



Economic policy uncertainty and covenants in venture capital contracts

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ABSTRACT

This study investigates how economic policy uncertainty (EPU) affects venture capital (VC) contract terms. Using a unique database of contracts between VCs and entrepreneurial firms in China, we provide evidence that EPU positively affects the presence of investor-friendly covenants in VC contracts. Our mechanism analysis shows that screening for high-quality startups and VCs' increased bargaining power are potential channels. Furthermore, we find that including more investor-friendly covenants mitigates the negative effect of EPU on VC exit performance.

1. Introduction

Venture capital (VC) is a significant driver of entrepreneurship, innovation, and economic growth (Kortum and Lerner, 2001; Gompers and Lerner, 2004). When financing entrepreneurial firms, VCs are faced with substantial information asymmetries and agency problems (Jensen and Meckling, 1976; Holmström, 1979). Financial contracts help address these problems through contingent allocations of cash flow and control rights between entrepreneurs and investors (Aghion and Bolton, 1992; Dewatripont and Tirole, 1994). The design of these contracts holds significant importance, as they profoundly influence the performance of startups (Ewens et al., 2022), VCs' exit choices (Cumming, 2008), and determine the distribution of ultimate payoffs between VCs and entrepreneurs (Broughman and Fried, 2010). Consequently, identifying the factors that influence the structure of VC contracts represents a critical research question with both academic and practical implications.

However, empirical research on this topic remains scarce because of the opacity of VC industry and practitioners' limited data sharing (Burchardt et al., 2016). This has left significant gaps in our understanding, particularly regarding how governments and policies influence VC contract design. In recent years, economic policy uncertainty

(EPU) has emerged as a prominent factor affecting economic outcomes worldwide, driven by increasing events associated with political and economic instability (Baker et al., 2016). This study seeks to address this research gap by examining how EPU shapes the contractual terms between VCs and entrepreneurs.

We propose two competing hypotheses regarding the impact of EPU on VC contracting. The first hypothesis posits that VCs include more investor-friendly covenants during high-EPU periods. The theoretical rationale for this proposition is threefold. First, given the increased difficulty in distinguishing high-quality startups from low-quality ones during high-EPU periods, VCs may use investor-friendly covenants as a screening mechanism. Second, VCs are more likely to seek downside protection in response to the heightened risk associated with EPU. Third, regarding contract negotiation, VCs' bargaining power may strengthen when EPU's negative impact on VC supply outweighs its negative impact on VC demand.

Conversely, our second hypothesis contends that VCs include fewer investor-friendly covenants during high-EPU periods. This alternative view is supported by two considerations. From a motivation perspective, VCs may avoid stringent contractual terms to alleviate potential moral hazard problems or to foster a more conducive environment for subsequent financing rounds. From a bargaining power standpoint, VCs'

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negotiating position may weaken when EPU's adverse effect on VC demand exceeds its impact on VC supply. Hence, the net effect of EPU on the utilization of investor-friendly covenants in VC contracts remains an empirical question requiring further investigation.

To empirically examine our hypotheses, we construct a novel dataset comprising 825 VC contracts collected from 14 Chinese VC firms between 2011 and 2020. Our sample substantially exceeds that in the seminal paper of Kaplan and Strömberg (2003), which similarly employ contract data collected directly from VC firms. We identify eight principal covenants in the contracts—information rights, non-compete clauses, redemption rights, drag-along rights, tag-along rights, liquidation preferences, anti-dilution rights, and preemptive rights—all of which are also prevalently used in VC investments in developed markets (Kaplan and Strömberg, 2003, 2004; Cumming, 2008; Bengtsson and Sensoy, 2011, 2015). Based on the level of protection provided to investors and whether the covenant affects the allocation of cash flow, we categorize these covenants into two groups: protection covenants and default covenants.¹ This comprehensive dataset enables precise examination of the relationship between EPU and VC contract terms. We employ China's provincial EPU index constructed by this study and official turnovers to capture the EPU faced by VCs and startups.

China represents an ideal setting for this investigation for two key reasons. First, China's VC market has emerged as a globally significant player, ranking as the world's second-largest VC market with \$113.8 billion VC investment in 2021.² Moreover, China is one of the most preferred investment destinations for international VCs (Guo and Jiang, 2013), with foreign investors participating in 18.6 % of VC deals completed in 2021.³ Second, insights from China's VC market hold particular relevance for other emerging economies. China's VC market has thrived under conditions of institutional imperfections, financial constraints, and rapid economic transformation (Allen et al., 2005), conditions shared by many developing countries. Consequently, findings from China's VC experience may offer valuable implications for other emerging markets facing similar challenges.

Our empirical results demonstrate that elevated EPU leads to the inclusion of more investor-friendly covenants in VC contracts, encompassing both default covenants and protection covenants. The relationship between EPU and VC contract terms remains robust across multiple checks, including subsample analysis, alternative estimation method, alternative measures of EPU, and placebo tests.

To address endogeneity concerns, we employ an instrumental variable approach. For the provincial EPU index, we utilize the intensity of the anti-corruption campaign in the province as an instrumental variable. This choice is justified by prior research (Chen et al., 2018; Kim et al., 2018), showing that anti-corruption leads to turnovers of policy-makers and consequently increases policy uncertainty. Meanwhile, the anti-corruption campaign is unlikely to affect VC contract terms through channels other than EPU. For official turnovers, we use provincial officials' connections with top leaders as an instrumental variable following Xu et al. (2016). Existing literature has established that such connections with their superiors facilitate promotions through shared identity and the trust from superior leaders (Shih et al., 2012; Oppen et al., 2015). Furthermore, provincial officials' tie with top leaders is not directly related to VC contract designs. The results of the instrumental variable approach indicate a likely causal link between EPU and VC contract designs.

Next, we investigate two potential channels through which EPU affects VC contract design: the screening channel and the bargaining power channel. First, we assess whether VCs include more investor-

friendly covenants in the contracts to screen for high-quality startups. If this is the case, VCs may pursue more contractual protection when the information asymmetry between VCs and entrepreneurs is higher. We posit that the information asymmetry is more pronounced in newly-established businesses and in industries characterized by high information asymmetry. Consistent with the above prediction, our findings show that the effect of EPU on VC contract structure is amplified for investments in younger entrepreneurial firms and in industries with lower analyst coverage.

Second, we examine whether VCs obtain more favorable contract terms due to enhanced bargaining power during periods of elevated EPU. Cumming and Dai (2011) show that VC fund size and VC reputation positively influence VCs' bargaining power. Our findings reveal that the positive impact of EPU on contract terms is more pronounced for VCs with larger fund sizes and higher reputations. This evidence suggests that elevated EPU strengthens VCs' bargaining power, enabling them to negotiate more advantageous contractual terms.

Finally, we explore the economic consequences of incorporating more investor-friendly covenants in the contracts by analyzing the joint impact of EPU and contract terms on VC exits. Our results demonstrate that EPU negatively impacts the likelihood of a successful exit, yet this adverse effect is mitigated when investment contracts incorporate more investor-friendly covenants.

Our article contributes to the literature in the following ways. First, we extend the research on the determinants of VC contracts by providing novel insights into how external risk factors shape VC contract design. Prior studies have shown that various factors, including VC characteristics (Bengtsson and Sensoy, 2011; Bengtsson and Bernhardt, 2014), entrepreneurial firm characteristics (Bengtsson and Ravid, 2009; Bengtsson and Sensoy, 2015; Nahata, 2019), legal conditions (Lerner and Schoar, 2005; Kaplan et al., 2007; Cumming and Johan, 2008), and various sources of risks (Kaplan and Strömberg, 2004), shape VC contract structures. Complementing and extending Kaplan and Strömberg (2004), our paper demonstrates that EPU, as a form of external risk, has significant implications for covenants in VC contracts. Our key contribution involves employing more precise measures of external risk to examine its effects on VC contracts and elucidating the underlying channels through which these effects operate.⁴

Second, we advance the literature on the impact of EPU on VC activities. Existing research has primarily focused on VC investment decisions. For instance, Tian et al. (2023) document that heightened policy uncertainty results in reduced VC investment propensity. Similarly, Huang et al. (2022) find that VCs tend to delay refinancing their portfolio companies amid elevated EPU. In contrast, we investigate how VCs adapt contract designs to mitigate EPU during investment process. To the best of our knowledge, this paper offers the first empirical evidence on the influence of EPU on VC contract design.

The rest of the paper is organized as follows. Section 2 develops the main hypotheses. Section 3 describes the sample and presents summary statistics. Section 4 reports the baseline results and addresses endogeneity issues. Section 5 investigates the mechanisms through which EPU affects VC contracts. Section 6 explores the outcomes associated with investor-friendly covenants. Section 7 concludes the paper.

2. Literature review and hypothesis

2.1. Literature review on VC contracts

A large body of theoretical literature has investigated the features of contracts between VCs and entrepreneurs, as the VC setup closely approximates the principal-agent relationship in financial contract theory

¹ Information rights and non-compete clauses are classified as default covenants, whereas the remaining covenants are categorized as protection covenants.

² PitchBook is a leading data provider focusing on private capital markets.

³ The figure also comes from PitchBook.

⁴ Kaplan and Strömberg (2004) construct the risk measures based on descriptions in the investment memoranda. They acknowledge that these measures are subject to different interpretations and may not be precise.

(Kaplan and Strömberg, 2003). These studies have established that the allocation of cash flow and control rights between contracting parties, especially the use of convertible preferred equity, plays a crucial role in mitigating agency problems in VC investment (e.g., Bergemann and Hege, 1998; Hellmann, 1998; Schmidt, 2003; Dessein, 2005).

Although not as fruitful as theoretical studies, empirical studies in this field have made large strides into demonstrating how VC contracts are structured in practice. In a seminal paper, Kaplan and Strömberg (2003) analyze actual VC contracts of 213 investments in the U.S. to compare the characteristics of real-world financial contracts to their counterparts in financial contracting theory. They find that these contracts allow VCs to separately allocate cash flow rights, board rights, voting rights, liquidation rights, and other control rights. A number of papers also consider the factors that affect VC contract designs, encompassing VC characteristics, entrepreneurial firm characteristics, legal conditions, and various sources of risks. With respect to VC characteristics, Bengtsson and Sensoy (2011) demonstrate that more experienced VCs obtain weaker downside-protecting contractual rights than less experienced VCs. Bengtsson and Bernhardt (2014) show that VCs tend to specialize in certain contract solutions. Regarding entrepreneurial firm characteristics, previous studies have established that the location of startups (Bengtsson and Ravid, 2009), entrepreneurial firms' performance (Bengtsson and Sensoy, 2015), and entrepreneurs' prior entrepreneurship (Nahata, 2019) are all key factors that affect the structure of VC contracts. Legal conditions, such as legal origin and legal enforcement, also have a significant impact on VC contract designs (Lerner and Schoar, 2005; Kaplan et al., 2007; Cumming and Johan, 2008). Moreover, Kaplan and Strömberg (2004) find that different sources of risks, including internal risk, external risk, and execution risk, are associated with the use of different contractual terms.

However, the relationship between government policies and VC contract designs remains poorly understood. Therefore, our study addresses this gap by investigating how EPU shapes the structure of VC contracts.

2.2. Literature review on the effects of EPU

EPU, which has recently received increased attention from scholars, plays a critical role in shaping economic activities. The impact of EPU on the economy has been studied mainly from four perspectives: economic outcomes, asset prices, corporate decisions, and financial intermediaries.

Firstly, previous literature has pointed out that EPU adversely affects economic outcomes, including lowering real investments (Bernanke, 1983; Bloom, 2009), decreasing economic growth (Bloom, 2009; Colombo, 2013), and increasing unemployment rate (Caggiano et al., 2017; Fontaine et al., 2018).

Secondly, another branch of the literature links EPU to asset prices. Empirical evidence has validated that EPU not only induces a significant risk premium in equity markets (Pástor and Veronesi, 2013), but also predicts future returns (Brogaard and Detzel, 2015; Chiang, 2021) and intensifies stock volatility (Boutchkova et al., 2012). On top of that, EPU exerts an influence on options market (Kelly et al., 2016) and bond market (Kaviani et al., 2020) as well.

Thirdly, extensive research has examined the impact of EPU on corporate activities. During periods of heightened EPU, firms typically face significant constraints in accessing external financing channels, including both equity market (Çolak et al., 2017) and debt market (Waisman et al., 2015). Moreover, EPU has been shown to suppress firms' capital investments (Julio and Yook, 2012; Gulen and Ion, 2016) and M&A activities (Nguyen and Phan, 2017; Bonaime et al., 2018). In addition, prior research has reported the effects of EPU on other corporate activities, such as cash holdings (Duong et al., 2020), dividend payout (Attig et al., 2021), and innovation (Bhattacharya et al., 2017).

Finally, financial intermediaries, including banks and VC firms, are also significantly affected by EPU. Previous studies mainly focus on the

effect of EPU on banks, which suggests that EPU is negatively associated with bank credit growth (Bordo et al., 2016), while positively associated with bank liquidity hoarding (Berger et al., 2022) and bank cross-border lending (Biswas and Zhai, 2021).

