Pacific-Basin Finance Journal 92 (2025) 102803

Contents lists available at ScienceDirect

Pacific-Basin Finance Journal

journal homepage: www.elsevier.com/locate/pacfin

Economic policy uncertainty and herding behavior in venture capital market: Evidence from China☆

Yicong Sun, Hui Fu *

School of Business, Jiangnan University, No. 1800 Lihu Avenue, Wuxi 214122, Jiangsu, China

ARTICLE INFO

Keywords:
Economic policy uncertainty
Venture capital
Herding behavior

ABSTRACT

This paper investigates the impact of economic policy uncertainty (EPU) on herding behavior in China's venture capital market from 2002 to 2021. The study finds a significant negative relationship between EPU and herding behavior, indicating that venture capitalists are more likely to make independent judgments when EPU rises. Mechanism analysis reveals that under high EPU, investors become more specialized and favor stable mid-to-late-stage projects, which in turn dampens market-wide herding behavior. Further heterogeneity analysis shows that foreign-backed venture capital firms exhibit a more pronounced reduction in herding behavior, while government-backed institutions respond more weakly. In addition, experienced investors and early-stage investors exhibit stronger reductions in herding when EPU rises. This study enriches the understanding of venture capital behavior under uncertainty and offers new empirical evidence to inform policymakers assessing how shifts in macroeconomic expectations influence the allocation of innovation capital.

1. Introduction

Uncertainty affects various aspects of a country's economic activities. In the venture capital market, uncertainty can significantly influence venture capitalists' investment decisions and behaviors. For instance, research by Tian et al. (2023) on the U.S. venture capital market shows that policy uncertainty has a broad negative impact on venture capital activities, including reducing the number of investments and lowering the total amount invested. Lukas et al. (2016) proposed a dynamic model of option exercise games and found that increased uncertainty leads venture capital investors to hold a larger equity share in firms. Furthermore, many researchers focus on economic policy uncertainty (EPU) and investigate venture capitalists' behavior under uncertain economic policies. For example, Qi et al. (2024) found that EPU increases the tendency of VCs to engage in co-investment. Yi et al. (2022) showed that EPU prompts VCs to adopt more specialized investment strategies. Similarly, Huang et al. (2022) demonstrated that under high EPU, venture capitalists slow down their investment pace, and different types of venture capitalists exhibit varying sensitivities to EPU.

This paper also focuses on economic policy uncertainty (EPU) and attempts to explore its impact on herding behavior in the venture capital market. Herding behavior in financial markets has been a widely discussed topic in academia, with numerous studies focusing on herding behavior in stock, fund, and loan markets. However, there is limited literature on herding behavior in the venture capital market. Li et al. (2008) developed a game theory model to demonstrate the existence of herding behavior in China's early venture

☆ This article is part of a Special issue entitled: 'Financial Risk Management: CIRF2024' published in Pacific-Basin Finance Journal.

* Corresponding author.
E-mail address: hui_fu@hotmail.com (H. Fu).

https://doi.org/10.1016/j.pacfin.2025.102803
Received 16 September 2024; Received in revised form 29 April 2025; Accepted 4 May 2025
Available online 6 May 2025

capital market, but their study lacked further empirical analysis. Zhang et al. (2021) conducted the first empirical study on herding behavior in China's venture capital market. By referencing Lakonishok et al. (1992) and Wermers (1999) in the context of stock market herding behavior, they constructed a herding behavior index for the venture capital market by measuring the imbalance of investments across industries. Their empirical findings suggest that herding behavior is driven by positive signals of fundamental information and a high degree of information uncertainty. Theoretically, from the perspective of information dissemination in public markets, high economic policy uncertainty hinders information flow (Bloom, 2014), limiting the efficiency with which venture capitalists utilize information; from the perspective of the investment behavior of venture investors, economic policy uncertainty negatively affects venture capital by reducing risk-taking and weakening exit performance (Qi et al., 2024). Therefore, herding behavior as an important outcome of venture investors' investment decisions, it is reasonable to assume that economic policy uncertainty will have an impact on herd behavior in the venture capital market.

Currently, research on the relationship between economic policy uncertainty and herding behavior in the venture capital market is largely unexplored. Most studies on uncertainty and herding behavior in financial markets have focused on the effects of uncertainty on herding behavior in the interbank, fund, and stock markets. Regarding uncertainty and herding behavior in the interbank market, Uchida and Nakagawa (2007) found that during economic bubbles or periods of market turbulence in the Japanese banking market, banks might choose to follow other banks' lending decisions due to uncertainty about future market trends, thereby exacerbating the herding effect. Similarly, Fang et al. (2021) found that in Taiwan's banking sector, non-state-owned small banks exhibited intensified herding lending behavior during crises and expansion periods, while state-owned banks showed more pronounced irrational herding lending behavior during election periods. In terms of uncertainty and herding behavior in the fund market, Cui et al. (2019) studied the U.S. closed-end fund market and showed that herding behavior among closed-end fund investors is primarily driven by non-fundamental factors and increases with economic and market uncertainty. Wang et al. (2021) reached similar conclusions in the Chinese open-end fund market, where herding behavior among most funds becomes more pronounced during periods of high volatility and increased economic policy uncertainty. For uncertainty and herding behavior in the stock market, Choi and Yoon (2020) noted in their study of the Korean stock market that investors exhibit significant herding behavior under extreme market conditions, and investor sentiment is a major driver of this behavior. Aharon (2021) also suggested that in times of market uncertainty, investors tend to follow the crowd to mitigate portfolio risk. Empirical research by Huang et al. (2015) demonstrated that herding behavior in the Taiwanese stock market intensified during the 2008 financial crisis. However, Lee (2017) found no significant herding behavior in the U.S. stock market during the subprime mortgage crisis. Yousaf et al. (2018) reported that no significant herding behavior existed in the Pakistani stock market under both high and low volatility. Wu et al. (2020) observed similar findings in the Chinese A-share market during the COVID-19 pandemic, where investors displayed rational behavior despite high market volatility.

Overall, when it comes to uncertainty and herding behavior in financial markets, most studies agree that uncertainty exacerbates herding behavior. This is because uncertainty undermines the efficiency of information transmission, making investment outcomes more unpredictable. In such situations, for investors facing high risks, following the decisions of high-quality investors seems to be an effective way to mitigate risk. However, herding behavior often does not yield positive returns for investors, as it can lead to asset price bubbles (Hott, 2009), which are detrimental to healthy market development. For example, related research shows that herding behavior among fund managers negatively impacts long-term fund returns (Lu et al., 2022) and can amplify the risk of stock price crashes (Deng et al., 2018). In the banking industry, herding behavior can lead to non-performing loans (Uchida and Nakagawa, 2007; Tran et al., 2017), which negatively affects banks' operational performance (Fang et al., 2021). In the stock market, herding behavior can have destabilizing effects on stock prices (Kremer and Nautz, 2013), and in some cases, it can even lead to severe price distortions (Guo et al., 2024).

What characteristics will herding behavior in the venture capital market exhibit under uncertainty, and how will economic policy uncertainty affect herding behavior in this market? These are the core questions addressed in this paper. Intuitively, economic policy uncertainty might exacerbate herding behavior among venture capitalists because information uncertainty and asymmetry are key drivers of herding behavior in the venture capital market (Zhang et al., 2021). Economic policy uncertainty increases information friction in capital markets (Nagar et al., 2019) and exacerbates information asymmetry (Wang et al., 2022), potentially leading to increased herding behavior in the venture capital market. However, the venture capital market, as a significant primary market, differs markedly from stock and fund markets. Firstly, venture capital primarily targets startups or emerging companies, characterized by a "high risk, high return" nature. Unlike stock and mutual fund market investors who prioritize asset stability and liquidity, venture capitalists are typically willing to take on higher risks in exchange for the potential of substantial future returns. While they exhibit "risk aversion," they are more "loss averse" and have a higher tolerance for failure (Chemmanur et al., 2014; Tian and Wang, 2014). Secondly, venture capitalists often display overconfidence in their decision-making (Zacharakis and Shepherd, 2016), with experienced investors being sensitive and rational in responding to public market signals (Gompers et al., 2008). Moreover, investments involve costs, and venture capitalists' decisions are not fully reversible (Xu, 2020). External uncertainty grants inherent option value to investments, making venture capitalists more cautious, slowing down their investment pace, and waiting for uncertainty to dissipate before making decisions (Li, 2008; Huang et al., 2022). Considering these factors, due to the high-risk, high-return nature of the venture capital market, investors' overconfidence, and the irreversibility of decisions from the real options perspective, venture capitalists may not blindly follow others when facing uncertainty. Instead, they might act more cautiously and rationally. From this perspective, economic policy uncertainty may not exacerbate herding behavior in the venture capital market and could even reduce it.

How does economic policy uncertainty affect herding behavior in the venture capital market? To clarify this issue, this paper investigates the impact of economic policy uncertainty on herding behavior in China's venture capital market. As the largest developing country and the world's second-largest economy, China's economic growth rate and scale are remarkable globally. In recent years, China's entrepreneurial and innovation activities have increased significantly, making it a hotspot for venture capital. According

to the Asset Management Association of China, by the end of 2022, there were approximately 19,400 active venture capital funds in China, with a total scale of about 2.9 trillion yuan, growing at rates of 33.4 % and 22.4 %, respectively[1]. Moreover, the Chinese government plays a crucial role in economic activities, and changes in government policy can significantly impact the venture capital market (Chen, 2023). For instance, government support policies for technological innovation, such as initiatives in "Internet+", artificial intelligence, and new energy sectors, have significantly promoted venture capital in these industries. By focusing on China's venture capital market, this study provides valuable insights for other emerging markets and developing countries, helping them to effectively manage the impact of policy uncertainty on investment markets while promoting economic development.

