Economic Analysis and Policy 85 (2025) 1428–1441

Contents lists available at ScienceDirect

Economic Analysis and Policy

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

Firm-level perception of uncertainty, risk aversion, and corporate real estate investment: Evidence from China's listed firms

Fengfu Mao [a,b], Yue Yuan [c], Fan Zhang [d,*]

[a] Economic Forecasting and Policy Simulation Laboratory, Zhejiang Gongshang University, Hangzhou, 310018, China
[b] School of Economics, Zhejiang Gongshang University, Hangzhou, 310018, China
[c] Graduate Institute for Taiwan Studies, Xiamen University, Xiamen, 361005, China
[d] Intellectual Property Research Institute, Xiamen University, Xiamen, 361005, China

ARTICLE INFO

JEL classification:
E22
E61
G38

Keywords:
Perception of uncertainty
Corporate real estate investment
Risk aversion

ABSTRACT

Real estate, characterized as a safe asset, is a distinct component of corporate financialization. Based on the management discussion and analysis texts of Chinese listed manufacturing companies from 2007 to 2019, our study utilizes textual analysis methods to quantify firm-level perception of economic policy uncertainty and explores the impact and mechanisms of firm-level perception of uncertainty on corporate real estate investment. The findings indicate that an increase in perceived uncertainty significantly enhances corporate real estate investment. These results are robust to a series of tests, including the application of instrumental variables and alternative variable specifications. Heterogeneity analysis reveals that nonstate-owned enterprises and firms in highly marketized regions are more likely to increase their real estate investment in response to economic uncertainty. Additionally, the mechanism analysis identifies risk aversion as the channel through which firm-level perception of uncertainty influences corporate real estate investment. This research not only quantifies firm-level perception of uncertainty but also provides empirical evidence of the link between uncertainty and corporate real estate investment behaviors.

1. Introduction

Mitigating excessive corporate financialization is a key measure for economic growth and stability (Demir, 2009a). Previous studies have explored the influencing factors behind corporate financialization from perspectives such as credit constraints (Launius and Kear, 2019), interest rates (Gong et al., 2023), and financial regulation (Wang and Hu, 2023). However, few studies have focused on the specific behavior of corporate real estate investments as part of their financialization activities (Aalbers and Haila, 2018). Since the volatility of the return on real estate capital is usually less than that of nonreal estate capital, real estate is often regarded as a safe asset that can preserve value in adverse systemic events (Caballero et al., 2017). This special characteristic may drive enterprises to invest in

* Corresponding author at: Xiamen University, 422 Siming South Road, Siming District, Xiamen 361005, Fujian Province, China.
E-mail addresses: ff-mao@163.com (F. Mao), yyuan@stu.xmu.edu.cn (Y. Yuan), zhangfan94@stu.xmu.edu.cn (F. Zhang).

https://doi.org/10.1016/j.eap.2025.02.002
Received 25 December 2023; Received in revised form 12 July 2024; Accepted 3 February 2025
Available online 4 February 2025
0313-5926/© 2025 The Economic Society of Australia (Queensland) Inc. Published by Elsevier B.V. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

real estate as a hedge, distinguishing it from other financialization behaviors. In China, a primary manifestation of enterprise financialization is the substantial investment in real estate by nonreal estate enterprises [1]. This trend may reduce corporate fixed asset investment (Shu et al., 2020), inhibit technological innovation capabilities (Zhou and Chen, 2024), and weaken the effectiveness of monetary policy in stimulating the real economy (Li et al., 2023). These effects are particularly detrimental to China, which has suffered economic shocks in recent years. Therefore, policymakers are in dire need of comprehending the motivations and characteristics of enterprises holding real estate to ensure the stable operation of businesses, resolve real estate-related financial risks, and prevent systemic financial risks.

Moreover, since the financial crisis, governments around the world have increased the frequency and scope of economic interventions, leading to a significant rise in economic policy uncertainty (Baker et al., 2016). This is particularly true in China, where as a transitional economy, economic growth heavily relies on various government policies (Wang and Yang, 2021), resulting in especially high policy uncertainty. This heightened uncertainty makes it difficult for enterprises to predict whether, when, and how the government will change existing economic policies, thereby altering corporate production and operational behavior (Le and Zak, 2006; Gulen and Ion, 2016). Studies have found that economic policy uncertainty significantly impacts corporate investment (Julio and Yook, 2012; Wang et al., 2014; Gulen and Ion, 2016), financing costs (Kelly et al., 2016; Çolak et al., 2017), default risks (Lu et al., 2023), and innovation (Geng et al., 2023; Liu and Gao, 2024). Additionally, the literature indicates that economic policy uncertainty affects the allocation of corporate financial assets. Given that China has consistently lacked safe assets (Dong et al., 2021), enterprises might be motivated to purchase real estate as a safe asset during periods of economic uncertainty. Guided by this perspective, our research aims to address two core questions. First, does economic policy uncertainty affect corporate real estate purchasing behavior? Second, what is the mechanism through which economic policy uncertainty influences corporate real estate purchasing behaviour?