Our paper relates to the literature examining the effect of EPU on VC firms. Prior studies show that VCs are reluctant to finance startups or refinance their portfolio companies when EPU increases (Huang et al., 2022; Tian et al., 2023). Moreover, EPU negatively impacts VCs' investment outcomes. Specifically, Tian et al. (2023) verify that, in the U.S. VC market, a higher level of EPU during a startup's incubation period is negatively related to the VC's probability of a successful exit. Huang et al. (2022) provide similar evidence using samples collected from China's VC market. These studies indicate that VCs' investment risk is substantially heightened during high-EPU periods, as manifested by significantly higher investment failure rate.

2.3. Hypothesis development

We consider the impact of EPU on the adoption of investor-friendly covenants from two perspectives: (1) the motivation for setting these covenants and (2) the ability to obtain them in the contract negotiation.

Due to the transaction costs and monitoring costs associated with setting specific terms (Holmström, 1979), VCs include investor-friendly covenants in the contracts based on certain motivations. EPU may influence these motivations in two opposing directions. On the one hand, elevated EPU may strengthen VCs' propensity to set investor-friendly covenants. First, VCs may rely on investor-friendly covenants to screen for good startups, as high EPU makes it harder to distinguish high-quality startups from low-quality ones. Existing literature shows that EPU negatively affects economic outcomes (Bloom, 2009; Colombo, 2013), leading to weaker financial performance for both high- and low-quality firms. Such performance declines blur the distinction between firms hindered by adverse economic conditions and those suffering from internal weaknesses. In response, VCs may strategically adopt investor-friendly covenants to screen for high-quality firms, as the cost of compliance will disproportionately burden weaker firms (Ross, 1977; Diamond, 1991). For instance, covenants such as redemption and liquidation preferences impose greater financial constraints on low-quality firms, thus the acceptance of such covenants could be a credible signal of firm resilience.

Second, investor-friendly covenants, such as liquidation preferences and anti-dilution rights, serve to protect VCs' interests when portfolio company performance deteriorates. Confronted with heightened risk stemming from elevated EPU, VCs may adopt these covenants as a form of downside protection.

On the other hand, EPU may also discourage VCs from using investor-friendly covenants. First, stringent contractual terms for entrepreneurs could intensify moral hazard problems. It has been evidenced that startups have a lower survival rate under high levels of EPU (Huang et al., 2022; Tian et al., 2023). In this case, when bound by stringent terms, such as redemption rights, entrepreneurs may take greater risks to fulfill investors' projections. Entrepreneurs' excessive risk-taking behaviors will improve the upside payoffs, while transferring downside losses to VCs, thereby eroding VCs' benefits. To prevent this distorted payoff distribution, VCs may opt for fewer investor-friendly covenants in the contracts during high-EPU periods.

Second, investor-favorable covenants may hinder future financing. Easier access to finance becomes particularly important when high EPU exacerbates financing constraints on firms (Waisman et al., 2015; Çolak et al., 2017). Potential investors may perceive existing investor-favorable terms granted to previous investors as subordinating their claims, and thus are less inclined to make investments in subsequent financing rounds. Given the staged nature of VC financing (Tian, 2011), VCs could optimize their long-term returns by strategically reducing the usage of investor-friendly covenants during high-EPU periods.

In addition to considering VCs' incentives to adopt investor-friendly covenants, we also examine their ability to secure these terms during negotiation, a process that is largely affected by the relative bargaining power of VCs and entrepreneurs (Bowden, 1994; Ewens et al., 2022). Supply and demand dynamics in the VC market critically determine VCs' bargaining power. When fewer VCs are available to entrepreneurs, bargaining power shifts towards the investors. EPU exerts an influence on both the supply and demand of VC. The supply-side effect is manifested as reduced inflow of new capital into VC funds during high-EPU periods, as investors tend to be more cautious to make investments (Bernanke, 1983). In contrast, the demand-side effect arises as economic uncertainty often suppresses entrepreneurial activities (Bylund and McCaffrey, 2017). Therefore, how EPU affects VCs' bargaining power is ex ante unclear.

Combining the insights mentioned above, we propose the following two competing hypotheses:

H1a. VCs include more investor-friendly covenants in the contracts when EPU is higher.

H1b. VCs include fewer investor-friendly covenants in the contracts when EPU is higher.

3. Data and summary statistics

3.1. Sample

3.1.1. Data collection

VC contracts in our sample are collected from active VC firms in the Chinese VC market. The sampling is conducted as follows. We started with creating a list of Chinese VC firms as our target contacts. We collected data on VC investment in China from CVSource, a professional database focusing on Chinese private equity market. Based on the data, we obtained an initial list of VC firms. Then we selected VC firms that met the following two requirements: (1) having completed at least one investment between 2011 and 2020;⁵ (2) being registered with Asset Management Association of China (AMAC) by the time of data collection.⁶ We categorized these VC firms into six groups based on their capital under management, from smallest to largest.⁷ To ensure the efficiency of data collection, in each category, we randomly selected 10 % of the VC firms from the top 50 % in terms of the number of completed investments as candidates. After that, we obtained a list of 247 VC firms for subsequent outreach. We contacted these VC firms and inquired whether they could provide contracts for investment deals from 2011 to 2020, assuring them of strict confidentiality regarding the collected information. VC firms were requested to provide contracts for all deals they participated in during the sample period, while allowing flexibility for partial submission based on their discretion. Ultimately, we obtained investment contracts from 14 VC firms. We analyze the distribution of these VC firms across multiple dimensions and conduct a comparative analysis with the distribution patterns of all VC firms that meet the two aforementioned criteria. The results are presented in Table 1.

Panel A of Table 1 shows the distribution of VCs' capital under management. Half of the VC firms in our sample manage total funds of less than 0.5 billion RMB. As the scale of capital under management increases, the proportion of VCs decreases. It is important to note that

⁵ We choose this sample period because it represents the fastest-growing decade for Chinese VC market, while also allowing time to observe the startups' exit outcomes.

⁶ Chinese VC firms have been required by the regulatory authority to register with AMAC since 2014.

⁷ According to the classification standard of AMAC, VCs' capital under management is divided into six categories: 0-0.5 billion RMB, 0.5-1 billion RMB, 1-2 billion RMB, 2-5 billion RMB, 5-10 billion RMB, and greater than 10 billion RMB.

Table 1

Summary information for VC firms.

Panel A. Capital under management (billions of RMB)							
	0-0.5	0.5-1	1-2	2-5	5-10	>10	Total
Freq. (Our sample)	7	1	2	1	1	2	14
Percent (Our sample)	50.00	7.14	14.29	7.14	7.14	14.29	100
Freq. (All VCs)	3017	553	456	380	159	165	4730
Percent (All VCs)	63.78	11.69	9.64	8.03	3.36	3.49	100
Panel B. VC Type							
		PVC			GVC		Total
Freq. (Our sample)		9			5		14
Percent (Our sample)		64.29			35.71		100
Freq. (All VCs)		4128			602		4730
Percent (All VCs)		87.27			12.73		100
		Mean	Std. Dev.	Min	Median	Max	N
Panel C. Number of management funds since inception							
Our sample		13.07	19.61	1	5	74	14
All VCs		8.18	17.24	1	4	436	4730
Panel D. Number of invested firms since inception							
Our sample		85.21	146.33	3	22.5	498	14
All VCs		14.49	33.00	1	6.0	1167	4730
Panel E. Number of IPOs							
Our sample		6.21	9.44	0	2.5	31	14
All VCs		0.82	2.81	0	0	131	4730

This table presents the summary information for VC firms. The distribution of capital under management, ownership type, number of management funds, number of invested firms, and number of IPOs for VC firms in our sample is reported. The distribution of these characteristics for all VC firms in China is also presented. VC firms included in the "All VCs" category must have completed at least one VC investment during 2011 to 2020 and be registered with Asset Management Association of China. All figures are based on the statistics from December 2023.

due to our limited sample size, even minor changes in numbers can lead to noticeable changes in proportions. While some discrepancies exist between our sample and the overall industry in terms of size distribution, we believe that our sample remains a qualified representative of the overall industry regarding capital under management. Panel B reports the proportion of different types of VCs, suggesting a higher proportion of government venture capital (GVC) in our sample compared to the overall industry. Panel C shows the distribution of the number of funds managed by VCs. The median number of funds managed by VCs in our sample is 5, which is close to the corresponding number for all VCs. Panel D presents the distribution of the number of VCs' portfolio companies. The median number of portfolio companies of VCs in our sample is 22.5, much higher than the corresponding number for all VCs. Panel E displays the distribution of the number of IPOs achieved by VCs, with a median number of 2.5 in our sample, significantly outperforming VCs in the overall industry.

VC contracts in our sample usually present the basic information of each contracting party, the investment amount of each investor, the ownership structure of the startup, and the privileges and obligations of each party. Importantly, to protect business secrets, the real name of every entity involved in the investments is deleted from the contracts. Therefore, we cannot match our data with other publicly available databases to obtain extra information about the VCs and entrepreneurial firms. Nevertheless, these contracts, which precisely document the negotiated terms between VCs and entrepreneurial firms, constitute a valid empirical foundation for examining our hypotheses.

We have collected the following information from the contracts: the signing date, the investment amount of each investor, the percentage of shares owned by each shareholder, the main business of the

entrepreneurial firm, the address of each contracting party, and, most importantly, the detailed covenants. The main business description is used to identify the entrepreneurial firm's industry. The industries are defined based on the one-digit industry code in the 2012 Industry Classification Code of China Securities Regulatory Commission (CSRC). Given the substantial number of manufacturing firms, we further categorize them into five groups based on the two-digit industry code.⁸ We compute the startup's post-money valuation based on investor's funding amount and acquired equity shares. Additionally, we have acquired supplementary information on VC deals from VC firms that have responded to our inquiries, including the startup's founding date, information on its financing rounds, and its exit status at the time of data collection. From the aforementioned information, we construct the variables necessary for our empirical research.

We proceed to implement the following filtering criteria on the collected sample. First, for contracts involving syndicated investments, we retain only those where the focal VC assumes the role of lead investor. The lead VC is defined as the investor contributing the largest capital amount in a given financing round (Bengtsson and Sensoy, 2011). Second, we exclude observations with missing values in essential variables. Finally, we obtain 825 observations, which represent 825 rounds of investment associated with 818 entrepreneurial firms. Our sample is larger than that of the two influential studies on VC contracts, Kaplan and Strömberg (2003) and Cumming (2008), who also collected contract data directly from different VC firms.⁹ We summarize the characteristics of VC deals in our sample and compare them with those of VC deals recorded in the CVSource database during the sample period. The results are presented in Table 2.

Panel A of Table 2 displays the industry distribution of startups in each VC deal. The startups in our sample are concentrated in the Manufacturing and IT industries, consistent with the pattern of the whole VC industry. Panel B reveals the geographical distribution of the startups. Jiangsu accounts for the highest proportion at 29.6 %, followed by Beijing (15.5 %), Shanghai (12.2 %), Guangdong (7.9 %), and Zhejiang (7.3 %). Relative to the VC industry as a whole, firms in Beijing are slightly underrepresented while firms in Jiangsu are somewhat overrepresented. Panel C shows the yearly distribution of VC deals. The sample is more representative of the recent years: 26.1 % of the financing rounds are completed in 2020, 17.8 % in 2019, 13.4 % in 2018, 19.0 % in 2017, 10.4 % in 2016, and only 13.2 % before 2016. Panel D shows that VCs commit a median of 49 million RMB in each financing rounds of our sample, which is comparable to the financing amount of the overall deals. Panel E reports the valuation of startups in each VC deal. The median valuation of the startup in our sample is 565 million RMB, which closely matches that of the overall startups.

We finalize the data collection process by incorporating macroeconomic conditions prevailing at the time of each investment. These macroeconomic data are collected from CSMAR database, a leading financial data vendor in China.

3.1.2. Sample selection issues

In this section, we discuss potential selection issues concerning our sample and explain how we address these issues.

⁸ We thank an anonymous reviewer for pointing out that using the one-digit industry code is too coarse for the Manufacturing industry. The five categories, classified based on technology intensity, include Low-technology (e.g., textiles, food processing, and paper products), Medium-low-technology (e.g., non-metallic mineral products and general-purpose equipment), Medium-technology (e.g., electrical machinery and apparatus manufacturing), Medium-high-technology (e.g., computer, communication, and electronic equipment manufacturing), and High-technology (e.g., pharmaceuticals).

⁹ Kaplan and Strömberg (2003) analyze 213 VC investments in 119 portfolio companies by 14 VC partnerships. The data used by Cumming (2008) comprise 223 entrepreneurial firms financed by 35 VC funds.

Our sample consists only of VC firms that responded to our request for real investment contracts. Systematic differences may exist between responding and non-responding VCs. Our comparative analysis reveals that VCs in our sample have greater experience and success metrics than industry averages, particularly in terms of more investment deals and superior exit performance. Consequently, our findings may be most applicable to more accomplished VCs and their portfolio companies.