The core hypothesis of this study is that higher levels of economic policy uncertainty (EPU) are associated with weaker herding behavior in the venture capital (VC) market. Specifically, this paper adopts the perspective of venture capital institutions and constructs a panel dataset covering all VC investment events in China from 2002 to 2021, structured at the "VC investor–portfolio company–investment round" level. The measurement of EPU follows the widely used approach developed by Baker et al. (2016), utilizing the monthly China EPU index with further adjustments. To capture herding behavior in the VC market, we adopt an industry-level measure based on the methodology of Zhang et al. (2021). The empirical results reveal a significant negative relationship between EPU and herding in the VC market, suggesting that higher policy uncertainty is associated with a weakening of herding tendencies among venture capitalists.

To ensure the robustness of our conclusions, we altered both the explanatory and dependent variables and conducted a series of robustness checks, with the results remaining unchanged. Regarding endogeneity, we first employed the two-period lagged U.S. economic policy uncertainty as an instrumental variable and applied a two-stage regression to address potential endogeneity issues. Furthermore, following the approaches of Gulen and Ion (2016) and Huang et al. (2022), we used U.S. economic policy uncertainty to further eliminate redundant factors from China's economic policy uncertainty. After conducting a series of robustness and endogeneity tests, we confirm that the negative relationship between economic policy uncertainty and herding behavior in the venture capital market is both valid and robust. This suggests that, unlike in financial markets such as the stock and banking markets, herding behavior in the venture capital market tends to be weaker in periods of higher economic policy uncertainty.

To further explore the channels or mechanisms through which economic policy uncertainty weakens herding behavior in the venture capital market, we propose two possible mechanisms from the perspective of venture capital institutions: investment specialization and risk aversion. Regarding investment specialization, our analysis shows that when economic policy uncertainty is higher, venture capitalists tend to adopt more specialized investment strategies, thereby reducing decision-making costs and mitigating risks. From the perspective of the entire venture capital market, when each investor adopts a specialized investment strategy, herding behavior in the market becomes less pronounced, as investors base their decisions on their accumulated expertise and experience in specific industries rather than imitating or following other investors. Our empirical results also support this finding. As for risk aversion, we construct a risk aversion index by measuring the proportion of investments made by venture capital firms in later-stage companies. Our empirical research indicates a significant positive relationship between economic policy uncertainty and the risk aversion of venture capital firms, while herding behavior in the venture capital market shows a significant negative relationship with investors' risk aversion. In environments of high uncertainty, information asymmetry increases, making it difficult for investors to accurately assess whether the actions of other investors are based on reliable information. Risk-averse investors focus more on the safety and stability of their investments. Therefore, investors with higher risk aversion are more likely to rely on their own expertise and information for independent evaluation rather than blindly following the decisions of others. As a result, they are more likely to make independent decisions, which reduces herding behavior.

Finally, this paper further explores the heterogeneity in the impact of economic policy uncertainty on herding behavior in the venture capital market. Our study mainly focuses on the characteristics of venture capital institutions and startups. The heterogeneity analysis reveals that, compared to domestic venture capital firms, foreign-backed venture capital firms are more strongly affected by economic policy uncertainty in terms of herding behavior. In contrast, government-backed venture capital firms are less affected by economic policy uncertainty than privately-backed firms. Additionally, herding behavior is more significantly reduced in experienced venture capital firms and early-stage startups, which may be related to the cautious strategies employed by venture capital institutions under high economic policy uncertainty.

This study makes several contributions in the following areas: First, it introduces the perspective of behavioral finance into the venture capital field, expanding the research boundary on the impact of economic policy uncertainty (EPU) on investor behavior. Existing literature primarily focuses on the effects of EPU on investment volatility, trading activity, or capital costs. In contrast, this paper finds that, in the venture capital market—which is characterized by long-term investment horizons, information asymmetry, and exit restrictions—EPU has a negative impact on herding behavior, displaying a different response pattern from that of public market investors. Second, this paper identifies the micro-mechanisms through which EPU affects venture capital behavior. It finds that EPU encourages venture capitalists to adopt more specialized investment strategies and strengthens their risk aversion tendencies, leading them to pursue more independent and diversified investment strategies, thereby reducing dependence on others' investment decisions. The reduction in herding behavior reflects investors' shift toward more independent and cautious decision-making pathways when facing uncertainty, driven by considerations of risk control and the difficulty of exit. Finally, from a policy perspective, the venture capital market is a critical channel for technological innovation and the development of emerging industries. VC investment behavior has a significant impact on the efficiency of capital allocation. The results of this paper suggest that an increase in macroeconomic

[1] Data source: Asset Management Association of China, *China Securities Investment Fund Industry Annual Report 2023*, https://www.amac.org.cn/sjtj/tjbg/nb/202403/P020240318532262950902.pdf.

policy uncertainty may inhibit collective following behavior among investors, prompting resources to be distributed across different sectors, helping alleviate technological bubbles and promoting market stability. This finding provides new empirical evidence for understanding how policy expectations influence the allocation of entrepreneurial investment resources.

2. Relation to the existing literature

This paper contributes to two strands of literature. The first is on herding behavior in venture capital. Currently, research on herding behavior in the venture capital market is quite limited. Li et al. (2008) were the first to suggest that herding behavior exists in the venture capital market and developed a game theory model to analyze it. Their study indicated that information asymmetry and the pursuit of reputation by VCs are causes of herding behavior. Additionally, they noted that herding behavior can lead to over-investment in high-tech companies, fueling asset bubbles. However, their research lacked further empirical analysis and causal inference. Zhang et al. (2021) provided the first empirical evidence for the existence and causes of herding behavior in venture capital. By measuring investment imbalances across industries, they constructed an index for herding behavior in venture capital and demonstrated its existence in the Chinese market. They empirically identified two main drivers of herding behavior: positive signals from fundamental markets and information uncertainty. Furthermore, they pointed out that herding behavior negatively impacts the exit performance of VCs. By using their method of measuring herding behavior and conducting further empirical research, this paper helps enrich the literature on herding behavior in venture capital.

Secondly, this paper contributes to the literature on the impact of uncertainty on venture capital investment behavior and performance, which is a well-researched area. Tian et al. (2023) explored how policy uncertainty, arising from gubernatorial elections in the United States, affects the venture capital market. Their research indicates that policy uncertainty leads to negative effects, such as reduced investment numbers, increased liquidity risk, and decreased investment amounts. Nevertheless, investors with strategic motives who prefer early-stage high-tech startups can withstand these negative impacts, a phenomenon that can be explained by real options theory. Bar-Ilan and Strange (1996) pointed out that if an investment takes a long time to complete, uncertainty can positively affect investment because the invested company can terminate the investment when uncertainty continues to increase, with losses being certain and limited. This option to exit can be seen as exercising a put option, whereas if conditions improve, the potential profits are unlimited. Thus, uncertainty adds intrinsic option value to the investment. The option value theory of venture capital provides a theoretical basis for many studies. For example, Huang et al. (2022) demonstrated that economic policy uncertainty leads venture capitalists to adopt a "wait-and-see" approach, slowing their investment pace, as waiting for uncertainty to dissipate increases the investment's value. However, this suppressive effect is not significant in highly competitive and high-tech industries because venture capitalists seek to secure first-mover advantages in investments.

Regarding economic policy uncertainty and venture capital investment strategies, Yi et al. (2022) found that economic policy uncertainty can lead VCs to adopt more specialized strategies concerning investment stage, industry, and phases. From this perspective, investors perceive economic policy uncertainty more as a risk, prompting venture capitalists to exhibit cautious behavior under uncertainty. Li and Chi (2013) focused on the impact of uncertainty on venture capitalists' divestment tendencies, showing that uncertainty negatively affects their inclination to divest. Portfolio diversification exacerbates this negative effect, while portfolio specialization can mitigate the negative impact of uncertainty on divestment tendencies. These studies provide evidence that venture capitalists adopt specialized investment strategies under uncertainty. This paper views investment specialization as one of the key mechanisms through which economic policy uncertainty weakens herding behavior in venture capital. When economic policy uncertainty is high, investors become more cautious and rational, enhancing the degree of investment specialization, thereby reducing herding behavior in the market.

This paper investigates the impact of economic policy uncertainty on herding behavior in the venture capital market, from the perspective of venture capital institutions. Essentially, it also examines the investment behaviors and strategies of venture capital institutions under uncertainty. The contribution of this paper lies in its pioneering integration of economic policy uncertainty and herding behavior in the venture capital market, providing a fresh perspective for research on venture capital under the lens of uncertainty. Furthermore, this paper focuses on the behavioral finance issue of whether investors' decisions converge, identifying whether venture capital institutions are more likely to follow market trends or exhibit more independent investment strategies when facing uncertainty. By constructing an industry-quarter-level herding behavior index and incorporating mechanism variables such as investment specialization and risk aversion, this paper offers a more detailed behavioral characterization of venture capitalists' investment decision-making under uncertainty. It also provides a theoretical foundation and empirical support for future research on how uncertainty affects the allocation of innovative capital.

3. Research design

3.1. Data source and sample selection

This paper uses all venture capital financing events in the Chinese market from January 1, 2002, to December 31, 2021, as the initial research sample. Venture capital-related information is primarily sourced from the Zero2IPO database, and macroeconomic data is obtained from the CSMAR database. The venture financing events are processed as follows: First, information regarding the characteristics of VCs, such as the establishment time and location, is supplemented from the Zero2IPO Institutional Data Sub-database, and only the investment event data samples with PE and VC institution types are retained. Second, the characteristic indicator variables related to VCs and startups are calculated. Finally, the economic policy uncertainty index and herding effect values

are matched to the corresponding investment events, resulting in a sample with dimensions of "economic policy uncertainty - herding behavior - VCs - investee enterprises - other related variables."

