.89)
<i>Firm commitment</i>	0.0133 (1.09)	0.0133 (1.09)	0.0149 (1.22)
<i>Carve-out</i>	0.0297** (2.15)	0.0308** (2.23)	0.0312** (2.25)
<i>High tech</i>	0.0996*** (3.24)	0.1016*** (3.31)	0.0984*** (3.20)
<i>Constant</i>	1.3682*** (7.34)	1.4002*** (7.58)	1.7103*** (7.79)
<i>RSUI + Indicator</i>	-0.0533*** (-4.70)	-0.0487*** (-5.62)	-0.0310*** (-4.84)
Industry fixed effects	Yes	Yes	Yes
Issue year fixed effects	Yes	Yes	Yes

Observations	15,145	15,145	15,145
Number of locations	36	36	36

This table reports the results of HLM regressions that examine the relation between *RSUI* and *underpricing*. All variables are defined in the Appendix. The numbers between parentheses below each coefficient are the *z*-statistics. Respectively, ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent level.

Table 9 – Non-linearity

	Location FE
<i>RSUI</i>	0.0156 (1.54)
<i>RSUI</i> ²	-0.0040*** (-2.58)
<i>Democracy</i>	0.3832*** (2.59)
<i>Financial integration</i>	-0.0079*** (-5.05)
<i>Economic freedom</i>	-0.1323*** (-5.99)
<i>Market concentration</i>	0.0192 (0.07)
<i>Earnings management</i>	-3.0122*** (-5.62)
<i>IPO activity</i>	-0.7795*** (-4.71)
<i>Market return</i>	0.7881*** (17.52)
<i>Liquidity</i>	-0.0936*** (-9.88)
<i>Offer size (log)</i>	-0.0436*** (-13.66)
<i>Top underwriter</i>	0.0395*** (3.41)
<i>VC backed</i>	0.0331*** (2.96)
<i>Lockup length (log)</i>	-0.0208*** (-10.24)
<i>Bookbuilt</i>	-0.0582*** (-4.96)
<i>Firm commitment</i>	0.0152 (1.24)
<i>Carve-out</i>	0.0315** (2.27)
<i>High tech</i>	0.0981*** (3.19)
<i>Constant</i>	1.8641*** (8.28)
Industry fixed effects	Yes
Issue year fixed effects	Yes
Observations	15,145
R-squared	0.137
Number of locations	36

This table reports the results of a location fixed effect model that considers the possibility that the relation between *RSUI* and *underpricing* is nonlinear. All variables are defined in the Appendix. The numbers between parentheses below each coefficient are the z-statistics. Respectively, ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent level.