Another potential source of selection bias arises from the fact that some VC firms did not provide all of their investment contracts. For instance, due to challenges in retrieving historical records, certain firms tended to submit contracts primarily from more recent years. This pattern is also evident in Table 2, where the proportion of VC deals in our sample from 2020 exceeds that of the broader industry. To mitigate oversampling of recent deals, we incorporate industry $\times$ year fixed effects into our regression model. Additionally, our sample may overrepresent startups from Jiangsu while underrepresenting those from Beijing. However, our provincial EPU index reveals no systematic differences in EPU between these two regions. Furthermore, we control for unobserved institutional variations across provinces by including province fixed effects in our analysis.

3.2. Covenants

In our sample, we identify eight distinct contractual covenants: information rights, non-compete clauses, redemption rights, drag-along rights, tag-along rights, liquidation preferences, anti-dilution rights, and preemptive rights. Definitions of these covenants can be found in Table 3. Overall, these covenants are predominantly investor-friendly, serving to protect the interest of VCs. Notably, they are closely in line with covenants documented in prior studies based on developed countries (Kaplan and Strömberg, 2003, 2004; Cumming, 2008; Bengtsson and Sensoy, 2011, 2015), indicating their essential roles in mitigating agency problems in VC investments.

For each covenant, we construct a dummy variable, which equals one if the covenant is present in the contract, and zero otherwise. Panel A of Table 4 presents the descriptive statistics of these dummy variables. The most prevalent covenants in the contracts are information rights (90.3 % of the contracts), followed by anti-dilution rights, redemption rights, tag-along rights, preemptive rights, non-compete clauses, liquidation preferences, and drag-along rights.

We categorize these covenants into two distinct groups based on their restrictiveness. The first group, which we term protection covenants following the convention used by Bengtsson and Sensoy (2011), comprises redemption rights, drag-along rights, tag-along rights, liquidation preferences, anti-dilution rights, and preemptive rights. These covenants primarily safeguard VCs during unfavorable scenarios. For instance, redemption rights allow VCs to put their shares back in the company at a stated future date for a stated price, providing a channel to liquidate their investments when the company shows poor performance.

The second group consists of information rights and non-compete clauses. While these terms help address information asymmetry and hold-up problems, they offer relatively weaker protection to investors since they have no influence on the allocation of cash flows in adverse situations. Following Caselli et al. (2013), we refer to the second group as default covenants, since they appear in the majority of contracts in our sample. Overall, the key distinction between these two kinds of covenants lies in their degree of investor protection and impacts on cash flow allocations.

Consistent with Drucker and Puri (2009) and Cumming (2008), we construct three comprehensive covenant indices to measure contract restrictiveness. First, we aggregate the eight covenants into an index, COV, which equals the sum of eight dummy variables for covenants. Next, we construct an index for each covenant group by summing their respective dummy variables: DEFAULT_COV and PROTECTION_COV. According to Panel A of Table 4, the average value of COV, DEFAULT_COV and PROTECTION_COV is 6.4, 1.7 and 4.6, respectively.

Table 2
Summary information for VC deals.

Panel A. CSRC Industry													
	Manufacturing		Information transmission, software, and information technology services			Scientific research and technical service		Wholesale and retail		Leasing and commercial service		Other	Total
Freq. (Our sample)	393		229			25		18		15		145	825
Percent (Our sample)	47.64		27.76			3.03		2.18		1.82		17.58	100
Freq. (All deals)	15,218		14,760			4911		3549		3281		12,229	53,948
Percent (All deals)	28.21		27.36			9.10		6.58		6.08		22.67	100
Panel B. Startup location													
	Beijing		Shanghai			Guangdong		Jiangsu		Zhejiang		Other	Total
Freq. (Our sample)	128		101			65		244		60		227	825
Percent (Our sample)	15.52		12.24			7.88		29.58		7.27		27.52	100
Freq. (All deals)	14,372		9076			8834		5309		5161		11,196	53,948
Percent (All deals)	26.64		16.82			16.38		9.84		9.57		20.75	100
Panel C. Year of deal													
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total		
Freq. (Our sample)	13	9	5	27	55	86	157	111	147	215	825		
Percent (Our sample)	1.58	1.09	0.61	3.27	6.67	10.42	19.03	13.45	17.82	26.06	100		
Freq. (All deals)	2263	1968	1992	3938	8211	9274	7911	7936	5094	5361	53,948		
Percent (All deals)	4.19	3.65	3.69	7.3	15.22	17.19	14.66	14.71	9.44	9.94	100		
	Mean		Std. Dev.			Min		Median		Max		N	
Panel D. Transaction amount (millions of RMB)													
Our sample	168.07		718.33			1.00		49.00		15,648.96		825	
All deals	208.84		1714.37			0.06		34.10		107,094.00		18,414	
Panel E. Valuation (millions of RMB)													
Our sample	1733.52		4942.59			3.40		564.97		82,358.40		825	
All deals	2317.55		18,715.64			0.50		435.04		960,388.00		6676	

This table presents the summary information for VC deals. The distribution of the industry to which the firm belongs, the firm's location, investment year, transaction amount, and valuation for VC deals in our sample is reported. The distribution of these characteristics for all VC deals completed during 2011 to 2020 in China is also presented.

Table 3
Definitions of covenants.

Covenants	Definitions
Information rights	Rights of investors to access the firm's financial report, business plan, and other materials related to the firm's operation
Non-compete clauses	Clauses that prohibit key employees of the firm from working for other firms in the same industry for a period if they leave the firm
Redemption rights	Rights of investors to force the company to purchase shares (a "put"). A redemption right allows an investor to liquidate the investment in the event an IPO or a public merger becomes unlikely.
Drag-along rights	Rights pursuant to which minority shareholders are required to sell their securities in connection with a sale by the majority shareholders
Tag-along rights	Rights of investors to include their minority stock in any sale of stock by majority shareholders
Liquidation preferences	Rights that enable investors to get the payout first in case of a corporate liquidation
Anti-dilution rights	Rights that entitle the investor additional shares if the company raises a new financing round at a lower valuation than what the investor paid (down round)
Preemptive rights	Rights of an investor to participate in a financing round to maintain their percentage of ownership

This table presents the definition of eight principal covenants identified in VC contracts of our sample.

3.3. Measuring EPU

The majority of EPU-related studies employ national measures of EPU to assess its economic outcomes (e.g., [Baker et al., 2016](#)). However, using national EPU measures in this study has two limitations. Firstly, national measures fail to capture the possible cross-provincial variation of EPU faced by VCs and entrepreneurial firms. We take the regional heterogeneity in policy uncertainty into consideration for two reasons. On the one hand, the uncertainty of local government policies also matters for firms and households. [Qian and Xu \(1993\)](#) describe China as

a decentralized economic system where local governments have substantial autonomy in economic policymaking. Many key policies, such as land-use policies, minimum wages, and environmental regulations, are often determined by local governments. As argued by [Baker et al. \(2022\)](#), the authority to enact and modify policies introduces economic uncertainty that significantly affects corporate activities and household decision-making. On the other hand, the exposure to national policies varies across provinces. Due to differences in resource endowment, population characteristics, and economic achievements, provinces are differentially exposed to shocks associated with the national policy. For instance, poverty alleviation policies may profoundly influence underdeveloped provinces while leaving more affluent provinces relatively unaffected. Hence, a finer-grained EPU measure, one that is able to capture interprovincial variation, is essential for our analysis.

The second limitation of national EPU measures concerns their incompatibility with time fixed effects in empirical specifications. When using China's monthly EPU index as the key explanatory variable, the inclusion of time fixed effects would mechanically subsume all the explanatory power of the EPU variable ([Gulen and Ion, 2016](#)). Given that time fixed effects play a crucial role in addressing endogeneity, by ruling out time-variant changes in the macroeconomy and the VC industry, the utilization of national EPU measures may not be suitable for the purpose of this study.

To overcome these limitations, we adopt two province-level EPU measures: China's provincial EPU index and turnover of provincial officials. These two measures exhibit complementary strengths. While provincial EPU index captures a broader range of policy uncertainty, it may conflate policy uncertainty with general macroeconomy volatility. On the contrary, official turnovers focus on policy uncertainty induced by political leadership and are less affected by macroeconomic conditions. Therefore, the combination of these two measures enhances the robustness of our empirical analysis.

Table 4
Summary statistics.

VARIABLES	N	Mean	Std. Dev.	Min	Median	Max
Panel A. Dependent variables						
<i>COV</i>	825	6.368	2.140	0	7	8
<i>DEFAULT_COV</i>	825	1.727	0.601	0	2	2
<i>PROTECTION_COV</i>	825	4.641	1.669	0	5	6
<i>INFORMATION_RIGHTS</i>	825	0.903	0.296	0	1	1
<i>NON_COMPETE_CLAUSES</i>	825	0.824	0.381	0	1	1
<i>REDEMPTION_RIGHTS</i>	825	0.868	0.339	0	1	1
<i>DRAG_ALONG_RIGHTS</i>	825	0.411	0.492	0	0	1
<i>TAG_ALONG_RIGHTS</i>	825	0.858	0.349	0	1	1
<i>LIQUIDATION_PREFERENCES</i>	825	0.804	0.397	0	1	1
<i>ANTI_DILUTION_RIGHTS</i>	825	0.869	0.338	0	1	1
<i>PREEMPTIVE_RIGHTS</i>	825	0.832	0.375	0	1	1
Panel B. Independent variables						
<i>PROVINCIAL_EPU</i>	825	4.650	0.504	3.246	4.697	5.751
<i>TURNOVER</i>	825	0.206	0.405	0	0	1
<i>VALUATION</i>	825	10.654	1.493	6.482	10.717	14.373
<i>OWNERSHIP</i>	825	6.443	5.899	0.240	4.510	28.570
<i>FIRST_ROUND</i>	825	0.573	0.495	0	1	1
<i>SECOND_ROUND</i>	825	0.139	0.347	0	0	1
<i>THIRD_ROUND</i>	825	0.110	0.313	0	0	1
<i>SYNDICATION</i>	825	0.639	0.481	0	1	1
<i>SAME_PROVINCE</i>	825	0.484	0.500	0	0	1
<i>BOARD_SEATS</i>	825	0.818	0.608	0	1	3
<i>GDP_GROWTH</i>	825	5.906	2.631	−6.800	6.700	9.400
<i>CONSUMER_CONFIDENCE</i>	825	4.757	0.069	4.603	4.776	4.841
<i>ECONOMIC_BOOM</i>	825	4.587	0.065	4.336	4.586	4.706
<i>PRODUCTIVITY_G_VOL</i>	825	16.243	49.709	0.210	2.636	264.397
<i>STK_MKT_VOL</i>	825	0.130	0.039	0.082	0.123	0.302

This table presents the summary statistics for the main variables used in our analysis. The sample contains 825 financing contracts between 14 VCs and 818 entrepreneurial firms, extending from 2011 to 2020. Panel A presents the summary statistics for the covenant variables and comprehensive covenant indices. Covenant variables are dummy variables that take the value of one if a certain covenant is included in the contracts, and zero otherwise. Comprehensive covenant indices comprise three variables: *COV*, *DEFAULT_COV*, and *PROTECTION_COV*, which are the sum of all covenant variables; the sum of *INFORMATION_RIGHTS* and *NON_COMPETE_CLAUSES*; and the sum of *REDEMPTION_RIGHTS*, *DRAG_ALONG_RIGHTS*, *TAG_ALONG_RIGHTS*, *LIQUIDATION_PREFERENCES*, *ANTI_DILUTION_RIGHTS*, and *PREEMPTIVE_RIGHTS*, respectively. Panel B presents the summary statistics for the independent variables. See [Appendix A](#) for definitions of these variables.

The construction of these two measures is detailed as follows. First, we construct a monthly China's provincial EPU index based on the daily newspaper in each province ([Baker et al., 2022](#); [Elkamhi et al., 2024](#)).¹⁰ We obtain newspaper contents and search for related keywords through the digital archives of WiseNews. For each newspaper, we identify relevant articles by searching for keywords meeting the following three criteria: (1) economy, (2) uncertainty, and (3) policy, using the term sets established by [Davis et al. \(2019\)](#). The monthly count of articles is scaled by the number of articles that satisfy criterion (1) for the same month. Following [Baker et al. \(2016\)](#), we then standardize and normalize this series to obtain the provincial EPU index. As shown in [Appendix B](#), this index is a reasonable proxy for local EPU and effectively reflects the EPU faced by VCs and entrepreneurs. Our proxy, *PROVINCIAL_EPU*, is defined as the natural logarithm of this EPU index for the province where the startup is located in the month when the VC deal is completed.

Second, we create a dummy variable, *TURNOVER*, to capture EPU induced by political turnover. It equals one if there is a change of provincial Party secretary or governor in the province where the startup is located during the six months prior to the VC deal, and zero otherwise.