3.2. Variable definitions

3.2.1. Measurement of herding behavior in venture capital

Zhang et al. (2021) constructed a herding behavior index for the venture capital market by adapting the LSV method (Lakonishok et al., 1992), which is used to measure herding behavior in the stock market. Zhang et al. (2021) pointed out that information in the venture capital market is usually not publicly disclosed and may only be available at exit events (such as IPOs or mergers and acquisitions). Additionally, there are inherent exit restrictions in the venture capital market, and the lower trading frequency compared to secondary markets means that herding behavior in venture capital often does not manifest at the company level. Instead, venture capitalists make investment decisions based on industry prospects, and the preference of VCs for high-tech startups supports this. Therefore, herding behavior in venture capital is mainly concentrated at the industry level.

Specifically, based on the industry classification in the Zero2IPO database, we merge industries with similar characteristics and categorize the industries of the invested companies into ten types: telecommunications-related industries, semiconductor and electronic equipment-related industries, machinery manufacturing-related industries, clean technology-related industries, finance-related industries, entertainment and media-related industries, biotechnology and healthcare-related industries, computer-related industries, internet-related industries, and other industries not included in the above categories. Considering the relatively low frequency of venture capital transactions, the investment characteristics of venture capital institutions may be more apparent over a longer time span. Therefore, this paper examines herding behavior at the quarterly level. The herding behavior index for industry i in the quarter t is calculated as follows:

$$Herd_{i,t} = \left| pb_{i,t} - E[pb_t] \right| - E\left[\left| pb_{i,t} - E[pb_t] \right| \right] \tag{1}$$

In the formula, $pb_{i,t}$ represents the ratio of the new venture capital investment in industry i during quarter t to the cumulative venture capital investment in industry i, i.e., the investment growth rate for industry i in quarter t. $E[pb_t]$ is the average growth rate of the venture capital market in quarter t, which is measured by the overall investment growth rate in the venture capital market. The first term in the formula essentially measures the imbalance in venture capital investment growth across industries. The second term represents the adjustment factor, where, following the approach of Uchida and Nakagawa (2007) and Zhang et al. (2021), the average value of $\left| pb_{i,t} - E[pb_t] \right|$ is subtracted by 1.96 standard deviations to construct the herding behavior index. This model essentially implies that herding behavior is considered to exist in an industry only when the imbalance in investment growth within that industry reaches a certain threshold.

In the subsequent analysis, we use the original values of *Herd* as a measure of the intensity of herding behavior for OLS regression. At the same time, we define a dummy variable for herding behavior, *Herd_dummy*, based on whether *Herd* is greater than 0, and use Probit regression to examine the impact of economic policy uncertainty (EPU) on the probability of herding behavior occurring.

3.2.2. Measurement of economic policy uncertainty

This paper uses the monthly economic policy uncertainty index for China developed by Baker et al. (2016) to measure the degree of economic policy uncertainty. This index is constructed based on the frequency of news reports in the Hong Kong South China Morning Post (SCMP). The specific method is as follows: First, using automated search and audit research methods, articles containing the terms "China/Chinese," "economy/economic," and "uncertainty/uncertain" are identified, and these articles are required to discuss policy matters (e.g., policy, spending, budget, politics, interest rates, or reform). Then, the monthly frequency of SCMP articles related to China's economic policy uncertainty is calculated and divided by the total number of SCMP articles for that month to obtain a relative frequency. Finally, the time series data is normalized to have an average value of 100 over the period from 1985 to 2012.

To match the venture capital herding behavior data, this paper follows the methods of Gulen and Ion (2016) and Baker et al. (2016) to convert the monthly economic policy uncertainty into a quarterly China economic policy uncertainty index. Specifically, this involves calculating a simple arithmetic average by summing the monthly EPU for a given quarter and dividing it by 3. Considering the regression coefficient values, the resulting EPU is then standardized by dividing it by 1000.

3.2.3. Mechanism variables

(1) Investment specialization.

We measure the investment specialization of VCs by the degree of industry concentration in their investments. Referring to the studies by Gompers et al. (2009) and Buchner et al. (2017), we use the Herfindahl-Hirschman Index (HHI) to calculate the level of investment specialization. The specific formula is as follows:

$$Focus_t = \sum_{i=1}^{N} \left(X_{i,t} / X_t \right)^2 \tag{2}$$

For a given venture capital institution, $Focus_t$ represents the level of investment specialization for that venture capital institution in quarter t. X_t is the total number of venture capital events (or amount) conducted by the institution in quarter t, while $X_{i,t}$ represents the number of venture capital events (or amount) conducted by the institution in industry i during quarter t. $X_{i,t}/X_t$ represents the percentage of investment events (or amount) in industry i for that institution in quarter t. N is the number of industries in which the

venture capital institution made investments in quarter *t*. The value of $Focus_t$ ranges from 0 to 1, with higher values indicating a more concentrated distribution of investment events, thus a higher degree of investment specialization.

(2) Risk aversion.

Gompers and Lerner (2001) point out that venture capitalists face very high risks when investing in early-stage companies because these companies' business models and market acceptance have not yet been validated. In contrast, investing in growth-stage or mature companies involves lower risk, as these companies have already gained market recognition. Many existing studies use the proportion of investment in early-stage companies to measure the risk-taking level of venture capital institutions (Chaplinsky and Gupta-Mukherjee, 2016). This paper, however, uses the proportion of investment events and amounts in later-stage companies to measure the risk aversion level of venture capital institutions (*Riskaversion*). Specifically, the Zero2IPO database classifies the development stages of startups into seed, startup, expansion, and maturity phases. We consider companies in the expansion or maturity stages at the time of investment as low-risk portfolio companies. The risks and uncertainties associated with investing in these companies are relatively low, so we argue that the higher the proportion of investments in later-stage companies, the higher the risk aversion of the venture capital institution.

3.2.4. Control variables

Based on existing literature (e.g., Sørensen, 2007; Fu et al., 2023), we consider the characteristics of VCs, the characteristics of portfolio companies, and macroeconomic factors in our regression analysis.

(1) Characteristics of VCs

① VC's Professional Qualification: The variable "professional qualification" (*exp*) was proposed by Sørensen (2007) as a measure of venture capital experience and qualifications from an ex-post perspective. It represents the cumulative number of investments made by a VC at the time of a particular investment. *exp* indicates the investment experience and strength of the VC and is one of the key factors influencing their investment decisions.

② Whether the VC Has a Foreign Background: *statedum* is a dummy variable indicating whether the VC has a foreign background. If $statedum = 1$, the firm has a foreign or mixed background; otherwise, it is considered entirely domestic, with $statedum = 0$.

③ Whether the VC Has a Government Background: *gov* is a dummy variable indicating whether the VC has a government background. If $gov = 1$, the firm has a government background; otherwise, it is considered non-governmental, with $gov = 0$.

④ Whether the VC and the Portfolio Company Are Located in the Same Region: *distance* is a dummy variable indicating whether the VC and the portfolio company are in the same region. If $distance = 1$, both parties are in the same province or municipality; otherwise, they are considered to be in different locations, with $distance = 0$.

(2) Characteristics of portfolio companies

① Development Potential of Portfolio Companies: Fu et al. (2019) pointed out that there is a "matching" relationship between VCs and portfolio companies, meaning "good VCs" prefer to invest in "good companies," and "good companies" prefer to accept investment from "good VCs." Since portfolio companies are not publicly listed, it is not possible to measure their performance and attractiveness to VCs using specific financial data. This paper adopts the approach of Fu et al. (2019) by using the total number of venture capital rounds a portfolio company has received throughout the sample period as a measure of its development potential, denoted as *turnnums*.

② Development Stage of the Portfolio Company When Receiving Venture Capital: According to the Zero2IPO classification, $stagesetup = 1$ indicates that the portfolio company is in the seed or startup phase, $stageexpand = 1$indicates the expansion phase, and $stagemature = 1$ indicates the maturity phase.

③ Whether the Portfolio Company Is in Series A Financing When Receiving Venture Capital: $turnA = 1$ indicates that the portfolio company is in Series A financing when receiving investment; otherwise, the value is 0.

In addition, according to the industry classification in the Zero2IPO database, industries with similar characteristics are merged into ten categories. The variables are defined as follows: $I\_telecom = 1$ for telecommunications-related industries, $I\_electron = 1$ for semiconductor and electronic equipment-related industries, $I\_machine = 1$ for machinery manufacturing-related industries, $I\_cleantech = 1$ for clean technology-related industries, $I\_finance = 1$ for finance-related industries, $I\_enterta = 1$ for entertainment and media-related industries, $I\_biomedicine = 1$ for biotechnology and healthcare-related industries, $I\_computer = 1$ for computer-related industries, $I\_internet = 1$ for internet-related industries, $I\_other = 1$ for industries not included in the above categories.

(3) Macroeconomic and external market factors

Since the core explanatory variable EPU (economic policy uncertainty) is a time series variable, controlling for time fixed effects in the model would cause collinearity issues and absorb EPU's explanatory power (Gulen and Ion, 2016). Therefore, this study does not control for time fixed effects in the model. To minimize the problem of omitted variables, a series of macroeconomic and external market factors are added as control variables at the time level:

① Economic Growth (*GDPrate*): Specifically, the quarterly growth rate of China's Gross Domestic Product.