In this paper, we examine the impact of corporate perceptions of economic uncertainty on their investments in real estate. By applying textual analysis methods to the management discussion and analysis texts from Chinese listed manufacturing companies over the period from 2007 to 2019, this research quantifies firm-level perception of uncertainty and evaluates its impact on real estate investment decisions. The results indicate that an increase in perceived uncertainty significantly enhances corporate investment in real estate. Heterogeneity analysis shows that nonstate-owned enterprises and firms in highly marketized regions are particularly inclined to increase their real estate investments in response to economic uncertainty. Additionally, the mechanism analysis identifies risk aversion as the channel through which a firm's perception of uncertainty influences corporate real estate investment.

Our study contributes to the literature in three ways. First, by focusing on the behavior of corporate real estate investment, our research enriches the study of corporate financialization. Real estate, as a significant capital expenditure for corporations, plays a critical role in production, operation, and investment financing activities. However, previous research has primarily focused on corporate financialization from the perspective of financial asset portfolios (Demir, 2009b), with real estate not receiving sufficient attention (Aalbers and Haila, 2018). By isolating real estate from other financial behaviors, we utilized data from Chinese listed companies to discover that economic uncertainty drives companies to purchase more real estate as a safe asset through risk-averse behavior, thereby reinforcing corporate financialization. This also provides new perspectives and evidence for current research on how uncertainty affects corporate financialization.

Second, our study contributes to the literature by enriching the discussion on corporate real estate investments. Previous research has focused primarily on the impact of corporate real estate investment. First, the collateral effect, as evidenced by Ambrose et al. (2017), Sun and Gunia (2018) and Bahaj et al. (2020), suggests that companies hold real estate as a collateral to manage liquidity and risk. Additionally, some studies have discussed the crowding-out effect of corporate real estate investment. They argue that when the expected returns on capital investments are low or when financial markets offer more attractive returns, companies might substitute traditional capital investments with financial investments (Lu et al., 2019; Liang et al., 2024). However, there has been less discussion on the factors influencing corporate real estate holdings.

Finally, our study is related to the literature on the economic consequences of uncertainty. Studies indicate that economic policy uncertainty has significant impacts on corporate investment (Julio and Yook, 2012; Wang et al., 2014; Gulen and Ion, 2016), increases financing costs (Kelly et al., 2016; Çolak et al., 2017), raise default risks (Lu et al., 2023), and hinders innovation (Geng et al., 2023; Liu and Gao, 2024). This paper discusses the impact of economic policy uncertainty on corporate real estate investment activities, enriching the discussion on the effects of uncertainty. Additionally, our study contributes to the literature on quantifying risk and uncertainty through text analysis. Existing research often employs the economic policy uncertainty index based on news reports (Baker et al., 2016), which, while providing a national-level measure, fails to reflect the economic policy uncertainty perceived by individual companies and is limited by its time-series nature, potentially leading to estimation biases. Our study utilizes natural language processing technology to quantify corporate perceptions of economic policy uncertainty based on discussion and analysis texts from the management of listed companies.

The subsequent sections of the paper are organized as follows: the second section provides the theoretical analysis and research hypotheses; the third section clarifies the research design and methodology; the fourth section describes the empirical findings; and the fifth section concludes the study.

[1] Data from Wind Economic Database shows that in 2019, approximately 49% of the 3,743 A-share listed firms in China held real estate to earn rental income and capital appreciation, with the total market value of their real estate holdings reaching 1.33 trillion yuan. In contrast, only 29% of companies participated in other financial investments such as bank wealth management products and trust products, with their holdings being much smaller than real estate holdings.

2. Theoretical analysis and research hypotheses

2.1. Economic policy uncertainty and corporate real estate investment

The literature presents conflicting views on the relationship between uncertainty and corporate investment decisions. Theories such as the real options effect, precautionary savings effect, and financial friction effect suggest that uncertainty suppresses corporate investment (McDonald and Siegel, 1986; Bansal and Yaron, 2004; Christiano et al., 2010). In contrast, theories such as the Oi-Hartman-Abel effect argue that uncertainty may encourage corporate investment (Oi, 1961; Hartman, 1972; Abel, 1983). The specific implications of economic policy uncertainty for corporate financialization in China remain contentious. For instance, Peng et al. (2018) and Huang et al. (2021) found a negative association between economic policy uncertainty (EPU) and corporate financialization. Conversely, Cheng and Masron (2024) and Nie et al. (2020) reported a positive relationship. However, real estate in China is distinct from other financial assets. With rising real economic uncertainty, investors view real estate as a safe haven during turbulent times (Eraslan, 2016).