3.4. Control variables

Consistent with established empirical work, our regression specifications incorporate comprehensive control variables spanning venture-related, VC-related, and macroeconomic variables that may affect VC contracting. First, we incorporate a set of entrepreneurial firm characteristics as control variables. *VALUATION* is the natural logarithm of the

firm's post-money valuation, to account for potential trade-offs between firm valuation and contractual protection for VCs ([Bengtsson and Sensoy, 2011](#)). *OWNERSHIP* is the percentage of shares obtained by the VC in the financing round. Moreover, we include a set of firm's financing round indicators (*FIRST_ROUND*, *SECOND_ROUND*, *THIRD_ROUND*), which denote whether the financing round is the firm's first, second, or third round of financing since inception.¹¹

Second, we control for VC characteristics. *SYNDICATION* is an indicator variable that equals one if there is more than one VC investor in the financing round, and zero otherwise. Syndication is a means of reducing the risk of VCs' portfolios through a standard diversification strategy ([Lockett and Wright, 1999](#)). As syndication inherently mitigates investment risk through diversification, VCs may put less emphasis on stringent contractual protections to minimize contracting costs ([Holmström, 1979](#)). *SAME_PROVINCE* is an indicator variable that is equal to one if the VC and the startup are located in the same province, and zero otherwise. This variable aims to rule out potential geographical proximity effects on contract designs ([Bengtsson and Ravid, 2009](#)). *BOARD_SEATS* measures the number of board positions secured by VC firms after the investment. Board representation enables VCs to directly monitor entrepreneurs. Consequently, VCs may prioritize obtaining more board seats rather than negotiating for more investor-friendly covenants. We therefore include *BOARD_SEATS* to control for VCs' board representation.

Third, we control for macroeconomic conditions, as [Kaplan and Strömberg \(2004\)](#) point out that external risks significantly affect the

¹⁰ If the daily newspaper has incomplete data, we replace it with another leading local newspaper. Detailed information about the newspapers is provided in [Appendix B](#).

¹¹ To avoid perfect collinearity, the dummy variable representing the firm's fourth or later financing round is omitted.

design of VC contracts.¹² The macroeconomic control variables are listed as follows. *GDP_GROWTH* measures the year-on-year quarterly growth in real GDP. *Gulen and Ion (2016)* posit that policy uncertainty exhibits countercyclical patterns, thereby implying a potential association with poor economic prospects. Thus, we incorporate two expectation-based indicators: *CONSUMER_CONFIDENCE* and *ECONOMIC_BOOM*. The former is defined as the natural logarithm of China's consumer confidence index, analogous to the Michigan consumer confidence index. The latter is calculated as the natural logarithm of economic boom index derived from the response of entrepreneurs to the survey about macroeconomic conditions and firm performance. *Baker and Bloom (2013)* demonstrate that increased policy uncertainty is highly correlated with the increase in general economic uncertainty. Therefore, we introduce *PRODUCTIVITY_G_VOL* and *STK_MKT_VOL* to proxy for economic uncertainty. *PRODUCTIVITY_G_VOL* denotes the productivity growth volatility, which equals the cross-sectional standard deviation of productivity growth for all public firms in each quarter. *STK_MKT_VOL* is the stock market volatility, and is measured by the cross-sectional standard deviation of monthly returns for stocks in the Chinese A-share market.

Panel B of *Table 4* summarizes the statistics of these control variables. Our sample shows that the average post-money valuation of startups, adjusted for inflation, is 1236.3 million RMB. After the investment, the VC firm obtains an average of 6.4 % of the startup's equity. First round financings account for more than half of the deals in our sample. Pertaining to syndication, 63.9 % of the deals involve syndication with multiple VC investors. Geographically, VCs and startups are located in the same province in approximately half of the deals. On average, VCs obtain 0.8 board seats in the entrepreneurial firm after investment.

4. Main empirical results

In this section, we investigate our hypothesis and present the main findings on EPU's impact on VC contracts. In *Section 4.1*, we report our baseline results regarding comprehensive covenant indices. *Section 4.2* presents the regression results based on the eight individual covenants. *Section 4.3* addresses potential endogeneity issues that may bias our results. *Section 4.4* implements multiple robustness tests to validate our findings.

4.1. Baseline results

To investigate the effect of EPU on covenants of VC contracts, we employ the following model:

$$INDEX_{i,t} = \alpha + \beta EPU_t + \gamma CONTROL_{i,t} + FIXED_EFFECT + \varepsilon_{i,t} \quad (1)$$

where i indexes investment rounds of investment, t indexes calendar months. *INDEX* stands for three dependent variables: *COV*, *DEFAULT_COV*, and *PROTECTION_COV*. Our variable of interest is EPU_t , for which we employ two measures, *PROVINCIAL_EPU* and *TURNOVER*. *CONTROL* stands for control variables including startup characteristics, VC characteristics, and macroeconomic conditions, as detailed in *Section 3.4*. *FIXED_EFFECT* comprises (1) industry $\times$ year fixed effects, capturing industry-specific shocks and time trends; (2) industry $\times$ VC firm fixed effects, accounting for VCs' preferences for different industries, and (3) province fixed effects addressing unobserved heterogeneity across provinces.

Table 5 presents the OLS regression results after estimating *Eq. (1)*. Columns (1) to (3) show the results with *PROVINCIAL_EPU* as the EPU measure, with the dependent variables being the comprehensive

covenants (*COV*), default covenants (*DEFAULT_COV*), and protection covenants (*PROTECTION_COV*), respectively. The coefficient of *PROVINCIAL_EPU* is positive and significant at the 1 % level in column (1), supporting H1a that higher EPU leads to more extensive use of investor-friendly covenants in VC contracts. In terms of economic significance, a one-standard-deviation increase in raw provincial EPU index (67.5) above its mean (103.3), equivalent to its increase by 65 % (67.5/103.3), corresponds to a 0.13 (0.65×0.202) increase in the number of investor-friendly covenants in VC contracts. Similar results can be observed from columns (2) and (3), indicating a higher tendency of VCs to use both default covenants and protection covenants in the contracts when faced with elevated EPU.

Columns (4) to (6) exhibit the results with *TURNOVER* as the EPU measure. The coefficients of *TURNOVER* are positive and significant in all three columns. In column (4), the coefficient of *TURNOVER* is 0.563, meaning that when a turnover of provincial leaders occurs in a province, the number of investor-friendly covenants in VC contracts of investments in this province is 0.563 more than those of investments in other provinces. These results are consistent with our findings based on *PROVINCIAL_EPU*, alleviating concerns that the results are driven by general economic conditions rather than EPU.

4.2. Individual covenants

To address concerns that the results in *Table 5* may be driven by the aggregation of covenant variables, we run separate OLS regressions using *Eq. (1)* for each individual covenant.¹³ These results are displayed in *Table 6*, in which the dependent variables are dummy variables indicating whether certain covenants are present in VC contracts. These covenants include information rights, non-compete clauses, redemption rights, drag-along rights, tag-along rights, liquidation preferences, and anti-dilution rights. Panel A reports the results using *PROVINCIAL_EPU* as the EPU measure. The coefficients of *PROVINCIAL_EPU* are positive and statistically significant at least at the 5 % level for four out of eight specifications. Panel B reports the results using *TURNOVER* as the EPU measure where the coefficients of *TURNOVER* are positive and significant in five out of the eight specifications. These findings confirm that our main results are unlikely to be driven by aggregation in the index construction.

4.3. Addressing endogeneity

While our findings provide evidence supporting a positive association between EPU and the presence of investor-friendly covenants in VC contracts, these results may be subject to bias due to potential endogeneity concerns. Specifically, some omitted factors, such as economic conditions, may concurrently influence both EPU and VC contracting. Although our baseline specification has incorporated controls for economic expectations and economic uncertainty, which partially alleviates this concern, we further implement an instrumental variable approach in this section to address potential endogeneity concerns.

First, we employ the intensity of the anti-corruption campaign in each province of China as an instrumental variable for *PROVINCIAL_EPU*. During the early 2000s, China witnessed rapid economic growth along with severe corruption, which not only impeded economic development but also induced social problems (*Cao et al., 2018*). Following the leadership transition in November 2012, the new administration dramatically increased the efforts in curbing corruption, most notably through the implementation of the "Eight-point Policy", which is generally regarded as the start of the anti-corruption campaign. This unprecedented initiative resulted in disciplinary actions against over 2.9 million people by 2019, including seven national leaders and

¹² *Kaplan and Strömberg (2004)* classify market size, customer adoption, competition, and exit condition risks as external risks.

¹³ Following *Bai and Jia (2016)* and *Gu et al. (2022)*, we use a linear probability model estimated by OLS.

Table 5
EPU and comprehensive covenant indices.

VARIABLES	(1) COV	(2) DEFAULT_COV	(3) PROTECTION_COV	(4) COV	(5) DEFAULT_COV	(6) PROTECTION_COV
PROVINCIAL_EPU	0.202*** (3.03)	0.107*** (3.65)	0.095* (1.85)			
TURNOVER				0.563*** (3.87)	0.108** (2.72)	0.455*** (4.05)
VALUATION	−0.383*** (−4.69)	−0.103*** (−3.36)	−0.280*** (−4.94)	−0.356*** (−3.71)	−0.094** (−2.65)	−0.262*** (−4.00)
OWNERSHIP	−0.050*** (−3.67)	−0.016*** (−4.40)	−0.034** (−2.57)	−0.049*** (−3.27)	−0.016*** (−4.80)	−0.033** (−2.35)
FIRST_ROUND	1.098*** (9.31)	0.339*** (7.55)	0.759*** (7.35)	1.118*** (9.75)	0.348*** (7.35)	0.770*** (7.97)
SECOND_ROUND	1.060*** (3.90)	0.338*** (4.73)	0.722*** (3.12)	1.063*** (3.88)	0.343*** (4.53)	0.720*** (3.17)
THIRD_ROUND	0.398 (1.21)	0.143** (2.94)	0.255 (0.86)	0.427 (1.53)	0.159*** (3.47)	0.268 (1.05)
SYNDICATION	0.077 (0.73)	0.046 (1.29)	0.031 (0.38)	0.065 (0.70)	0.041 (1.31)	0.023 (0.32)
SAME_PROVINCE	0.220 (1.37)	−0.019 (−0.53)	0.240 (1.61)	0.217 (1.11)	−0.027 (−0.72)	0.243 (1.38)
BOARD_SEATS	1.308* (2.11)	0.339** (2.38)	0.970* (2.03)	1.314* (2.09)	0.343** (2.37)	0.972* (2.00)
GDP_GROWTH	0.134** (2.78)	0.042** (2.39)	0.092** (2.97)	0.131** (2.68)	0.044** (2.64)	0.088** (2.69)
CONSUMER_CONFIDENCE	4.446*** (3.07)	1.633*** (3.62)	2.813* (2.02)	3.600** (2.96)	1.268** (2.67)	2.332* (1.93)
ECONOMIC_BOOM	−4.517*** (−6.28)	−1.451*** (−4.96)	−3.066*** (−6.19)	−4.375*** (−5.95)	−1.419*** (−4.95)	−2.955*** (−5.59)
PRODUCTIVITY_G_VOL	−0.000 (−0.13)	0.000 (0.29)	−0.000 (−0.19)	−0.000 (−0.25)	0.000 (0.21)	−0.001 (−0.30)
STK_MKT_VOL	1.487 (0.46)	0.363 (0.28)	1.124 (0.55)	1.191 (0.35)	0.326 (0.25)	0.865 (0.40)
Constant	−2.135 (−0.39)	0.208 (0.19)	−2.342 (−0.40)	0.898 (0.22)	1.950 (1.38)	−1.052 (−0.24)
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825
Adjusted R-squared	0.338	0.323	0.336	0.345	0.322	0.344

This table reports the results of OLS regressions in which the dependent variables are comprehensive covenant indices. *PROVINCIAL_EPU* is the natural logarithm of EPU index for the province where the startup is located in the month the VC deal completes. *TURNOVER* is an indicator of whether there is a local officials' turnover in the province where the startup is located during the six months prior to the VC deal. See Appendix A for definitions of variables. All specifications include industry $\times$ year, industry $\times$ VC firm, and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the VC firm level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

hundreds of high-ranking officials and military officers (Griffin et al., 2021), thereby creating significant exogenous variation in policy uncertainty across provinces.

To measure the intensity of the anti-corruption campaign, we collected data from the official website of the Central Commission for Discipline Inspection (CCDI), which is the leading agency responsible for anti-corruption activities.¹⁴ This website releases timely news regarding investigations and disciplinary actions against corrupt officials, ranging from deputy national level to deputy municipal/ department level positions. We identify relevant provinces for each news based on the corrupt official's position. We count the number of announcements related to each province to construct a measure of the anti-corruption intensity at a monthly frequency. Higher values of this measure represent higher intensity of the anti-corruption campaign. The data on CCDI is available only after December 2012, when the large-scale anti-corruption campaign started.

A valid instrumental variable should satisfy both the relevance and exclusion conditions. The relevance condition implies that our instrumental variable should be strongly correlated with EPU in each province. Previous studies indicate that the downfall of corrupt officials leads to new appointments and potential policy discontinuity (Chen et al.,

2018; Kim et al., 2018). Moreover, many corruption cases involve colluding networks of officials, so single investigation often triggers cascading personnel changes, creating substantial policy uncertainty.¹⁵ Consequently, the intensity of the anti-corruption campaign in each province has a positive effect on local EPU.

The exclusion restriction requires that our instrumental variable affects VC contracting exclusively through provincial EPU. We argue that this condition holds for several reasons. First, VC firms have minimal influence over CCDI's disciplinary decisions against high-ranking officials. Second, since CCDI usually collects evidence covertly (Griffin et al., 2021), VC firms are less likely to learn about the probe into officials prior to the public announcement and determine the contract terms based on the information. Hence, our instrumental variable impacts VC contracting only indirectly by elevating local EPU.