② Money Supply (*M2growth*): Specifically, the quarterly growth rate of China's broad money supply.

③ Stock Market Growth (*stock_rate*): Specifically, the quarterly growth rate of the Shanghai and Shenzhen stock market indices in China, multiplied by 100.

④ Stock Market Volatility (*MarketVolatility*): The standard deviation of the total market capitalization of the Shanghai and Shenzhen stock markets in China during the quarter.

⑤ Dummy Variable for IPO Market Suspension (*IPOstopdate*): If an investment event occurs during an IPO suspension period, then $IPOstop = 1$; otherwise, $IPOstopdate = 0$.

The specific variable definitions are shown in Table 1.

4. Empirical results analysis

4.1. Descriptive statistics

We excluded samples with missing values for the variables and winsorized all continuous variables at the 1 % and 99 % levels to minimize the impact of outliers. This resulted in a final sample of 62,327 venture capital events, which were used for the analysis. Descriptive statistics for the relevant variables are shown in Table 2. As we can see, the mean value of the dummy variable for herding behavior (*Herd_dummy*) is 0.5557, indicating that 55.57 % of industries in the venture capital market experienced herding behavior during the sample period under our setting. Additionally, regarding the intensity of herding behavior, the mean of herding behavior in the venture capital market (*Herd*) is 0.0397, with a minimum value of −0.0227 and a maximum value of 0.6699. These data suggest that herding behavior is widespread in the venture capital market, and there is considerable variation in herding behavior across industries. The minimum value of *EPU* is 0.0502 and the maximum value is 0.8658, indicating significant fluctuations in economic policy uncertainty during the study period (2002Q1−2021Q4). In terms of the characteristics of venture capital institutions, the

Table 1
Variable definitions.

Variable Name	Variable Symbol	Variable Calculation Method
Herding behavior in venture capital	Herd	Calculated using formula (1).
	Herd_dummy	Set to 1 when Herd >0, otherwise set to 0
Economic policy uncertainty	EPU	Quarterly indicator, the arithmetic average of the monthly index of China's economic policy uncertainty
Professional qualifications of the VC	exp	The number of investments accumulated by the VC at the time of the current investment event.
Foreign background of the VC	statedum	Whether the VC has a foreign or mixed background, 1 for yes, 0 for no
Government background of the VC	gov	Whether the VC has a government background, 1 for yes, 0 for no
Whether the VC and the invested company are in the same region	distance	Whether the VC and the invested company are located in the same province or municipality, 1 for yes, 0 for no
Development potential of the invested company	turnnums	Total number of venture capital investments received by the invested company during the entire sample period
Development stage of the invested company	stagesetup	Whether the invested company is in the seed or startup stage when receiving investment, 1 for yes, 0 for no
	stageexpand	Whether the invested company is in the expansion stage when receiving investment, 1 for yes, 0 for no
	stagemature	Whether the invested company is in the maturity stage when receiving investment, 1 for yes, 0 for no
Financing round of the invested company	turnA	Dummy variable for whether the invested company is in Series A financing when receiving venture capital, 1 for yes, 0 for no
Macroeconomics and external markets	GDPrate	Quarterly growth rate of China's Gross Domestic Product
	M2growth	Quarterly growth rate of China's broad money supply
	stock_rate	Quarterly growth rate of the Shanghai and Shenzhen stock market indices in China, multiplied by 100
	MarketVolatility	The standard deviation of the total market capitalization of the Shanghai and Shenzhen stock markets in China
	IPOstopdate	Whether the investment event occurred during an IPO suspension period, 1 for yes, 0 for no.
Investment specialization	Focus1	Investment specialization measured by the number of investment events
	Focus2	Investment specialization measured by the amount of investment events
Degree of Risk aversion	Riskaversion1	Quarterly proportion of investment events in mid-to-late stage companies by venture capital institutions.
	Riskaversion2	Quarterly proportion of investment amount in mid-to-late stage companies by venture capital institutions.
Industry of the entrepreneurial firms	I_telecom	Dummy variable for telecommunications-related industries
	I_electron	Dummy variable for semiconductor and electronic equipment-related industries
	I_machine	Dummy variable for machinery manufacturing-related industries
	I_cleantech	Dummy variable for clean technology-related industries
	I_finance	Dummy variable for finance-related industries
	I_enterta	Dummy variable for entertainment and media-related industries
	I_biomedicine	Dummy variable for biotechnology and healthcare-related industries
	I_computer	Dummy variable for computer-related industries
	I_internet	Dummy variable for internet-related industries
	I_other	Dummy variable for all other industries

Table 2
Descriptive statistics.

	N	Mean	SD	Min	Max
Herding behavior variable (*N* = 781)					
Herd	781	0.0397	0.1105	−0.0227	0.6699
Herd_dummy	781	0.5557	0.4972	0	1
Quarterly-level variable (*N* = 80)					
EPU	80	0.2507	0.2272	0.0502	0.8658
GDPrate	80	0.3347	0.6912	−0.7919	1.2100
M2growth	80	0.0346	0.0178	−0.0062	0.1167
stock_rate	80	2.7526	15.5111	−29.4794	43.7546
MarketVolatility	80	14,312.7059	12,486.6635	203.5897	58,071.6883
Investment event variable (*N* = 62,327)					
exp	62,327	43.6583	103.2545	1	853
statedum	62,327	0.1603	0.3668	0	1
gov	62,327	0.3318	0.4709	0	1
distance	62,327	0.3743	0.4839	0	1
turnnums	62,327	6.3364	6.6388	1	50
stagesetup	62,327	0.3165	0.4651	0	1
stageexpand	62,327	0.4172	0.4931	0	1
stagemature	62,327	0.2663	0.4420	0	1
turnA	62,327	0.3390	0.4734	0	1
IPOstopdate	62,327	0.0857	0.2800	0	1
Focus1	62,327	0.7259	0.3107	0.1243	1.0000
Focus2	62,327	0.7880	0.2655	0.1598	1.0000
Riskaversion1	62,327	0.6836	0.3924	0.0000	1.0000
Riskaversion2	62,327	0.7038	0.4009	0.0000	1.0000

minimum value of investment experience (*exp*) is 1, the maximum value is 853, and the standard deviation is 103.2545, reflecting considerable differences in the professional qualifications of venture capital institutions. Furthermore, in the sample of venture capital events, the market shows a preference for investing in companies in the expansion stage (*stageexpand*), with 41.72 % of investments made in these companies, followed by those in the startup stage (*stagesetup*) at 31.65 %, and finally, those in the maturity stage (*stagemature*) at 26.63 %.

4.2. Baseline results

To investigate the impact of economic policy uncertainty on herding behavior in the venture capital market, we designed the following model for the baseline regression analysis:

$$\Pr\left(Herd\_dummy_{i,t}=1\right)=\Phi\left(\alpha+\beta_1 lag\_EPU+\gamma_1 Controls+\gamma_2 Macro+industry+province+\varepsilon\right) \tag{3}$$

$$Herd_{i,t}=\alpha+\beta_2 lag\_EPU+\gamma_3 Controls+\gamma_4 Macro+industry+province+\varepsilon \tag{4}$$

In this model, $Herd\_dummy_{i,t}$ is a dummy variable indicating whether herding behavior occurred in industry i during quarter t. $Herd_{i,t}$ represents the herding behavior intensity value for industry i in quarter t. *lag_EPU* refers to the level of economic policy uncertainty from the previous quarter. Following the approach of Wang et al. (2014), we use the previous period's economic policy uncertainty as the core explanatory variable. Given that venture capital investment decisions typically involve some delays in information processing, evaluation, and decision-making, the lagged treatment helps mitigate potential reverse causality issues, preventing changes in the venture capital market from influencing the measurement of economic policy uncertainty. *Controls* refers to control variables at the investment event level, which include a range of characteristics of the venture capital institutions and the invested companies. *Macro* represents the macroeconomic and external market factors for quarter *t*. Since controlling for time fixed effects could lead to collinearity, we did not include time dummy variables but instead controlled for a series of macroeconomic and external market variables. Additionally, we control for industry (*industry*) and province (*province*) fixed effects. Finally, to minimize errors related to the synchronization of investment behavior within industries or quarters, we used two-dimensional clustering—by quarter (*quarter*) and industry (*industry*)—to estimate robust standard errors.

Table 3 presents the baseline regression results for the impact of economic policy uncertainty on herding behavior. Columns (1) and (2) show the results of the Probit model regression, while columns (3) and (4) present the results of the OLS regression. Columns (1) and (3) include only the core explanatory variables and control for industry and province effects; columns (3) and (4) also control for the characteristics of venture capital institutions and invested companies, as well as all control variables, including macroeconomic and market factors. In the results from columns (1) to (4), the core explanatory variable, *lag_EPU*, is significantly negative at the 1 % level, indicating that herding behavior in the venture capital market weakens as economic policy uncertainty increases. Our baseline regression results validate the previous discussion on venture capitalists' decision-making behavior, showing that, under higher

Table 3
EPU and herding behavior in venture capital.