Table 10 – Alternative return measures

	Two-week return	One-month return	Offer-to-open return	Open-to-close return
<i>RSUI</i>	-0.0132** (-2.26)	-0.0102* (-1.88)	-0.0108*** (-3.40)	-0.0017 (-1.42)
<i>Democracy</i>	1.0875*** (4.44)	1.3940*** (6.15)	0.1666 (1.28)	0.1664*** (3.32)
<i>Financial integration</i>	-0.0185*** (-7.17)	-0.0199*** (-8.34)	-0.0088*** (-6.38)	-0.0004 (-0.84)
<i>Economic freedom</i>	0.1314*** (3.60)	0.2641*** (7.81)	-0.1336*** (-6.57)	0.0322*** (4.15)
<i>Market concentration</i>	-0.8055* (-1.85)	0.1267 (0.31)	0.1806 (0.78)	-0.0053 (-0.06)
<i>Earnings management</i>	-0.0796 (-0.09)	2.7563*** (3.35)	-3.1660*** (-6.21)	0.4120** (2.11)
<i>IPO activity</i>	-1.6355*** (-5.97)	-2.0263*** (-8.00)	-0.5971*** (-3.98)	-0.1837*** (-3.21)
<i>Market return</i>	0.9685*** (13.00)	1.0486*** (15.12)	0.6913*** (17.02)	0.0502*** (3.23)
<i>Liquidity</i>	0.1488*** (9.49)	0.2965*** (19.72)	-0.1148*** (-13.57)	0.0208*** (6.44)
<i>Offer size (log)</i>	-0.0746*** (-14.11)	-0.0777*** (-15.84)	-0.0347*** (-12.13)	-0.0049*** (-4.50)
<i>Top underwriter</i>	0.0724*** (3.77)	0.0853*** (4.78)	0.0371*** (3.60)	0.0014 (0.35)
<i>VC backed</i>	0.0845*** (4.56)	0.1432*** (8.31)	0.0184* (1.86)	0.0050 (1.32)
<i>Lockup length (log)</i>	-0.0226*** (-6.72)	-0.0150*** (-4.82)	-0.0219*** (-12.22)	0.0004 (0.58)
<i>Bookbuilt</i>	0.0187 (0.97)	0.0966*** (5.36)	-0.0664*** (-6.30)	0.0115*** (2.85)
<i>Firm commitment</i>	-0.0253 (-1.25)	-0.0699*** (-3.71)	0.0226** (2.08)	-0.0089** (-2.13)
<i>Carve-out</i>	0.0825*** (3.59)	-0.0155 (-0.73)	0.0129 (1.05)	0.0113** (2.39)
<i>High tech</i>	0.0755 (1.48)	0.0395 (0.84)	0.0817*** (2.99)	0.0013 (0.13)
<i>Constant</i>	0.3859 (1.04)	-0.7936** (-2.30)	1.9912*** (9.74)	-0.2743*** (-3.51)
Industry fixed effects	Yes	Yes	Yes	Yes
Issue year fixed effects	Yes	Yes	Yes	Yes
Observations	15,143	14,953	14,642	14,554
R-squared	0.124	0.203	0.157	0.022
Number of locations	36	36	35	35

This table reports the results of location fixed effect regressions that examine the relation between *RSUI* and *underpricing*. Underpricing is measured with the following four alternative measures: *two-week return*, *one-month return*, *offer-to-open*, and *open-to-close*. All variables are defined in the Appendix. The numbers between parentheses below each coefficient are the z-statistics. Respectively, ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent level.