We report the 2SLS regression results in Table 7. Column (1) reports the first-stage regression results with provincial EPU index as the dependent variable. It can be observed from results that the coefficient of the instrument is positive and significant at the 1 % level, suggesting that the anti-corruption campaign in each province increases local EPU. The corresponding first-stage F-statistic of 42.04 substantially exceeds

¹⁴ We also collected data from the website of Provincial Commission for Discipline Inspection of each province as a supplement.

¹⁵ One example of the landslide-style corruption exists in Shanxi province, with seven provincial-level and ministerial-level crooked officials brought down in 2014.

Table 6
EPU and individual covenants.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INFORMATION_RIGHTS	0.049*** (3.37)	0.058** (2.63)	0.006 (0.24)	−0.015 (−0.27)	0.038** (2.56)	−0.036*** (−4.10)	0.028 (1.15)	0.075** (2.41)
NON_COMPETE_CLAUSES	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
REDEMPTION_RIGHTS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DRAW_ALONG_RIGHTS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TAG_ALONG_RIGHTS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LIQUIDATION_PREFERENCES	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANTI_DILUTION_RIGHTS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PREEMPTIVE_RIGHTS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825	825	825
Adjusted R-squared	0.247	0.346	0.250	0.253	0.264	0.234	0.290	0.393
Panel B. Use official turnovers as the EPU measure								
TURNOVER	0.030 (1.08)	0.079*** (3.17)	0.085** (2.73)	0.048 (1.27)	0.053* (1.81)	0.108*** (3.73)	0.112*** (6.11)	0.050 (1.40)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825	825	825
Adjusted R-squared	0.245	0.348	0.257	0.254	0.265	0.241	0.302	0.389

This table reports the results of OLS regressions in which the dependent variables are individual covenants. Panel A reports the results with *PROVINCIAL_EPU* as the EPU measure. Panel B reports the results using *TURNOVER* to proxy for EPU. *PROVINCIAL_EPU* is the natural logarithm of EPU index for the province where the startup is located in the month the VC deal completes. *TURNOVER* is an indicator of whether there is a local officials' turnover in the province where the startup is located during the six months prior to the VC deal. See Appendix A for definitions of variables. All specifications include industry × year, industry × VC firm, and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the VC firm level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

the critical values from the [Stock and Yogo \(2005\)](#) weak instrument test. Therefore, our analysis does not appear to suffer from the weak instrument problem. Columns (2) through (4) display the second-stage regression results where the positive relationship between EPU and investor-friendly covenants in VC contracts remains significantly positive under this instrumental variable specification.

Second, we employ the provincial official's connections with top leaders as an instrumental variable for *TURNOVER* ([Xu et al., 2016](#)). In China's political system, provincial officials nominally serve five-year terms aligned with People's Congress cycles, therefore leadership changes are theoretically exogenous to VC firms' decisions. Nevertheless, there are still potential concerns regarding the strategic timing of investments made by VC firms. Specifically, investors could theoretically avoid making investments immediately following government successions, which introduces self-selection bias. In practice, however, official turnovers occur frequently before completing five-year terms. According to our data, during 2011 to 2020, only 16 % provincial officials completed their full five-year terms, indicating that official turnovers are largely unpredictable for most market participants, which alleviates the concern of the self-selection issue. However, [Li and Zhou \(2005\)](#) find that official turnovers could be driven by local economic performance. This suggests that using official turnovers to proxy for EPU may not be completely immune to the potential endogeneity issue. In the following we conduct instrumental variable analysis to mitigate endogeneity concerns.

The tie with top leaders serves as a valid instrumental variable of *TURNOVER* as it satisfies both the relevance and exclusion conditions. First, connections with top leaders significantly influence the likelihood of an official's promotion to higher-ranking positions. When officials establish relational ties with superiors that cultivate a shared organizational identity, they tend to garner greater trust, thereby enhancing their promotion prospects ([Shih et al., 2012](#); [Oppper et al., 2015](#)). Second, the provincial officials' tie with top leaders is not directly related to VC contract designs.

Following the political network literature (e.g., [Oppper et al., 2015](#)), we identify political connections of officials through three distinct dimensions: (1) shared native place, defined as officials originating from the same provincial-level administrative region; (2) alumni ties, established when both officials graduated from the same university; and (3) prior work associations, identified when both officials served in the same branch of the Party or government during the same period. To assess whether a pair of officials are connected, we collect their biographies from the Internet and obtain data on their native places, educational backgrounds, and career histories. We construct the variable *TIE* to measure whether provincial leaders have connections with national leadership. It is an indicator variable that takes the value of one if provincial Party secretaries or provincial governors have shared hometown, alumni ties, or prior work associations with members of China's supreme decision-making body, the Standing Committee of the Political Bureau of the Communist Party of China Central Committee, and zero otherwise.

We conduct a 2SLS regression and report the results in [Table 8](#). The first-stage regression results, listed in column (1), demonstrate a significant positive relationship between *TIE* and *TURNOVER*, confirming that the relevance requirement for the instruments is satisfied. The second-stage results, shown in columns (2) to (4), reveal a statistically positive relationship between political turnover-induced EPU and the inclusion of investor-friendly covenants in VC contracts.

4.4. Other robustness checks

We perform multiple robustness checks in order to validate our main findings. First, we repeat the baseline analysis using a subsample that excludes post-COVID-19 pandemic deals. The pandemic's economic shock and associated lockdowns may have significantly altered VC investment process and contract designs, as face-to-face sourcing and

Table 7

Instrumental variable analysis for provincial EPU index.

VARIABLES	(1) <i>PROVINCIAL_EPU</i>	(2) <i>COV</i>	(3) <i>DEFAULT_COV</i>	(4) <i>PROTECTION_COV</i>
<i>ANTI_CORRUPTION</i>	0.261*** (6.48)			
<i>PROVINCIAL_EPU</i>		0.933*** (2.92)	0.361*** (2.71)	0.572** (2.48)
Controls	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Observations	806	806	806	806
Adjusted R-squared	0.493	0.317	0.299	0.318
Cragg-Donald Wald F statistic	42.04			

This table reports the results of the instrumental variable approach associated with provincial EPU index. The instrumental variable is the intensity of the anti-corruption campaign (*ANTI_CORRUPTION*). Column (1) presents the results of the first-stage regression in which the dependent variable is *PROVINCIAL_EPU*. Columns (2) through (4) present the results of the second-stage regression in which the dependent variables are comprehensive covenant indices. *PROVINCIAL_EPU* is the natural logarithm of EPU index for the province where the startup is located in the month the VC deal completes. See Appendix A for definitions of variables. All specifications include industry $\times$ year, industry $\times$ VC firm, and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the VC firm level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Table 8

Instrumental variable analysis for official turnover.

VARIABLES	(1) <i>TURNOVER</i>	(2) <i>COV</i>	(3) <i>DEFAULT_COV</i>	(4) <i>PROTECTION_COV</i>
<i>TIE</i>	0.231*** (5.50)			
<i>TURNOVER</i>		1.820** (2.21)	0.368** (2.03)	1.451* (1.90)
Controls	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Observations	825	825	825	825
Adjusted R-squared	0.339	0.305	0.301	0.304
Cragg-Donald Wald F statistic	30.30			

This table reports the results of the instrumental variable approach associated with official turnover. The instrument variable is provincial administrators' ties with top leaders (*TIE*). Column (1) presents the results of the first-stage regression in which the dependent variable is *TURNOVER*. Columns (2) through (4) present the results of the second-stage regression in which the dependent variables are comprehensive covenant indices. *TURNOVER* is an indicator of whether there is a local officials' turnover in the province where the startup is located during the six months prior to the VC deal. See Appendix A for definitions of variables. All specifications include industry $\times$ year, industry $\times$ VC firm, and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the VC firm level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

selection were no longer available. This situation amplifies the information asymmetry between VCs and entrepreneurs, which may impact VC contracts. Gompers et al. (2021) provide evidence that VCs expect to obtain more investor-friendly covenants during the COVID-19 pandemic. Hence, we exclude investment deals in 2020 and repeat the baseline analysis. As shown in Panel A of Table 9, both *PROVINCIAL_EPU* and *TURNOVER* maintain positive and significant coefficients, confirming our results' robustness to pandemic-related distortions.

Second, we re-estimate the baseline regressions using Poisson model as this model can accurately reflect the nonnegative, ordinal nature of the dependent variable (Gompers and Lerner, 1996). The results of this test, as reported in Panel B of Table 9, demonstrate that the coefficients of EPU measures are significant across all models, indicating that our

findings are robust to alternative estimation methods.

Third, we employ alternative measures for official turnovers to verify the robustness of our model. Our first alternative measure focuses on unexpected turnovers. If an official is replaced before the scheduled government successions, most market participants cannot anticipate this turnover, thereby causing greater policy uncertainty. In this spirit, we define *TURNOVER_UE* as an indicator of whether there is a local official turnover before the expected successions in the province where the startup is located during the six months prior to the VC deal. The second measure examines the turnover due to external appointments. Based on the previous position of the newly appointed official, official turnovers can be categorized into external appointments and local promotions. The appointment of an outsider can lead to a more dramatic change in local economic policies. We define *TURNOVER_EX* as an indicator of whether there is a local officials' turnover due to external appointments in the province where the startup is located during the six months prior to the VC deal. We use these two measures to repeat the baseline regressions. The results, shown in Panel C of Table 9, confirm that our findings are robust to alternative EPU measures.

Fourth, we conduct a placebo test to mitigate the concern that our baseline results occur because of randomness. This test involves systematically reassigning provincial EPU indices for VC contracts through random permutations. Specifically, for each province in our sample, we randomly shuffle provincial EPU indices by month across our sample period, which results in VC contracts matched with the EPU index of another month.¹⁶ Then we obtain a fictitious *PROVINCIAL_EPU* and re-estimate Eq. (1) with *COV* as the dependent variable. After repeating this process 500 times, we obtain a distribution of coefficients of *PROVINCIAL_EPU*, as plotted in Fig. 1. We can observe that the pseudo-coefficients of *PROVINCIAL_EPU* are centered on zero and that the majority of the p-values are above 0.1. This evidence effectively eliminates randomness as a plausible explanation for the effect of EPU on VC contracting.

5. Mechanism analysis

This section examines the mechanisms through which EPU affects the inclusion of investor-friendly covenants in VC contracts. Section 5.1 investigates the channel of screening. Section 5.2 examines the channel of bargaining power.

¹⁶ There is a chance that a correct match occurs.

Table 9

Robustness tests.

VARIABLES	(1) COV	(2) DEFAULT_COV	(3) PROTECTION_COV	(4) COV	(5) DEFAULT_COV	(6) PROTECTION_COV
Panel A. Subsample only including investments before 2020						
PROVINCIAL_EPU	0.373** (2.38)	0.130** (2.30)	0.243** (2.39)			
TURNOVER				0.894*** (3.30)	0.166** (2.18)	0.728*** (3.44)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	610	610	610	610	610	610
Adjusted R-squared	0.366	0.375	0.363	0.382	0.376	0.382
Panel B. Poisson model						
PROVINCIAL_EPU	0.029*** (3.25)	0.060*** (3.75)	0.018** (2.01)			
TURNOVER				0.092*** (4.04)	0.069*** (2.79)	0.101*** (4.35)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825
Pseudo R-squared	0.101	0.051	0.093	0.102	0.051	0.094
Panel C. Alternative measures of official turnovers						
TURNOVER_UE	0.635*** (4.43)	0.106* (1.96)	0.529*** (5.35)			
TURNOVER_EX				0.360** (2.17)	0.100** (2.35)	0.260* (1.98)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825
Adjusted R-squared	0.346	0.322	0.346	0.339	0.321	0.338

This table reports the results of a battery of robustness tests for the effect of EPU on covenants in VC contracts. Panel A presents the results of repeating baseline analysis with a subsample consisting of investments before 2020. Panel B presents the results of estimating Eq. (1) with Poisson model. Panel C presents the results with alternative measures of official turnovers. The dependent variables are comprehensive covenant indices. *PROVINCIAL_EPU* is the natural logarithm of EPU index for the province where the startup is located in the month the VC deal completes. *TURNOVER* is an indicator of whether there is a local officials' turnover in the province where the startup is located during the six months prior to the VC deal. *TURNOVER_UE* is an indicator of whether there is a local officials' turnover before the expected successions in the province where the startup is located during the six months prior to the VC deal. *TURNOVER_EX* is an indicator of whether there is a local officials' turnover due to external appointments in the province where the startup is located during the six months prior to the VC deal. See Appendix A for definitions of variables. All specifications include industry $\times$ year, industry $\times$ VC firm, and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the VC firm level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

5.1. Screening

In high-EPU times, VCs have difficulties in distinguishing high-quality startups from low-quality ones. Investor-friendly covenants serve as an effective screening mechanism, as high-quality startups have greater tolerance to the associated costs compared to low-quality startups. Therefore, VCs may strategically include more investor-friendly covenants in the contracts to screen for good startups when EPU increases.

Screening is a strategy in response to adverse selection caused by asymmetric information (Spence, 1973). In this case, we posit that the effect of EPU on VC contracting is more pronounced for investments with higher information asymmetry. To test this hypothesis, we use the startup's age and the industry-level information asymmetry to capture information asymmetry between VCs and entrepreneurs.