	Herd_dummy *Probit*		Herd *OLS*	
	(1)	(2)	(3)	(4)
lag_EPU	−1.491***	−1.395***	−0.056***	−0.051***
	(0.533)	(0.500)	(0.013)	(0.010)
ln(exp)		−0.009		−0.001**
		(0.011)		(0.001)
statedum		0.058		0.011**
		(0.065)		(0.004)
gov		0.028		0.003**
		(0.026)		(0.001)
distance		0.012		−0.000
		(0.019)		(0.001)
ln(turnnums)		0.018		0.000
		(0.020)		(0.001)
stagesetup		0.007		0.001
		(0.049)		(0.003)
stageexpand		−0.015		−0.000
		(0.052)		(0.002)
turnA		0.020		0.002
		(0.036)		(0.001)
GDPrate		0.015		−0.002
		(0.166)		(0.007)
M2growth		2.600		−0.019
		(5.682)		(0.196)
stock_rate		−0.010		−0.001
		(0.010)		(0.000)
MarketVolatility		0.000		0.000
		(0.000)		(0.000)
IPOstopdate		−0.097		0.000
		(0.221)		(0.009)
Constant	0.652**	0.511	0.027***	0.017
	(0.283)	(0.375)	(0.006)	(0.012)
Observations	62,327	62,327	62,327	62,327
R^2	0.076	0.085	0.084	0.104
R^2-Adj.	0.075	0.083	0.083	0.103
Industry	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
Clustered by quarter and industry	Yes	Yes	Yes	Yes

Note: Standard errors are reported in parentheses underneath estimated coefficients. *, **, and *** indicate significance at the 10 %, 5 %, and 1 % levels, respectively.

economic policy uncertainty, investors do not blindly follow others but instead act more cautiously, thereby reducing the probability and intensity of herding behavior at the industry level.

4.3. Robustness tests

4.3.1. Change in core explanatory variable

(1) Using the EPU lagged by two periods: This paper further employs the economic policy uncertainty (EPU) index lagged by two periods as the core explanatory variable. This approach aims to test the sensitivity of the results to the lag setting and ensures that the conclusions of the paper are not dependent on a specific one-period lag setting. Given that the venture capital decision-making process may involve longer information transmission and decision cycles, using a two-period lag can capture the impact of more distant macroeconomic policy uncertainty shocks on investment behavior, thereby enhancing the robustness of the results. The regression using the two-period lagged EPU is shown in Table A1 in the Appendix, the negative relationship between herding behavior and EPU remains significant.

(2) Replacing the Measure of Economic Policy Uncertainty: Davis et al. (2019) constructed the China Economic Policy Uncertainty Index (DVEPU) based on the method of Baker et al. (2016), using two authoritative Chinese mainland newspapers, *People's Daily* and *Guangming Daily*. Compared to the index constructed by Baker et al. (2016) based on the *South China Morning Post* from Hong Kong, the DVEPU index based on two mainland Chinese newspapers may more accurately reflect the overall economic policy uncertainty in China. This paper adopts the DVEPU index to remeasure economic policy uncertainty, and using the same processing method, we calculate the arithmetic average and divide by 1000 to convert the monthly index into a quarterly index, DVEPU, and use the lagged one-period variable, *lag_DVEPU*, for regression. The results of the revised regression are shown in

Table A2 in the Appendix, confirming that the negative association between herding behavior and EPU remains statistically significant.

4.3.2. Change in the dependent variable

(1) Replacing the Adjustment Term in the Herding Behavior Measure: In the baseline regression, the adjustment term in the herding behavior calculation formula, $E\left[\left|pb_{i,t} - E[pb_t]\right|\right]$, is the mean of the first term $\left|pb_{i,t} - E[pb_t]\right|$ minus 1.96 standard deviations. Referring to the approach of Zhang et al. (2021), we directly modify the adjustment term to the mean of the first term $\left|pb_{i,t} - E[pb_t]\right|$ and recalculate the herding behavior values, *Herd*1 and *Herd*1_*dummy*. The results of the revised regression are shown in Table A3 in the Appendix. The negative association between herding behavior and EPU continues to be statistically significant.

(2) Measuring herding behavior using the overall market's investment concentration: To further test the robustness of the conclusions, this paper uses the Herfindahl-Hirschman Index of investment amount at the industry level in the overall venture capital market (*HHI_amount*) as the dependent variable, replacing the original herding behavior indicator based on industry investment growth anomalies. *HHI_amount* reflects the concentration of investment distribution across industries, with higher values indicating that investments are more concentrated in a few industries, demonstrating the aggregated nature of market investment behavior. Since herding behavior in venture capital can lead to excessive concentration of funds in specific industries, *HHI_amount* can serve as an alternative measure of herding behavior. We performed the regression analysis using this alternative indicator, and the results (shown in Table A4 of the Appendix) remain significant.

4.4. Endogeneity

4.4.1. Two-stage regression with instrumental variables

Following the approach of Wang et al. (2014), this paper uses the U.S. economic policy uncertainty lagged by two periods as an instrumental variable and applies a two-stage regression to address potential endogeneity issues. As of 2023, China's total exports to the U.S. reached $501.22 billion[2], making it the largest source of U.S. imports. At the same time, China is the third-largest export market for the U.S., following Canada and Mexico[3]. Given the important economic and trade relationship between China and the U.S., theoretically, U.S. economic policy uncertainty affects China's economic policy uncertainty, but it does not directly affect China's venture capital market, thus meeting the relevance and exogeneity requirements for the instrumental variable. Moreover, to better satisfy the exclusion restriction of the instrumental variable, this paper uses the U.S. EPU lagged by two periods (*lag*2_*USPEU*). The lagged U.S. EPU mainly reflects earlier levels of policy uncertainty in the U.S., and as time progresses, its direct impact on China's venture capital market investment decisions in the current quarter significantly weakens. Therefore, *lag*2_*USPEU* better meets the exogeneity requirement of the instrumental variable, as it influences China's venture capital behavior indirectly through its effect on China's EPU, without directly affecting the number and amount of investments in China's venture capital market. Specifically, this paper uses the U.S. economic policy uncertainty index (USEPU) constructed by Baker et al. (2016) as an instrumental variable for China's economic policy uncertainty index. The monthly USEPU is processed in the same way, averaged to obtain the quarterly *USPEU*, then divided by 1000 and lagged to obtain *lag*2_*USPEU*. A weak instrument test for the instrumental variable shows that *lag*2_*USPEU* is significantly correlated with the original explanatory variable, meeting the relevance requirement for the instrumental variable.

The results of the two-stage instrumental variable regression are shown in Table 4. Columns (1) and (2) present the first-stage and second-stage regression results, respectively. From the first-stage regression, the coefficient of *lag*2_*USEPU* is significantly positive at the 1 % level. From the second-stage regression, the coefficient of $\widehat{lag\_EPU}$ is significantly negative at the 1 % level, and the negative relationship between economic policy uncertainty and herding behavior remains unchanged.

4.4.2. Eliminating economic shocks

We focus on the impact of economic policy uncertainty on the venture capital market, with the emphasis on policy uncertainty. However, economic policy uncertainty may also include economic shocks or other broader shocks (Gulen and Ion, 2016; Huang et al., 2022), meaning potential economic fluctuations and other factors might introduce measurement errors in the EPU index. To exclude factors unrelated to policy uncertainty from the economic policy uncertainty index, we follow the method of Huang et al. (2022) and construct the following model:

$$EPU_m = \alpha + \beta_1 USEPU_m + B_2 MarketVlaue_m + \beta_3 M2Growth_m + \beta_4 ECI_m + year + \varepsilon_m \tag{5}$$

Where EPU_m and $USEPU_m$ are the monthly indices of China's and the U.S.'s economic policy uncertainty, respectively, constructed by Baker et al. (2016). $MarketValue_m$ is the natural logarithm of the monthly total market capitalization of China's stock market. $M2growth_m$ is the monthly growth rate of China's M2 (broad money supply). ECI_m is China's macroeconomic consensus index. Additionally, we control for time fixed effects *year*. The residuals ε_m from the regression eliminate the economic fluctuations and other shocks originally embedded in EPU, thereby more clearly and exogenously reflecting China's economic policy uncertainty. The

[2] Data Source: The U.S.-China Business Council, "U.S. Exports to China 2024," https://www.uschina.org/reports/us-exports-china-2024.
[3] Data Source: The U.S.-China Business Council, "U.S.-China Trade Agenda," https://www.uschina.org/reports/us-china-trade-agenda.

Table 4
Two-stage regression results with instrumental variables.

	First stage (1)	2SLS (2)
$\widehat{lag\_EPU}$		−0.077***
		(0.021)
lag2_USEPU	2.050***	
	(0.407)	
ln(exp)	0.004	−0.001*
	(0.002)	(0.001)
statedum	−0.036***	0.010*
	(0.011)	(0.004)
gov	0.001	0.003**
	(0.006)	(0.001)
distance	−0.004	−0.000
	(0.003)	(0.001)
ln(turnnums)	0.006	0.001
	(0.004)	(0.001)
stagesetup	0.005	0.001
	(0.007)	(0.003)
stageexpand	0.000	0.000
	(0.006)	(0.002)
turnA	−0.050***	−0.000
	(0.012)	(0.002)
GDPrate	−0.032	−0.004
	(0.036)	(0.007)
M2growth	−2.515	−0.138
	(1.421)	(0.226)
stock_rate	0.003	−0.000
	(0.002)	(0.000)
MarketVolatility	0.000	0.000
	(0.000)	(0.000)
IPOstopdate	−0.114**	−0.004
	(0.048)	(0.010)
Constant	0.151	0.033*
	(0.102)	(0.016)
Observations	62,327	62,327
R^2	0.539	0.097
R^2 -Adj.	0.539	0.097
Industry	Yes	Yes
Province	Yes	Yes
Clustered by quarter and industry	Yes	Yes
F Statistic		38,292.5***
Wu-Hausman		271.9***

Note: Standard errors are reported in parentheses underneath estimated coefficients. *, **, and *** indicate significance at the 10 %, 5 %, and 1 % levels, respectively.

monthly ε_m is averaged, divided by 1000, and lagged to obtain the quarterly-level indicator, *lag_EPU_R*. The regression results are shown in Table A5 in the Appendix, where the negative relationship between EPU and herding behavior remains significantly negative.