Table 11 – Exclude influential locations

Excluded locations:	Mainland China	Hong Kong SAR	U.K.	U.S.	Austria	Netherlands	Sweden	Türkiye	Markets with zero unrest events
<i>RSUI</i>	-0.0060* (-1.73)	-0.0062* (-1.70)	-0.0088** (-2.42)	-0.0108*** (-2.82)	-0.0089** (-2.52)	-0.0087** (-2.44)	-0.0093** (-2.57)	-0.0088** (-2.50)	-0.0130*** (-2.69)
<i>Democracy</i>	0.5531*** (3.77)	0.4830*** (3.26)	0.4068*** (2.63)	0.6095*** (3.65)	0.3952*** (2.67)	0.4025*** (2.72)	0.3902*** (2.63)	0.3776** (2.53)	0.9017*** (4.49)
<i>Financial integration</i>	0.0004 (0.21)	-0.0047*** (-2.94)	-0.0080*** (-4.91)	-0.0083*** (-5.25)	-0.0080*** (-5.12)	-0.0080*** (-5.13)	-0.0078*** (-4.96)	-0.0081*** (-5.19)	-0.0253*** (-10.03)
<i>Economic freedom</i>	-0.0088 (-0.34)	-0.1216*** (-5.42)	-0.1263*** (-5.38)	-0.2220*** (-8.22)	-0.1289*** (-5.83)	-0.1283*** (-5.82)	-0.1340*** (-6.01)	-0.1349*** (-5.93)	-0.1806*** (-6.13)
<i>Market concentration</i>	-0.5189* (-1.85)	0.3880 (1.45)	-0.0326 (-0.12)	-0.5295* (-1.93)	0.0309 (0.12)	0.0321 (0.12)	-0.0023 (-0.01)	0.0103 (0.04)	-3.0620*** (-4.22)
<i>Earnings management</i>	0.2405 (0.41)	-2.3221*** (-4.18)	-3.0171*** (-5.31)	-2.6616*** (-4.85)	-2.9740*** (-5.54)	-3.0211*** (-5.63)	-3.0266*** (-5.58)	-2.8793*** (-5.19)	-2.9389*** (-4.95)
<i>IPO activity</i>	0.1720 (0.89)	-0.7532*** (-4.39)	-0.8008*** (-4.59)	-0.5291*** (-3.11)	-0.7665*** (-4.63)	-0.7981*** (-4.82)	-0.8480*** (-5.03)	-0.7858*** (-4.72)	-0.0889 (-0.47)
<i>Market return</i>	0.9739*** (18.27)	0.8385*** (17.87)	0.7858*** (16.72)	0.8141*** (17.46)	0.7874*** (17.49)	0.7832*** (17.41)	0.7892*** (17.38)	0.7937*** (17.54)	0.6324*** (12.36)
<i>Liquidity</i>	0.0177 (1.16)	-0.0834*** (-8.73)	-0.0976*** (-9.77)	-0.1220*** (-11.52)	-0.0953*** (-10.01)	-0.0948*** (-10.00)	-0.0929*** (-9.72)	-0.0943*** (-9.94)	-0.1160*** (-10.21)
<i>Offer size (log)</i>	-0.0427*** (-13.12)	-0.0387*** (-11.72)	-0.0439*** (-12.37)	-0.0494*** (-14.55)	-0.0438*** (-13.70)	-0.0436*** (-13.65)	-0.0444*** (-13.74)	-0.0440*** (-13.73)	-0.0407*** (-10.38)
<i>Top underwriter</i>	0.0622*** (4.81)	0.0408*** (3.38)	0.0374*** (3.04)	0.0045 (0.33)	0.0399*** (3.44)	0.0407*** (3.50)	0.0400*** (3.42)	0.0407*** (3.49)	-0.0196 (-1.34)
<i>VC backed</i>	0.0785*** (6.27)	0.0359*** (3.16)	0.0353*** (2.97)	-0.0290** (-2.07)	0.0332*** (2.96)	0.0329*** (2.94)	0.0326*** (2.90)	0.0331*** (2.95)	-0.0382** (-2.52)
<i>Lockup length (log)</i>	-0.0136*** (-6.38)	-0.0241*** (-11.17)	-0.0222*** (-9.91)	-0.0180*** (-8.30)	-0.0208*** (-10.25)	-0.0207*** (-10.19)	-0.0213*** (-10.38)	-0.0208*** (-10.25)	-0.0221*** (-8.94)
<i>Bookbuilt</i>	0.0152 (1.25)	-0.0757*** (-6.00)	-0.0581*** (-4.32)	-0.0273** (-2.29)	-0.0573*** (-4.88)	-0.0580*** (-4.94)	-0.0544*** (-4.56)	-0.0554*** (-4.67)	-0.0554*** (-4.18)
<i>Firm commitment</i>	-0.0157 (-1.28)	0.0079 (0.63)	0.0179 (1.31)	0.0355*** (2.64)	0.0152 (1.23)	0.0144 (1.17)	0.0139 (1.12)	0.0145 (1.18)	0.0323* (1.85)
<i>Carve-out</i>	0.0358** (2.39)	0.0217 (1.45)	0.0300** (2.02)	0.0334** (2.18)	0.0317** (2.29)	0.0320** (2.30)	0.0292** (2.08)	0.0315** (2.26)	0.0574*** (3.48)

<i>High tech</i>	0.1266*** (3.75)	0.0978*** (3.03)	0.1006*** (3.04)	0.0718** (2.26)	0.0982*** (3.18)	0.0984*** (3.20)	0.0997*** (3.20)	0.0976*** (3.15)	0.0510 (1.43)
<i>Constant</i>	0.0572 (0.20)	1.4979*** (6.55)	1.8660*** (7.78)	2.6041*** (10.72)	1.8699*** (8.30)	1.8519*** (8.24)	1.9081*** (8.41)	1.9401*** (8.41)	3.5367*** (11.13)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Issue year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,788	13,873	13,796	12,493	15,121	15,091	14,967	15,060	8,621
R-squared	0.095	0.149	0.141	0.144	0.137	0.138	0.139	0.138	0.205
Number of locations	35	35	35	35	35	35	35	35	27

This table reports the results of location fixed effect regressions that examine the relation between *RSUI* and *underpricing*. Each column excludes IPOs issued in the market or markets listed in the column heading. All variables are defined in the Appendix. The numbers between parentheses below each coefficient are the z-statistics. Respectively, ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent level.