We begin by examining the entrepreneurial firm's age. Young firms typically possess limited operational histories, resulting in two informational challenges. First, the assessment of firms' profitability and financial stability becomes more difficult due to insufficient financial track records. Second, short histories of management team provide inadequate evidence of the team's competence and reliability. Hence, VCs are subject to higher levels of information asymmetry when facing younger startups. We conjecture that EPU's positive effect on the

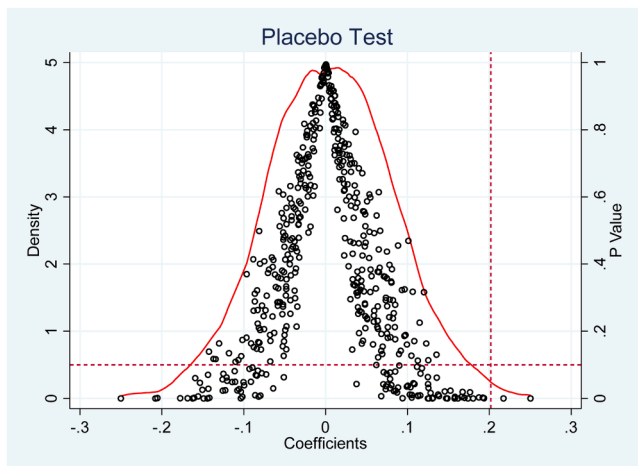


Fig. 1. Placebo tests. This figure shows the results of placebo tests. The red solid line represents the kernel density of the pseudo-coefficients of *PROVINCIAL_EPU*, while the black hollow circle represents the p-value of the pseudo-coefficients of *PROVINCIAL_EPU*. The red dashed vertical line represents the actual coefficient of *PROVINCIAL_EPU* in column (1) of Table 5.

Table 10
Test on the screening channel.

VARIABLES	(1) COV	(2) DEFAULT_COV	(3) PROTECTION_COV	(4) COV	(5) DEFAULT_COV	(6) PROTECTION_COV
Panel A. Firm age						
PROVINCIAL_EPU	0.579** (2.31)	0.213** (2.32)	0.366* (2.10)			
PROVINCIAL_EPU $\times$ FIRM_AGE	−0.057** (−2.28)	−0.016 (−1.72)	−0.041** (−2.32)			
TURNOVER				0.909*** (4.06)	0.159*** (4.85)	0.750*** (3.75)
TURNOVER $\times$ FIRM_AGE				−0.053*** (−3.73)	−0.010*** (−3.78)	−0.043*** (−3.39)
FIRM_AGE	0.243* (1.94)	0.070 (1.52)	0.173* (1.95)	−0.022 (−1.41)	−0.005 (−1.22)	−0.017 (−1.46)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825
Adjusted R-squared	0.345	0.328	0.342	0.348	0.322	0.348
Panel B. Industry-level analyst coverage						
PROVINCIAL_EPU	1.063** (2.83)	0.414*** (3.90)	0.649** (2.21)			
PROVINCIAL_EPU $\times$ NUM_ANALYST	−0.049** (−2.30)	−0.018** (−2.82)	−0.032* (−1.84)			
TURNOVER				1.464** (2.33)	0.347* (1.81)	1.116** (2.49)
TURNOVER $\times$ NUM_ANALYST				−0.053* (−1.86)	−0.014 (−1.53)	−0.039* (−1.96)
NUM_ANALYST	0.228** (2.87)	0.098*** (4.13)	0.130* (1.96)	0.082 (1.41)	0.022 (1.46)	0.060 (1.39)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825
Adjusted R-squared	0.339	0.325	0.336	0.345	0.323	0.345

This table reports the results of examining the screening channel by interacting measures of information asymmetry with the key independent variable. Panel A presents the results where the startup's age is used as the measure of information asymmetry, whereas Panel B reports the results using industry-level analyst coverage as an alternative proxy. *FIRM_AGE* is the number of years from the startup's founding to the VC investment date. *NUM_ANALYST* is the industry-level analyst coverage, measured as the average number of financial analysts following publicly listed firms within the startup's industry. The dependent variables are comprehensive covenant indices. *PROVINCIAL_EPU* is the natural logarithm of EPU index for the province where the startup is located in the month the VC deal completes. *TURNOVER* is an indicator of whether there is a local officials' turnover in the province where the startup is located during the six months prior to the VC deal. See Appendix A for definitions of variables. All specifications include industry $\times$ year, industry $\times$ VC firm, and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the VC firm level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

number of investor-friendly covenants is more pronounced for younger entrepreneurial firms.

To test this proposition, we add the startup's age (*FIRM_AGE*) and an interaction term with the EPU measure to our baseline specification. As presented in columns (1) through (3) in Panel A of Table 10, the interaction term *PROVINCIAL_EPU* $\times$ *FIRM_AGE* is negatively related to the number of investor-friendly covenants in VC contracts, suggesting that VCs include more investor-friendly covenants when contracting with younger entrepreneurial firms. We observe similar results in columns (4) to (6), where *TURNOVER* is used as the EPU measure.

We next examine the industry-level information asymmetry, which varies considerably across industries due to their inherent characteristics and regulatory environments. In industries characterized by high information asymmetry, VCs encounter greater challenges in evaluating the startup's potential due to limited references. Under such conditions, VCs are more inclined to employ stringent contractual terms to screen for high-quality startups. Consequently, the positive effect of EPU on the presence of investor-friendly covenants in VC contracts is expected to be amplified for startups operating in an industry with higher information asymmetry. Following Chemmanur et al. (2018), we measure the industry-level information asymmetry using the average number of analysts within each industry. This metric exhibits an inverse relationship with information asymmetry: The greater the number of analysts

following firms in an industry, the lower the degree of information asymmetry in that industry.

We then interact our industry-level information asymmetry proxy, *NUM_ANALYST*, with the EPU measure to test our conjecture. As shown in Panel B of Table 10, the interaction term in columns (1) and (4) is negative and statistically significant, consistent with our prediction.

Overall, the effect of EPU on VC contracting is more pronounced when the entrepreneurial firm is younger or operates in an industry with lower analyst coverage. In such settings, VCs face more severe information asymmetry. These results are consistent with the screening channel, whereby VCs employ investor-friendly covenants to identify high-quality startups under heightened EPU.

5.2. Bargaining power

The terms of VC contracts result from cooperative bargaining between entrepreneurs and investors (Bowden, 1994; Ewens et al., 2022). In general, investors with greater bargaining power secure more favorable terms. As discussed in our hypothesis development, EPU may affect VC contract design by altering VCs' bargaining power. Elevated EPU is likely to reduce the supply of VC funds (Bernanke, 1983), thereby decreasing competition among VCs for investment opportunities, which enhances VCs' bargaining power (Inderst and Müller, 2004). We

Table 11
Test on the bargaining power channel.

VARIABLES	(1) COV	(2) DEFAULT_COV	(3) PROTECTION_COV	(4) COV	(5) DEFAULT_COV	(6) PROTECTION_COV
Panel A. VC fund size						
PROVINCIAL_EPU	0.196** (2.26)	0.043 (1.09)	0.153** (2.66)			
PROVINCIAL_EPU × FUND_SIZE	0.061** (2.18)	0.016** (2.53)	0.046 (1.75)			
TURNOVER				0.496** (2.30)	0.105** (2.39)	0.391** (2.19)
TURNOVER × FUND_SIZE				0.075*** (3.09)	0.008** (2.69)	0.067*** (3.10)
FUND_SIZE	0.022 (0.84)	−0.002 (−0.61)	0.024 (1.04)	0.014 (0.65)	−0.004 (−1.39)	0.019 (0.90)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825
Adjusted R-squared	0.340	0.320	0.339	0.347	0.321	0.349
Panel B. VC reputation						
PROVINCIAL_EPU	0.167** (2.17)	0.013 (0.57)	0.154** (2.40)			
PROVINCIAL_EPU × LEAD_RATIO	2.301*** (3.49)	1.320*** (6.84)	0.982* (1.94)			
TURNOVER				0.325* (2.09)	0.109*** (4.25)	0.216 (1.55)
TURNOVER × LEAD_RATIO				1.845** (2.82)	0.174 (0.68)	1.671** (3.00)
LEAD_RATIO	−12.260*** (−4.08)	−6.770*** (−7.77)	−5.490** (−2.37)	−1.524*** (−3.02)	−0.357*** (−3.21)	−1.167** (−2.65)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825
Adjusted R-squared	0.340	0.328	0.337	0.339	0.320	0.338

This table presents the results of examining the bargaining power channel through interaction terms between measures of VCs' bargaining power and the key independent variable. Panel A reports the results using VC fund size as the proxy for VCs' bargaining power, while Panel B presents the results based on VC reputation as the proxy. *FUND_SIZE* is the total capital under management of a VC firm. *LEAD_RATIO* is the proportion of completed deals in which the VC firm acts as the lead investor. A higher value of *LEAD_RATIO* indicates greater VC reputation. *PROVINCIAL_EPU* is the natural logarithm of EPU index for the province where the startup is located in the month the VC deal completes. *TURNOVER* is an indicator of whether there is a local officials' turnover in the province where the startup is located during the six months prior to the VC deal. See Appendix A for definitions of variables. All specifications include industry × year, industry × VC firm, and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the VC firm level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Table 12
EPU, covenants, and VC exit performance.

VARIABLES	(1) IPO	(2) IPO_MA	(3) IPO	(4) IPO_MA
PROVINCIAL_EPU	−0.113* (−1.88)	−0.246*** (−3.79)		
PROVINCIAL_EPU × COV	0.010* (1.95)	0.035*** (3.88)		
TURNOVER			−0.286** (−2.89)	−0.190 (−1.74)
TURNOVER × COV			0.038*** (3.56)	0.032*** (3.06)
COV	−0.047 (−1.70)	−0.172*** (−3.90)	−0.004 (−0.40)	−0.011 (−0.76)
Controls	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Observations	825	825	825	825
Adjusted R-squared	0.292	0.131	0.294	0.126

This table reports the results on the effect of the use of investor-friendly covenants on the relation between EPU and VC exit performance. The dependent variables are dummy variables indicating whether the entrepreneurial firm successfully exits. *IPO* is a dummy variable that equals one if the firm goes public, and zero otherwise. *IPO_MA* is a dummy variable that equals one if the firm goes public or is acquired by another firm, and zero otherwise. *PROVINCIAL_EPU* is the natural logarithm of EPU index for the province where the startup is located in the month the VC deal completes. *TURNOVER* is an indicator of whether there is a local officials' turnover in the province where the startup is located during the six months prior to the VC deal. *COV* is the comprehensive covenant index that aggregates the eight dummy variables for covenants. See Appendix A for definitions of variables. All specifications include industry × year, industry × VC firm, and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the VC firm level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

therefore conjecture that the positive impact of EPU on the adoption of investor-friendly terms is more pronounced for VCs with greater bargaining power. To test this, we consider two dimensions of VCs' bargaining power: VC fund size and VC reputation.

The first dimension we explore is VC fund size. Large VC funds typically possess greater bargaining power (Cumming and Dai, 2011). First, large VC funds have deeper pockets, allowing entrepreneurs to raise larger financing rounds. Second, large VC funds are capable of providing follow-on funding for startups, which reduces startups' financing risks. Third, their broad portfolio of investment opportunities affords them greater flexibility to walk away from deals that fail to meet their requirements. Collectively, these advantages strengthen the bargaining position of large VC.

We calculate the total fund size managed by the VC firm, *FUND_SIZE*, and interact this variable with the EPU measure to re-estimate our baseline regression. The results, reported in Panel A of Table 11, show that the positive relationship between EPU and investor-friendly covenants is more pronounced for larger VCs.

The second dimension we explore is VC reputation. Reputable VCs are expected to have higher bargaining power (Ewens et al., 2022). First, well-established VCs offer high-quality value-adding services for startups, including strategic guidance, industry connections, and operational expertise, which significantly improves startups' prospects. Second, an investment from a prestigious VC serves as a strong positive signal to the market, attracting follow-on investors, customers, and talented employees. In exchange for these benefits, entrepreneurs are often willing to accept less attractive financial terms for the affiliation with reputable VCs (Hsu, 2004). Furthermore, there are only a limited number of high-reputation VCs, while numerous startups compete to secure their funding. Therefore, reputable VCs are better positioned to negotiate and obtain more investor-friendly terms.

We use a VC's role as the lead investor in syndicated investments as a proxy for its reputation, as lead investors are typically VCs with stronger reputational capital (Plagmann and Lutz, 2019). *LEAD_RATIO* is defined as the proportion of completed deals in which the VC acts as the lead investor. We include an interaction term between *LEAD_RATIO* and the EPU measure to test our conjecture. Panel B of Table 11 reports the results of this test. One can observe that the effect of EPU on the presence of investor-friendly covenants is intensified for VCs with a higher reputation.

To summarize, we find that the increase in the use of investor-friendly covenants during high EPU periods is more pronounced for larger or more reputable VCs. These VCs enjoy stronger bargaining power in contractual negotiations. This evidence is consistent with the view that EPU increases the use of investor-friendly covenants in VC contracts by enhancing VCs' bargaining power.