5. Analysis of influencing mechanisms

5.1. Investment specialization

We first examine the impact of economic policy uncertainty (EPU) on the investment specialization behavior of venture capital institutions. The results are shown in Table 5, columns (1) and (4). Under rising EPU, venture capitalists are more likely to focus on areas they are familiar with, and their investment behavior exhibits a higher degree of specialization. As pointed out by Norton and Tenenbaum (1993), specialization helps venture capitalists gain informational advantages, build reputations, and more effectively control investment risks. In the context of increased uncertainty, venture capital institutions generally tend to deepen their focus on familiar areas, leveraging their existing knowledge base to enhance decision-making abilities and reduce potential risks.

Given that adjustments in investment strategies often exhibit some lag, to more effectively identify the mechanism, this paper further adopts the previous period's investment specialization indicators (i.e., *lag_Focus*1 and *lag_Focus*2) to analyze their impact on current herding behavior. The results are presented in columns (2), (3), (5), and (6) of Table 5. Whether measured by the number of investment events or investment amount, the lagged investment specialization is significantly negatively correlated with herding behavior. This result suggests that the specialized strategies formed by venture capital institutions in response to EPU shocks may weaken herding behavior in subsequent stages by enhancing investment independence and reducing homogeneous choices. Specialized investments lead different institutions to focus on different sectors, which, in turn, weakens path dependence and imitation

Table 5
Using US economic policy uncertainty to mitigate endogeneity concerns.

	Focus1	Herd_dummy *Probit*	Herd *OLS*	Focus2	Herd_dummy *Probit*	Herd *OLS*
	(1)	(2)	(3)	(4)	(5)	(6)
EPU	0.161***			0.126***		
	(0.022)			(0.018)		
lag_Focus1		−0.242**	−0.011**			
		(0.099)	(0.003)			
lag_Focus2					−0.230**	−0.012***
					(0.098)	(0.004)
ln(exp)	−0.119***	−0.051**	−0.003***	−0.097***	−0.044**	−0.003***
	(0.003)	(0.021)	(0.001)	(0.003)	(0.019)	(0.001)
statedum	0.022	0.127*	0.013**	0.023*	0.126*	0.013**
	(0.012)	(0.066)	(0.004)	(0.012)	(0.066)	(0.004)
gov	−0.019**	0.027	0.002*	−0.017*	0.027	0.002*
	(0.008)	(0.031)	(0.001)	(0.008)	(0.031)	(0.001)
distance	0.009**	0.020	0.000	0.007*	0.020	0.000
	(0.004)	(0.029)	(0.002)	(0.003)	(0.028)	(0.002)
ln(turnnums)	0.008***	0.007	0.000	0.009***	0.007	0.000
	(0.002)	(0.026)	(0.001)	(0.002)	(0.026)	(0.001)
stagesetup	−0.002	0.031	0.002	0.003	0.032	0.002
	(0.007)	(0.049)	(0.002)	(0.006)	(0.049)	(0.002)
stageexpand	0.003	−0.036	−0.000	0.002	−0.036	−0.000
	(0.006)	(0.049)	(0.002)	(0.006)	(0.050)	(0.002)
turnA	−0.011***	0.112**	0.005**	−0.013***	0.113**	0.005**
	(0.003)	(0.052)	(0.002)	(0.004)	(0.052)	(0.002)
GDPrate	−0.001	0.098	0.001	−0.002	0.098	0.001
	(0.008)	(0.165)	(0.006)	(0.007)	(0.165)	(0.006)
M2growth	−0.142	8.723	0.205	−0.200	8.777	0.206
	(0.243)	(5.725)	(0.187)	(0.221)	(5.738)	(0.187)
stock_rate	0.000	−0.014	−0.001	−0.000	−0.014	−0.001
	(0.001)	(0.012)	(0.000)	(0.001)	(0.012)	(0.000)
MarketVolatility	−0.000	0.000	0.000	−0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IPOstopdate	0.029	0.126	0.009	0.031*	0.126	0.009
	(0.019)	(0.212)	(0.009)	(0.014)	(0.212)	(0.009)
Constant	0.983***	−0.018	−0.002	0.987***	−0.041	−0.001
	(0.019)	(0.211)	(0.011)	(0.017)	(0.208)	(0.011)
Observations	62,327	49,396	49,396	62,327	49,396	49,396
R^2	0.454	0.054	0.082	0.401	0.054	0.082
R^2 -Adj.	0.454	0.052	0.081	0.401	0.052	0.081
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by quarter and industry	Yes	Yes	Yes	Yes	Yes	Yes

Note: Standard errors are reported in parentheses underneath estimated coefficients. *, **, and *** indicate significance at the 10 %, 5 %, and 1 % levels, respectively.

behavior among them. This helps explain the negative mechanism through which EPU affects herding behavior.

5.2. Risk aversion

We further examine the impact of economic policy uncertainty (EPU) on the risk aversion tendencies of venture capital institutions. The results are shown in Table 6, columns (1) and (4). The empirical results indicate that higher EPU is significantly associated with greater risk-averse behavior in venture capital institutions, specifically manifested in an increase in the proportion of investments and investment amounts in later-stage projects. This suggests that, in an uncertain environment, investors tend to prefer relatively stable investment targets.

Given that adjustments in venture capital institutions' portfolios typically exhibit some inertia and strategic continuity, risk aversion, as a behavioral trait, often shows a delayed response in terms of its changes and impact on investment behavior. Therefore, to enhance the validity of mechanism identification, this paper uses the previous period's risk aversion indicators (*lag_Riskaversion*1 and *lag_Riskaversion*2) to measure the potential impact of investors' prior risk preferences on current herding behavior. The results in columns (3), (5), and (6) of Table 6 show that the lagged risk aversion of venture capital institutions is significantly negatively correlated with the intensity of herding behavior in the current venture capital market. This finding may reflect that highly risk-averse investors, when facing market uncertainty, focus more on safety and stability, tending to rely on their own judgments rather than imitating others. As a result, in subsequent stages, they exhibit more independent investment behavior, which weakens the convergence effect in the market.

Table 6
Analysis of Mechanisms: Risk Aversion.

	Riskaversion1	Herd_dummy *Probit*	Herd *OLS*	Riskaversion2	Herd_dummy *Probit*	Herd *OLS*
	(1)	(2)	(3)	(4)	(5)	(6)
EPU	0.027*			0.027*		
	(0.012)			(0.012)		
lag_Riskaversion1		−0.090	−0.005***			
		(0.055)	(0.001)			
lag_Riskaversion2					−0.090**	−0.004***
					(0.045)	(0.001)
ln(exp)	−0.008***	−0.020	−0.002**	0.003	−0.019	−0.002*
	(0.002)	(0.018)	(0.001)	(0.003)	(0.018)	(0.001)
statedum	−0.028***	0.115*	0.012**	−0.017*	0.115*	0.013**
	(0.006)	(0.066)	(0.004)	(0.009)	(0.066)	(0.004)
gov	0.031***	0.038	0.003**	0.025***	0.038	0.003**
	(0.008)	(0.030)	(0.001)	(0.008)	(0.030)	(0.001)
distance	−0.006**	0.018	0.000	−0.004	0.019	0.000
	(0.002)	(0.028)	(0.002)	(0.003)	(0.028)	(0.002)
ln(turnnums)	0.007***	0.008	0.000	0.007***	0.008	0.000
	(0.002)	(0.026)	(0.001)	(0.002)	(0.026)	(0.001)
stagesetup	−0.710***	0.009	0.001	−0.699***	0.009	0.001
	(0.013)	(0.046)	(0.002)	(0.013)	(0.046)	(0.002)
stageexpand	−0.046***	−0.044	−0.001	−0.046***	−0.044	−0.001
	(0.007)	(0.052)	(0.002)	(0.007)	(0.051)	(0.002)
turnA	0.004	0.116**	0.005**	−0.000	0.116**	0.005**
	(0.003)	(0.052)	(0.002)	(0.003)	(0.052)	(0.002)
GDPrate	0.004	0.100	0.001	0.004	0.100	0.001
	(0.003)	(0.165)	(0.006)	(0.004)	(0.164)	(0.006)
M2growth	0.115	8.963	0.215	0.081	8.951	0.215
	(0.127)	(5.767)	(0.186)	(0.127)	(5.761)	(0.186)
stock_rate	−0.000	−0.014	−0.001	−0.000	−0.014	−0.001
	(0.000)	(0.013)	(0.000)	(0.000)	(0.013)	(0.000)
MarketVolatility	0.000	0.000	0.000	−0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IPOstopdate	0.002	0.123	0.009	0.014	0.124	0.009
	(0.004)	(0.213)	(0.009)	(0.009)	(0.213)	(0.009)
Constant	0.931***	−0.228	−0.010	0.918***	−0.228	−0.010
	(0.018)	(0.261)	(0.011)	(0.020)	(0.264)	(0.011)
Observations	62,327	49,396	49,396	62,327	49,396	49,396
R^2	0.725	0.053	0.081	0.649	0.053	0.081
R^2 -Adj.	0.724	0.051	0.080	0.648	0.051	0.080
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by quarter and industry	Yes	Yes	Yes	Yes	Yes	Yes

Note: Standard errors are reported in parentheses underneath estimated coefficients. *, **, and *** indicate significance at the 10 %, 5 %, and 1 % levels, respectively.