6. EPU, covenants, and VC exit performance

In this section, we investigate VCs' exit performance upon inclusion of more investor-friendly covenants in the contracts for the investments made during high-EPU periods. We consider IPOs and M&As as two successful exit pathways (Sørensen, 2007; Bottazzi et al., 2016). *IPO* is a dummy variable that equals one if the firm goes public, and zero otherwise. *IPO_MA* is a dummy variable that equals one if the firm goes public or is acquired by another firm, and zero otherwise.

Table 12 reports the regression results. In columns (1) and (3), we use *IPO* as the dependent variable. The coefficient of *PROVINCIAL_EPU* is negative and statistically significant in column (1), suggesting that entrepreneurial firms are less likely to go public when faced with high levels of EPU. The coefficient of *PROVINCIAL_EPU* $\times$ *COV* is positive and statistically significant, suggesting that including more investor-friendly covenants in the contracts mitigates the adverse effect of EPU on a successful IPO. This mitigating effect remains significant when *TURN-OVER* is used as the EPU measure in column (3). Columns (2) and (4) show consistent results when using *IPO_MA* as the dependent variable, demonstrating the robustness to alternative definitions of a successful exit.

7. Conclusion

This study investigates the effect of EPU on covenants in VC contracts, providing new insights into the influence of government and policies on VC contract design. Based on 825 real contracts between VCs and entrepreneurs in China, we identify eight key investor-favorable covenants and explore the EPU's effect on the presence of these covenants. Our empirical analysis shows that VCs significantly increase the inclusion of these covenants during periods of high EPU. The results remain robust after addressing endogeneity problems and conducting extensive robustness tests.

We explore two underlying mechanisms: the screening channel and the bargaining power channel. Under the screening channel, VCs use restrictive covenants to screen for potential portfolio companies as distinguishing good startups from bad ones becomes harder when EPU is high. We find that the positive effect of EPU on the adoption of investor-friendly covenants is more pronounced for entrepreneurial firms that are younger or operate in an industry with less analyst coverage, where information asymmetry between VCs and entrepreneurs is more severe. The bargaining power channel reveals that EPU strengthens VCs' negotiating leverage, enabling them to secure more favorable contractual terms. Specifically, we document that the positive effect of EPU on contract terms is stronger for VCs with larger size and higher reputation, which reflects VCs' greater bargaining power.

Finally, we demonstrate that including more investor-friendly covenants in VC contracts mitigates the adverse effect of EPU on VC exit performance.

Overall, our study sheds light on how policy uncertainty influences the operations of the VC industry from a contract-design perspective, highlighting the critical role of government and policies in shaping economic activities in emerging markets like China. These findings contribute to a deeper understanding of institutional factors in entrepreneurial finance.

CRedit authorship contribution statement

Na Ding: Investigation, Formal analysis. **Panpan Feng:** Writing – review & editing, Visualization, Validation, Resources, Methodology. **Jianjun Liu:** Resources, Formal analysis, Data curation. **Zhaoyue Ren:** Writing – original draft, Validation, Software, Methodology, Investigation. **Xueyong Zhang:** Writing – review & editing, Supervision, Resources, Project administration, Funding acquisition, Conceptualization.

Appendix A. Variable definition

Baseline Regression

- *INFORMATION_RIGHTS*: A dummy variable that is equal to one if VC contracts include information rights, and zero otherwise
- *NON_COMPETE_CLAUSES*: A dummy variable that is equal to one if VC contracts include non-compete clauses, and zero otherwise
- *REDEMPTION_RIGHTS*: A dummy variable that is equal to one if VC contracts include redemption rights, and zero otherwise
- *DRAG_ALONG_RIGHTS*: A dummy variable that is equal to one if VC contracts include drag-along rights, and zero otherwise
- *TAG_ALONG_RIGHTS*: A dummy variable that is equal to one if VC contracts include tag-along rights, and zero otherwise
- *LIQUIDATION_PREFERENCES*: A dummy variable that is equal to one if VC contracts include liquidation preferences, and zero otherwise
- *ANTI_DILUTION_RIGHTS*: A dummy variable that is equal to one if VC contracts include anti-dilution rights, and zero otherwise
- *PREEMPTIVE_RIGHTS*: A dummy variable that is equal to one if VC contracts include preemptive rights, and zero otherwise
- *COV*: Sum of the following dummy variables: *INFORMATION_RIGHTS*, *NON_COMPETE_CLAUSES*, *REDEMPTION_RIGHTS*, *DRAG_ALONG_RIGHTS*, *TAG_ALONG_RIGHTS*, *LIQUIDATION_PREFERENCES*, *ANTI_DILUTION_RIGHTS*, and *PREEMPTIVE_RIGHTS*
- *DEFAULT_COV*: Sum of the following dummy variables: *INFORMATION_RIGHTS* and *NON_COMPETE_CLAUSES*
- *PROTECTION_COV*: Sum of the following dummy variables: *REDEMPTION_RIGHTS*, *DRAG_ALONG_RIGHTS*, *TAG_ALONG_RIGHTS*, *LIQUIDATION_PREFERENCES*, *ANTI_DILUTION_RIGHTS*, and *PREEMPTIVE_RIGHTS*
- *PROVINCIAL_EPU*: The natural logarithm of EPU index for the province where the startup is located in the month the VC deal completes
- *TURNOVER*: A dummy variable coded one if there is a change of provincial Party secretary or governor in the province where the startup is located during the six months prior to the VC deal, and zero otherwise
- *VALUATION*: The natural logarithm of firm valuation after the investment, inflation adjusted
- *OWNERSHIP*: The percentage of shares obtained by the VC in the financing round
- *FIRST_ROUND*: A dummy variable that is equal to one if the financing round is the firm's first round of financing since inception, and zero otherwise
- *SECOND_ROUND*: A dummy variable that is equal to one if the financing round is the firm's second round of financing since inception, and zero otherwise
- *THIRD_ROUND*: A dummy variable that is equal to one if the financing round is the firm's third round of financing since inception, and zero otherwise
- *SYNDICATION*: A dummy variable that is equal to one if there is more than one VC investor in the financing round, and zero otherwise
- *SAME_PROVINCE*: A dummy variable that is equal to one if the startup and the lead VC are in the same province, and zero otherwise
- *BOARD_SEATS*: The number of board seats occupied by VCs after the investment
- *GDP_GROWTH*: The year-on-year quarterly growth in real GDP
- *CONSUMER_CONFIDENCE*: The natural logarithm of consumer confidence index released by the National Bureau of Statistics in China
- *ECONOMIC_BOOM*: The natural logarithm of economic boom index released by the National Bureau of Statistics in China
- *PRODUCTIVITY_G_VOL*: The cross-sectional standard deviation of productivity growth (quarter-on-quarter change in net profit normalized by average sales in these two quarters) for all public firms in each quarter
- *STK_MKT_VOL*: The cross-sectional standard deviation of monthly returns for stocks in the Chinese A-share market

Other Tests

- *ANTI_CORRUPTION*: The count of announcements on the investigation and disciplinary treatment of corrupt officials related to each province on the official website of Central Commission for Discipline Inspection and Provincial Commission for Discipline Inspection
- *TIE*: An indicator variable that takes the value of one if provincial Party secretaries or provincial governors have shared hometown, alumni ties, or prior work associations with members of the Standing Committee of the Political Bureau of the Communist Party of China Central Committee, and zero otherwise
- *TURNOVER_UE*: A dummy variable that takes the value of one if there is a local officials' turnover before the expected successions in the province where the startup is located during the six months prior to the VC deal, and zero otherwise
- *TURNOVER_EX*: A dummy variable that takes the value of one if there is a local officials' turnover due to external appointment in the province where the startup is located during the six months prior to the VC deal, and zero otherwise
- *FIRM_AGE*: The number of years from the establishment date of the firm to the investment date
- *NUM_ANALYST*: The average number of analysts following for public listed firms in the industry
- *FUND_SIZE*: The total capital under management of a VC firm
- *LEAD_RATIO*: The proportion of completed deals in which the VC firm acts as the lead investor
- *IPO*: A dummy variable that equals one if the firm goes public, and zero otherwise.
- *IPO_MA*: A dummy variable that equals one if the firm goes public or is acquired by another firm, and zero otherwise

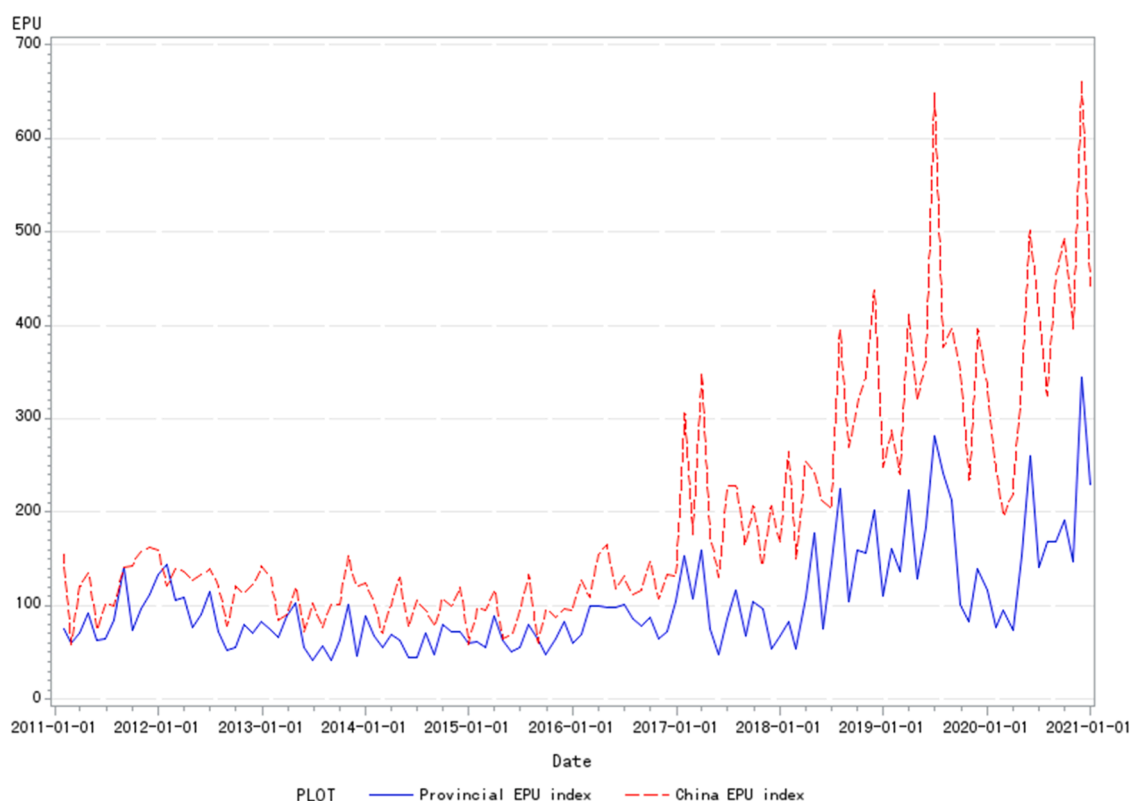


Fig. A1 Provincial EPU index and China EPU index. This figure plots the average value of the provincial EPU index and China EPU index developed by Davis et al. (2019).

Table A1

China's provincial EPU index.

Province	Newspaper	EPU	Province	Newspaper	EPU
Anhui	Xinan Evening News	81.846	Liaoning	Liaoning Daily	90.004
Beijing	Beijing Daily	88.666	Inner Mongolia	Inner Mongolia Daily	86.453
Fujian	Fujian Daily	86.498	Ningxia	Ningxia Daily	82.718
Gansu	Gansu Daily	85.787	Qinghai	Qinghai Daily	81.444
Guangdong	Southern Metropolis Daily	100.913	Shandong	Dazhong Daily	89.810
Guangxi	Guangxi Daily	88.89	Shanxi	Shanxi Daily	88.932
Guizhou	Guizhou Daily	89.574	Shaanxi	Shaanxi Daily	84.973
Hainan	Hainan Daily	85.874	Shanghai	Jiefang Daily	92.353
Hebei	Hebei Daily	87.117	Sichuan	Sichuan Daily	76.986
Henan	Henan Daily	89.641	Tianjin	Tianjin Daily	83.437
Heilongjiang	Heilongjiang Daily	87.265	Xizang	Xizang Daily	77.710
Hubei	Hubei Daily	77.968	Xinjiang	Xinjiang Daily	83.438
Hunan	Hunan Daily	80.807	Yunnan	Yunnan Daily	83.344
Jilin	Jilin Daily	77.866	Zhejiang	Zhejiang Daily	94.626
Jiangsu	Xinhua Daily	91.877	Chongqing	Chongqing Daily	80.239
Jiangxi	Jiangxi Daily	86.227			

This table presents the name of newspapers used to develop China's provincial EPU index and the median of each province's EPU index.

Table A2

Natural disasters and province-level EPU.

VARIABLES	(1) PROVINCIAL_EPU	(2) PROVINCIAL_EPU
<i>TOP_1_INJURIES_AND_FATALITIES</i>	0.141*** (5.37)	
<i>INJURIES_AND_FATALITIES</i>		0.003*** (4.71)
<i>GDP</i>	−0.212** (−2.41)	−0.212** (−2.41)
<i>INCOME</i>	0.130	0.130

(continued on next page)

Table A2 (continued)

VARIABLES	(1) <i>PROVINCIAL_EPU</i>	(2) <i>PROVINCIAL_EPU</i>
	(0.80)	(0.80)
<i>UNEMPLOYMENT</i>	−0.085	−0.085
	(−1.08)	(−1.08)
Constant	6.629***	5.611***
	(9.24)	(8.61)
Year FE	Yes	Yes
Province FE	Yes	Yes
Observations	2439	2439
Adjusted R-squared	0.244	0.246

This table reports the results of examining the relationship between natural disasters and province-level EPU. The data on natural disaster ranges from 2014 to 2020. *TOP_1_INJURIES_AND_FATALITIES* is a dummy variable that takes a value of one for a province that experienced natural disasters in the previous 12 months where the number of injuries and fatalities caused by the events is in the top 1 %, and zero otherwise. *INJURIES_AND_FATALITIES* is the number of injuries and fatalities for a province caused by natural disasters in the previous 12 months. *GDP* is the natural logarithm of the province's GDP. *INCOME* is the per capital disposable income of residents in the province. *UNEMPLOYMENT* is the unemployment rate of the province. All specifications include year and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the province level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Table A3

Province-level EPU and VC investment.

VARIABLES	(1) <i>NUM_DEAL</i>	(2) <i>NUM_DEAL_EARLY</i>	(3) <i>AMT_DEAL</i>
<i>PROVINCIAL_EPU</i>	−0.054**	−0.058**	−0.038**
	(−2.35)	(−2.71)	(−2.12)
<i>NATIONAL_EPU</i>	0.197***	0.187***	0.075**
	(5.18)	(4.93)	(2.36)
<i>GDP</i>	0.339***	0.310***	0.134**
	(3.52)	(3.33)	(2.27)
<i>SECONDARY</i>	0.201	0.247	0.200
	(0.83)	(1.13)	(1.12)
<i>TERTIARY</i>	0.468***	0.448**	0.285
	(2.76)	(2.58)	(1.36)
<i>POPULATION</i>	0.665	0.400	−0.343
	(0.54)	(0.31)	(−0.46)
<i>WAGE</i>	0.000*	0.000*	0.000**
	(1.73)	(1.83)	(2.53)
<i>CPI</i>	−0.020	−0.021*	−0.012
	(−1.63)	(−1.77)	(−1.07)
Constant	−10.372	−8.131	−0.479
	(−1.03)	(−0.77)	(−0.08)
Year FE	Yes	Yes	Yes
Province FE	Yes	Yes	Yes
Observations	3422	3422	3422
Adjusted R-squared	0.773	0.741	0.526

This table reports the results of examining the relationship between province-level EPU and VC investment while controlling for national EPU. The sample is constructed at the province-month level over the period 2011–2020. The dependent variables capture the level of local VC activities. *NUM_DEAL* is the natural logarithm of the number of VC deals in the province during the month. *NUM_DEAL_EARLY* is the natural logarithm of the number of early-round VC deals in the province during the month. *AMT_DEAL* is the natural logarithm of the total amount of VC investment in the province during the month. *PROVINCIAL_EPU* is the natural logarithm of provincial EPU index in the month. *NATIONAL_EPU* is the natural logarithm of China EPU index in the month. *GDP* is the natural logarithm of the province's GDP in the quarter. *SECONDARY* is the proportion of the secondary industry in GDP for the province in the quarter. *TERTIARY* is the proportion of the tertiary industry in GDP for the province in the quarter. *POPULATION* is the natural logarithm of the province's total population in the year. *WAGE* is the province's average wage in the year. *CPI* is the country's CPI in the month. All specifications include year and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the province level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Table A4
Additional robustness tests.

VARIABLES	(1) COV	(2) DEFAULT_COV	(3) PROTECTION_COV	(4) COV	(5) DEFAULT_COV	(6) PROTECTION_COV
Panel A. control for national-level EPU						
PROVINCIAL_EPU	0.174** (3.00)	0.096*** (3.37)	0.078* (2.07)			
TURNOVER				0.604*** (4.07)	0.122** (2.95)	0.481*** (4.28)
NATIONAL_EPU	0.031 (1.12)	0.012* (1.99)	0.019 (0.67)	0.066** (2.30)	0.023** (2.71)	0.043 (1.55)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825
Adjusted R-squared	0.337	0.322	0.335	0.345	0.324	0.344
Panel B. control for local law enforcement						
PROVINCIAL_EPU	0.195** (2.97)	0.104*** (3.62)	0.091* (1.80)			
TURNOVER				0.527*** (3.62)	0.088** (2.38)	0.439*** (3.80)
LAW	−0.129** (−2.20)	−0.059** (−2.19)	−0.070* (−1.83)	−0.099 (−1.69)	−0.055* (−2.09)	−0.044 (−1.10)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-VC FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	825	825	825	825	825	825
Adjusted R-squared	0.339	0.328	0.336	0.345	0.327	0.343

This table reports the results of repeating our baseline regressions while controlling for national EPU and local law enforcement, respectively. Panel A reports the results controlling for national-level EPU, while Panel B presents the results controlling for local law enforcement. *NATIONAL_EPU* is the natural logarithm of China EPU index in the month the VC deal completes. *LAW* is the province-level law score from *NERI Index of Marketization of China's Provinces 2021 Report*. *PROVINCIAL_EPU* is the natural logarithm of EPU index for the province where the startup is located in the month the VC deal completes. *TURNOVER* is an indicator of whether there is a local officials' turnover in the province where the startup is located during the six months prior to the VC deal. See [Appendix A](#) for definitions of variables. All specifications include industry $\times$ year, industry $\times$ VC firm, and province fixed effects. All continuous variables are winsorized at the 1st and 99th percentiles. T-statistics calculated using robust standard errors clustered at the VC firm level are reported in parentheses. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Table A5
Correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 <i>PROVINCIAL_EPU</i>	1.000														
2 <i>TURNOVER</i>	−0.050	1.000													
3 <i>VALUATION</i>	0.271***	−0.047	1.000												
4 <i>OWNERSHIP</i>	−0.127***	0.054	−0.589***	1.000											
5 <i>FIRST_ROUND</i>	−0.026	0.046	−0.349***	0.181***	1.000										
6 <i>SECOND_ROUND</i>	−0.045	−0.006	−0.017	0.030	−0.467***	1.000									
7 <i>THIRD_ROUND</i>	0.074**	0.002	0.151***	−0.076**	−0.408***	−0.142***	1.000								
8 <i>SYNDICATION</i>	0.130***	−0.022	0.277***	−0.279***	−0.144***	0.164***	0.080**	1.000							
9 <i>SAME_PROVINCE</i>	−0.099***	0.029	−0.327***	0.140***	0.295***	−0.109***	−0.155***	−0.100***	1.000						
10 <i>BOARD_SEATS</i>	−0.050	0.054	−0.230***	0.312***	0.016	0.138***	0.010	0.082**	0.002	1.000					
11 <i>GDP_GROWTH</i>	−0.097***	0.129***	−0.139***	0.132***	0.004	0.026	−0.002	−0.118***	−0.012	0.007	1.000				
12 <i>CONSUMER_CONFIDENCE</i>	0.301***	−0.131***	0.147***	−0.061*	−0.021	−0.040	0.040	0.028	−0.094***	0.007	−0.267***	1.000			
13 <i>ECONOMIC_BOOM</i>	0.017	0.173***	−0.049	0.067*	0.031	−0.025	−0.012	−0.113***	−0.025	0.027	0.664***	0.177***	1.000		
14 <i>PRODUCTIVITY</i>	−0.056	0.082**	−0.005	−0.032	0.052	−0.042	−0.012	−0.018	0.050	−0.069**	0.069**	−0.424***	−0.186***	1.000	
15 <i>STK_MKT_VOL</i>	−0.090***	−0.004	0.038	−0.059*	−0.039	0.025	−0.010	−0.000	0.062*	−0.042	−0.020	−0.410***	−0.152***	0.341***	1.000

This table reports correlation coefficients for the variables used in the baseline regression.

Appendix B. Supplementary data

B.1 China's provincial EPU index

This appendix section tests the validity of our China's provincial EPU index in capturing local EPU. We start with providing basic information on our index. [Table A1](#) presents the name of newspapers used to construct the index and the median of EPU index in each province.¹⁷

Next, we examine whether our index successfully captures nationwide EPU and province-specific EPU. We first test the validity of our index in capturing nationwide EPU. Our index consists of an idiosyncratic component that measures province-specific EPU and a systematic component capturing nationwide EPU ([Elkamhi et al., 2024](#)). Averaging the provincial indices cancels out the idiosyncratic component, leaving only the systematic part. Thus, we can isolate the systematic component and compare it with nationwide EPU. To do so, we plot the average value of EPU index for all provinces and China EPU index developed by [Davis et al. \(2019\)](#) during 2011 to 2020. As shown in [Fig. A1](#), our provincial EPU index on average is highly correlated with China EPU index, indicating that our provincial index effectively captures national-level EPU in China.

We further test whether our index captures province-specific EPU by correlating our index with local natural disasters. Natural disasters are exogenous shocks that could directly raise EPU ([Baker et al., 2024](#)). Therefore, we utilize local-level natural disasters to examine the validity of our index in capturing local EPU. Leveraging data from the CSMAR database, we identify natural disaster events across Chinese provinces and, following [Elkamhi et al. \(2024\)](#), construct two measures to reflect the intensity of the natural disaster based on injuries and fatalities. *TOP_1-INJURIES_AND_FATALITIES* is a dummy variable that equals one for a province that experienced natural disasters in the previous 12 months where the number of injuries and fatalities caused by the events is in the top 1 %, and zero otherwise. *INJURIES_AND_FATALITIES* is the number of injuries and fatalities for a province caused by natural disasters in the previous 12 months. We then regress our provincial EPU index on these measures for local natural disasters, controlling for a set of macroeconomic variables.

[Table A2](#) reports the results. The coefficients of *TOP_1-INJURIES_AND_FATALITIES* and *INJURIES_AND_FATALITIES* are both positive and significant at the 1 % level. Overall, these findings indicate that our provincial EPU index is positively correlated with exogenous local natural disaster events that caused human losses, supporting its validity in capturing province-specific EPU.

Moreover, we investigate whether province-level EPU better reflects EPU faced by VCs and entrepreneurs than national EPU. As startups and VCs inevitably have economic ties with companies in other regions, policy-related uncertainty in those regions can also affect them. In this case, one may concern that local EPU fails to capture EPU faced by VCs and startups and consider national EPU as a more suitable measure. To address this concern, we analyze the impact of province-level EPU on VC investment while controlling for national EPU. We collect data on VC investment deals in China from 2011 to 2020 and aggregate these deals at the province-month level. Following [Tian et al. \(2023\)](#), we use three measures to capture the level of local VC activities, including *NUM_DEAL*, *NUM_DEAL_EARLY*, and *AMT_DEAL*. *NUM_DEAL* is the natural logarithm of the number of VC deals in the province during the month. *NUM_DEAL_EARLY* is the natural logarithm of the number of early-round VC deals in the province during the month. *AMT_DEAL* is the natural logarithm of the total amount of VC investment in the province during the month. [Table A3](#) reports the results. The negative and statistically significant coefficients of *PROVINCIAL_EPU* indicate that province-level EPU reduces VC investment even after accounting for the impact of national EPU. This evidence lends support to the validity of province-level EPU as a capable proxy to measure EPU faced by local startups and VCs.

B.2 Additional robustness tests

We perform two additional tests to check the robustness of our results in this subsection. First, we repeat the baseline analysis controlling for national-level EPU. As highlighted in our study, the provincial EPU index contains both an idiosyncratic component that measures province-specific EPU and a systematic component capturing nationwide EPU ([Elkamhi et al., 2024](#)). To isolate the unique effect of province-level EPU on VC contracting, we augment our main regressions by controlling for China's national EPU. The results are reported in Panel A of [Table A4](#). Our results demonstrate that the idiosyncratic provincial EPU component retains its statistical and economic significance in explaining variations in VC contract terms, even after accounting for nationwide EPU.

Second, we include a measure of local law enforcement as an additional control variable in our baseline regressions. Prior studies emphasize the significant role of the legal environment in shaping financial contracting practices ([Lerner and Schoar, 2005](#); [Kaplan et al., 2007](#); [Cumming and Johan, 2008](#)). Therefore, the adoption of particular contractual provisions in VC investments may vary with the quality of local law enforcement. To address this, we perform a robustness test by controlling for local law enforcement using the provincial-level law score obtained from *NERI Index of Marketization of China's Provinces 2021 Report* ([Wang et al., 2021](#)). We present the results in Panel B of [Table A4](#). The positive relationship between local EPU and investor-friendly covenants continues to hold, suggesting that our main conclusions are robust to accounting for differences in local legal enforcement environments.

B.3 Correlation matrix

[Table A5](#)

Data availability

The data that has been used is confidential.

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¹⁷ We present medians instead of means because the mean value of EPU index for each province is set to 100.

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