6. Heterogeneity in the effects of economic policy uncertainty

6.1. Foreign-backed VCs

Column (1) of Table 7 reports the heterogeneous effect related to whether venture capital institutions have a foreign background. The results show that the coefficient of the interaction term between *lag_EPU* and *statedum* is significantly negative, suggesting a stronger correlation between rising economic policy uncertainty and reduced herding behavior among foreign-backed venture capital firms. This result may be associated with the international experience and informational advantages possessed by foreign-backed VCs. Liu and Maula (2016) point out that venture capital institutions with international experience can more effectively acquire information and manage risks through their global networks when facing uncertainty. Moreover, foreign-backed VCs typically exhibit greater strategic flexibility and adaptability, enabling them to adjust investment behaviors more quickly in response to changes in the policy environment. Therefore, under high EPU conditions, foreign-backed VCs may rely more heavily on their own judgments, making independent investment decisions, and thus exhibiting relatively less herding behavior. This helps explain, to some extent, the heterogeneity in their response to herding behavior under varying EPU conditions.

6.2. Government-backed VCs

Column (2) of Table 7 reports the heterogeneous effect related to whether venture capital institutions have a government background. The results indicate that the coefficient of the interaction term between *lag_EPU* and *gov* is significantly positive, suggesting

Table 7
Heterogeneity in the Effects of EPU.

	Herd			
	(1)	(2)	(3)	(4)
lag_EPU	−0.044***	−0.055***	−0.044***	−0.045***
	(0.009)	(0.011)	(0.009)	(0.009)
lag_EPU × *statedum*	−0.044***			
	(0.013)			
lag_EPU × *gov*		0.010*		
		(0.005)		
lag_EPU × *High_exp*			−0.012**	
			(0.005)	
lag_EPU × *stagesetup*				−0.022**
				(0.008)
ln(exp)	−0.001*	−0.001*	−0.003**	−0.001**
	(0.001)	(0.001)	(0.001)	(0.001)
statedum	0.025***	0.011**	0.011**	0.011**
	(0.007)	(0.004)	(0.004)	(0.004)
gov	0.002**	−0.001	0.002*	0.002*
	(0.001)	(0.002)	(0.001)	(0.001)
distance	−0.000	−0.000	0.000	−0.000
	(0.001)	(0.001)	(0.001)	(0.001)
ln(turnnums)	0.001	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
stagesetup	0.001	0.001	0.001	0.009*
	(0.003)	(0.003)	(0.003)	(0.005)
stageexpand	0.000	0.000	−0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)
turnA	0.002	0.002	0.001	0.002
	(0.001)	(0.001)	(0.001)	(0.001)
GDPrate	−0.002	−0.002	−0.002	−0.002
	(0.007)	(0.007)	(0.007)	(0.007)
M2growth	−0.023	−0.017	−0.034	−0.017
	(0.194)	(0.196)	(0.193)	(0.197)
stock_rate	−0.001	−0.001	−0.001	−0.001
	(0.000)	(0.000)	(0.000)	(0.000)
MarketVolatility	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
IPOstopdate	0.000	0.000	0.000	0.000
	(0.009)	(0.009)	(0.009)	(0.009)
High_exp			0.012***	
			(0.003)	
Constant	0.014	0.019	0.015	0.015
	(0.011)	(0.012)	(0.012)	(0.012)
Observations	62,327	62,327	62,327	62,327
R^2	0.107	0.104	0.105	0.105
R^2 -Adj.	0.106	0.103	0.105	0.104
Industry	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
Clustered by quarter and industry	Yes	Yes	Yes	Yes

Note: Standard errors are reported in parentheses underneath estimated coefficients. *, **, and *** indicate significance at the 10 %, 5 %, and 1 % levels, respectively.

that, compared to privately-backed VCs, the association between rising economic policy uncertainty and reduced herding behavior is weaker among government-backed VCs. This may be related to the greater reliance of government-backed VCs on policy guidance and support from the government (Chen, 2023). When facing higher policy uncertainty, government-backed venture capital institutions might prefer to maintain existing investment strategies rather than quickly adjusting their decisions, awaiting further explicit guidance from the government.

6.3. Experience of VCs

To examine the heterogeneous effect of venture capital institutions' investment experience, we constructed a dummy variable, *High_exp*, based on the cumulative number of investment events by VCs during the sample period. Specifically, *High_exp* equals 1 for venture capital institutions whose cumulative investment experience exceeds the sample median, indicating higher experience; otherwise, it equals 0. Column (3) of Table 7 presents the results of this heterogeneity analysis. The coefficient of the interaction term between *lag_EPU* and *High_exp* is significantly negative, suggesting that the negative association between economic policy uncertainty and herding behavior is more pronounced among experienced venture capital institutions.

This finding aligns with the argument proposed by Chemmanur et al. (2011): experienced venture capitalists tend to be more

rational in information screening and project evaluation. When facing policy uncertainty, they may prefer to make independent decisions based on their own judgment rather than relying heavily on other investors' decisions. In contrast, less experienced investors are more likely to be influenced by market signals, potentially making them more inclined to follow market trends and exhibit stronger herding behavior in uncertain environments.

6.4. Early stages of startups

Column (4) of Table 7 reports the heterogeneous effect related to the development stage of startups. The results indicate that the coefficient of the interaction term between *lag_EPU* and *stagesetup* is significantly negative, suggesting that rising economic policy uncertainty is significantly associated with weaker herding behavior among early-stage startups. This finding aligns with the argument by Gompers (1995), who noted that early-stage startups typically face greater information asymmetry and higher policy uncertainty. Consequently, venture capitalists tend to adopt cautious, staged investment strategies when investing in such companies, in order to manage potential risks and avoid resource misallocation. Thus, under high economic policy uncertainty, investors may prefer to "wait for updated information" rather than rapidly following others in making concentrated investment decisions. In this scenario, economic policy uncertainty may show a stronger association with reduced herding behavior by reinforcing investors' motivation for independent judgment and risk management.

7. Conclusion

This paper examines the impact of economic policy uncertainty (EPU) on herding behavior in China's venture capital market over the period from 2002 to 2021, providing new evidence on macro-level uncertainty's role in investment strategies. The findings reveal a significant negative association between EPU and herding behavior, suggesting that venture capitalists tend to make more independent investment decisions when faced with rising EPU, rather than blindly following market trends. Further mechanism analysis shows that under high EPU conditions, investors exhibit a higher degree of investment specialization and are more inclined to invest in relatively stable mid-to-late stage enterprises. These behavioral shifts reflect a deliberate reduction in reliance on others' decisions, driven by motivations such as risk management and strategic prudence, thereby contributing to the suppression of herding behavior at the market level.

Heterogeneity analysis further highlights that different types of venture capital institutions respond differently to EPU shocks. Foreign-backed VC firms reduce their herding behavior more markedly under high EPU, whereas government-backed VC firms exhibit a smaller decrease. Moreover, experienced investors and early-stage investors exhibit the stronger reductions in herding when EPU rises.

In summary, this research documents a significant negative association between EPU and herding behavior in venture capital markets—a pattern contrasting with the positive relationship typically found in other financial markets. The observed divergence suggests greater strategic diversity and decision-making independence in venture capital under uncertain conditions, providing new insights into cross-market variations in investor behavior.

This research holds important implications in three dimensions. First, from a theoretical perspective, it extends the EPU framework to private markets, enriching the intersection between behavioral finance and entrepreneurial finance. Second, from an empirical standpoint, by focusing on China—an emerging market characterized by significant institutional involvement and policy orientation—it provides evidence on investor behavior under institutional heterogeneity. Third, from a policy perspective, the findings suggest that policy uncertainty not only contributes to market volatility but may also subtly reshape capital allocation structures. Policymakers are thus advised to pay close attention to the indirect and long-term effects of policy changes on private financial markets when formulating and communicating economic policies.

Although our analysis sheds new light on the link between policy uncertainty and venture capital behavior, several limitations suggest directions for future work. First, our industry-level herding indicator may miss firm-level imitation, so integrating co-investment networks or transaction-level data could yield more precise measures. Second, despite using lagged U.S. EPU as an instrument, residual endogeneity—due to omitted factors or imperfect exclusion restrictions—remains a concern; future studies might exploit quasi-natural experiments or exogenous policy shocks to strengthen causal identification. Finally, because China's institutional and policy environment is unique, extending this research to other countries or regions will be crucial for assessing the generalizability of our findings.

CRediT authorship contribution statement

Yicong Sun: Writing – review & editing, Writing – original draft, Software, Investigation, Formal analysis, Data curation, Conceptualization. **Hui Fu:** Writing – review & editing, Supervision, Project administration, Methodology, Funding acquisition, Formal analysis, Conceptualization.

Appendix A. Appendix

Table A1. Lagged explanatory variables.

	Herd_dummy *Probit*		Herd *OLS*	
	(1)	(2)	(3)	(4)
lag2_EPU	−1.106**	−1.004**	−0.047***	−0.043***
	(0.446)	(0.467)	(0.011)	(0.010)
ln(exp)		−0.011		−0.001**
		(0.012)		(0.001)
statedum		0.084		0.012**
		(0.067)		(0.004)
gov		0.027		0.003*
		(0.025)		(0.001)
distance		0.014		−0.000
		(0.020)		(0.001)
ln(turnnums)		0.012		0.000
		(0.020)		(0.001)
stagesetup		0.002		0.001
		(0.049)		(0.003)
stageexpand		−0.018		−0.000
		(0.051)		(0.002)
turnA		0.049		0.002
		(0.045)		(0.002)
GDPrate		0.037		−0.002
		(0.159)		(0.006)
M2growth		3.862		0.002
		(6.187)		(0.205)
stock_rate		−0.012		−0.001
		(0.011)		(0.000)
MarketVolatility		0.000		0.000
		(0.000)		(0.000)
IPOstopdate		−0.079		−0.000
		(0.226)		(0.010)
Constant	0.470*	0.300	0.022***	0.013
	(0.257)	(0.394)	(0.006)	(0.012)
Observations	62,327	62,327	62,327	62,327
R^2	0.056	0.069	0.073	0.097
R^2-Adj.	0.055	0.068	0.073	0.096
Industry	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
Clustered by quarter and industry	Yes	Yes	Yes	Yes

This table reports the Probit and OLS regression results using the two-quarter lag of China's EPU (*lag2_EPU*). All control variables and clustering specifications remain the same as in the original baseline regressions. Standard errors are reported in parentheses underneath estimated coefficients. *, **, and *** indicate significance at the 10 %, 5 %, and 1 % levels, respectively. In the models from columns (1) to (4), the coefficient of *lag2_EPU* remains significantly negative, and the conclusion remains unchanged.

Table A2. Explanatory variable replaced with DVEPU.

	Herd_dummy *Probit*		Herd *OLS*	
	(1)	(2)	(3)	(4)
lag_DVEPU	−2.875**	−2.791**	−0.121***	−0.115***
	(1.221)	(1.295)	(0.031)	(0.029)
ln(exp)		−0.009		−0.001**
		(0.011)		(0.001)
statedum		0.078		0.011**
		(0.064)		(0.004)
gov		0.027		0.003**
		(0.026)		(0.001)
distance		0.011		−0.000
		(0.020)		(0.001)
ln(turnnums)		0.013		0.000
		(0.019)		(0.001)
stagesetup		0.006		0.001
		(0.048)		(0.003)
stageexpand		−0.008		0.000
		(0.054)		(0.002)

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(*continued*)

	Herd_dummy *Probit*		Herd *OLS*	
	(1)	(2)	(3)	(4)
turnA		0.032		0.002
		(0.041)		(0.002)
GDPrate		0.031		−0.002
		(0.152)		(0.006)
M2growth		3.012		−0.036
		(5.643)		(0.201)
stock_rate		−0.012		−0.001
		(0.010)		(0.000)
MarketVolatility		0.000		0.000
		(0.000)		(0.000)
IPOstopdate		−0.114		−0.002
		(0.223)		(0.010)
Constant	0.657**	0.574	0.029***	0.024
	(0.328)	(0.471)	(0.007)	(0.014)
Observations	62,327	62,327	62,327	62,327
R^2	0.068	0.081	0.085	0.107
R^2-Adj.	0.067	0.080	0.085	0.106
Industry	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
Clustered by quarter and industry	Yes	Yes	Yes	Yes

This table reports the regression results using the Davis et al. (2019) China EPU index (DVEPU), constructed from *People's Daily* and *Guangming Daily*. We aggregate the monthly series into quarterly values by arithmetic mean, scale by 1/1000, and include the one-quarter lag (*lag_DVEPU*) in our models. All control variables and clustering specifications remain the same as in the original baseline regressions. Standard errors are reported in parentheses underneath estimated coefficients. *, **, and *** indicate significance at the 10 %, 5 %, and 1 % levels, respectively. In the models from columns (1) to (4), the coefficient of *lag_DVEPU* remains significantly negative, which confirms that the negative association between herding behavior and EPU is still statistically significant.

Table A3. Replacement of adjustment term in herding behavior measure.

	Herd1_dummy *Probit*		Herd1 *OLS*	
	(1)	(2)	(3)	(4)
lag_EPU	−2.466***	−2.380***	−0.056***	−0.051***
	(0.724)	(0.709)	(0.013)	(0.010)
ln(exp)		−0.049*		−0.001**
		(0.027)		(0.001)
statedum		0.273*		0.011**
		(0.154)		(0.004)
gov		0.099*		0.003**
		(0.054)		(0.001)
distance		−0.033		−0.000
		(0.028)		(0.001)
ln(turnnums)		0.008		0.000
		(0.025)		(0.001)
stagesetup		0.012		0.001
		(0.080)		(0.003)
stageexpand		−0.031		−0.000
		(0.049)		(0.002)
turnA		−0.016		0.002
		(0.067)		(0.001)
GDPrate		−0.038		−0.002
		(0.251)		(0.007)
M2growth		2.677		−0.019
		(5.910)		(0.196)
stock_rate		−0.001		−0.001
		(0.015)		(0.000)
MarketVolatility		0.000		0.000
		(0.000)		(0.000)
IPOstopdate		−0.220		0.000
		(0.247)		(0.009)
Constant	−1.688***	−1.768***	−0.061***	−0.070***
	(0.142)	(0.429)	(0.006)	(0.012)
Observations	62,327	62,327	62,327	62,327
R^2	0.177	0.185	0.084	0.104

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(*continued*)

	Herd1_dummy *Probit*		Herd1 *OLS*	
	(1)	(2)	(3)	(4)
R^2-Adj.	0.174	0.181	0.083	0.103
Industry	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
Clustered by quarter and industry	Yes	Yes	Yes	Yes

This table reports the regression results after replacing the adjustment term. Specifically, we changed the adjustment term to the mean of $\left|pb_{i,t} - E[pb_t]\right|$, recalculated the herding measures *Herd*1_*dummy* and *Herd*, and reran the regressions. All control variables and clustering specifications remain the same as in the original baseline regressions. Standard errors are reported in parentheses underneath estimated coefficients. *, **, and *** indicate significance at the 10 %, 5 %, and 1 % levels, respectively. In columns (1) to (4), the coefficient of *lag_EPU* remains significantly negative, and the conclusion is consistent with the baseline regression.

Table A4. Market-wide investment concentration as a measure of herding behavior.

	HHI_amount	
	(1)	(2)
lag_EPU	−0.138***	−0.106***
	(0.029)	(0.029)
ln(exp)		−0.001
		(0.001)
statedum		0.018**
		(0.005)
gov		0.006***
		(0.002)
distance		−0.000
		(0.002)
ln(turnnums)		−0.002
		(0.002)
stagesetup		0.000
		(0.003)
stageexpand		0.007
		(0.004)
turnA		0.010**
		(0.004)
GDPrate		−0.005
		(0.013)
M2growth		0.525
		(0.595)
stock_rate		−0.001
		(0.001)
MarketVolatility		−0.000
		(0.000)
IPOstopdate		0.037
		(0.042)
Constant	0.269***	0.265***
	(0.015)	(0.031)
Observations	62,327	62,327
R^2	0.176	0.263
R^2 -Adj.	0.176	0.263
Industry	Yes	Yes
Province	Yes	Yes
Clustered by quarter and industry	Yes	Yes

This table reports the regression results using the concentration of investment amounts in the venture capital market (*HHI_amount*) as an alternative measure of herding behavior in place of the original Herd metric. All control variables and clustering specifications remain the same as in the original baseline regressions. Standard errors are reported in parentheses underneath estimated coefficients. *, **, and *** indicate significance at the 10 %, 5 %, and 1 % levels, respectively. As seen, the coefficient of *lag_EPU* is significantly negative, indicating that EPU significantly reduces the overall investment concentration in the venture capital market. As economic policy uncertainty increases, the concentration of overall venture capital investment decreases significantly. In other words, when facing higher levels of policy uncertainty, venture capital institutions' investment behavior becomes more dispersed, with funds no longer concentrated in a few specific industries but instead showing more diversified allocation characteristics.

Table A5. Further addressing endogeneity using USEPU.

	Herd_dummy *Probit*		Herd *OLS*	
	(1)	(2)	(3)	(4)
lag_EPU_R	−2.189***	−1.820***	−0.059*	−0.041*
	(0.551)	(0.477)	(0.026)	(0.022)
ln(exp)		−0.019		−0.002**
		(0.012)		(0.001)
statedum		0.131*		0.014**
		(0.072)		(0.005)
gov		0.022		0.002*
		(0.026)		(0.001)
distance		0.028		0.000
		(0.021)		(0.001)
ln(turnnums)		0.010		0.000
		(0.022)		(0.001)
stagesetup		0.003		0.001
		(0.051)		(0.003)
stageexpand		−0.028		−0.001
		(0.055)		(0.002)
turnA		0.125**		0.006**
		(0.053)		(0.002)
GDPrate		0.022		−0.001
		(0.182)		(0.007)
M2growth		8.177		0.203
		(5.776)		(0.185)
stock_rate		−0.011		−0.001
		(0.014)		(0.000)
MarketVolatility		0.000		0.000
		(0.000)		(0.000)
IPOstopdate		0.140		0.009
		(0.241)		(0.009)
Constant	−0.027	−0.307	0.001	−0.013
	(0.150)	(0.272)	(0.003)	(0.012)
Observations	62,327	62,327	62,327	62,327
R^2	0.042	0.059	0.052	0.081
R^2 -Adj.	0.041	0.057	0.051	0.080
Industry	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
Clustered by quarter and industry	Yes	Yes	Yes	Yes

This table presents regression results addressing endogeneity using U.S. economic policy uncertainty. The variable *lag_EPU_R* is derived via eq. (5) and subsequent adjustments, isolating a purer measure that filters out U.S. policy uncertainty's overlap with domestic economic factors. All control variables and clustering specifications remain the same as in the original baseline regressions. Standard errors are reported in parentheses underneath estimated coefficients. *, **, and *** indicate significance at the 10 %, 5 %, and 1 % levels, respectively. In columns (1) to (4), the coefficient on *lag_EPU_R* remains significantly negative, leaving our conclusions unchanged.

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