A safe asset is one that is expected to preserve its value during adverse systemic events (Caballero et al., 2017). In China, since the beginning of its economic reform and opening-up, the Chinese government has been actively formulating various policies to stimulate economic development, which is considered a crucial mechanism for China's economic growth (Wang and Yang, 2021). However, the rapid and frequent changes in these policies have introduced a high level of perceived uncertainty in corporate decision-making processes. Despite these challenges, the real estate market in China has thrived during periods of increasing uncertainty. This resilience has led observers to characterize real estate as a safe asset, noted for its low volatility and high liquidity (Guo et al., 2020). Furthermore, using data from Chinese household surveys, Dong et al. (2021) observed that greater economic uncertainty tends to encourage increased investments in housing by households.

Additionally, unlike many Western countries with well-developed capital markets, China's capital market is still evolving and is characterized by notable supply shortages (Jiang et al., 2020). Furthermore, the underdeveloped financial system constrains the capacity of the country to produce safe assets. Furthermore, tight regulation of financial accounts intensifies the scarcity of safe assets in the domestic market (Dong et al., 2021). As uncertainty rises, firms may pursue diversified investments to mitigate risks, including financial management services, and the purchase of options, futures, and other financial derivatives (Yang et al., 2023). However, in China, the underdeveloped derivatives market fails to meet the needs for effective hedging and risk management (Fan and Liu, 2022). Consequently, in times of rising policy uncertainty, the demand for real estate—commonly regarded as a "safe asset"—may increase among domestic enterprises. Based on the above analysis, this paper proposes the following:

Hypothesis 1. An increase in firm-level perception of uncertainty will enhance its investment in real estate.

2.2. Risk aversion and corporate real estate investment

In the preceding analysis, within the context of China's economic development, real estate is widely regarded as a safe asset, substantiated by the characteristics of rising economic policy uncertainty in China (Guo et al., 2020; Dong et al., 2021). To delve deeper, this paper analyses the impact of uncertainty on corporate real estate investments from three perspectives: the enterprises themselves, their management, and investors (Nie et al., 2020). In doing so, we incorporate three existing theoretical frameworks: real options theory, management risk aversion theory, and risk compensation theory (Jensen and Meckling, 1976; Bernanke, 1983; Arellano et al., 2019). Each theory underscores the preference for risk aversion among entities amid heightened uncertainty.

Real options theory views uncertainty through a corporate-centric lens. It posits that corporate investments are often high-cost and low-reversible. As uncertainty escalates, the prospects of investment projects become more ambiguous, significantly enhancing the option value of delaying investments (Bernanke, 1983; Brennan and Schwartz, 1985; McDonald and Siegel, 1986). A key assumption of this theory is that investments are at least partially irreversible, manifested in the sunk and transaction costs incurred when disposing of investment assets. Thus, the degree of investment reversibility measures a company's adaptability during turbulent times, reflecting its risk management capabilities (Liu and Zhang, 2020). In the context of China's continuously resilient real estate market, properties have demonstrated liquidity and reversibility. With increasing uncertainty, real estate assets not only possess risk-averting characteristics but also enhance a firm's ability to withstand risks to some extent. Management's risk aversion theory approaches uncertainty from the management's perspective. This theory suggests that due to substantial company stock holdings, managers often exhibit risk-averse behavior, preferring to avoid risks (Jensen and Meckling, 1976; Smith and Stulz, 1985). As external economic uncertainty increases, their aversion to risk intensifies when making investment decisions. The relative certainty of real estate values also leads managers to consider them "safe assets" (Bahaj et al., 2020). As uncertainty rises, management's willingness to avoid risks increases, placing a greater premium on the safety of assets. Risk compensation theory views uncertainty from the perspective of investors. This theory argues that as uncertainty rises, investors demand higher risk premiums, leading to increased financing costs for firms (Christiano et al., 2014; Gilchrist et al., 2014; Arellano et al., 2019). Real estate is often regarded as high-quality collateral by banks, and in times of heightened uncertainty, firms may be motivated to reserve real estate in advance to avert cash flow risks that may arise from financing constraints.

The safety of an asset requires it to maintain a stable value with assured returns in the future. National currencies and government bonds are often considered safe assets due to the backing of national credit. For instance, in global financial markets, US dollars and Treasury bonds are frequently viewed as safe assets. However, when considering inflation, even the safety of cash and government bonds is discounted. Jordà et al. (2019) analysed asset return rates in several developed countries since 1870 and found that housing

prices have consistently outpaced inflation over the long term. With rising real economic uncertainty, investors view real estate as a safe haven during turbulent times (Eraslan, 2016). From the perspective of safe assets, in China's urbanization context, real estate demonstrates strong liquidity and monetization capabilities. Particularly during China's rapid urbanization phase, the real estate market has emerged as a market with a bright future and substantial scale. Faced with China's rapid urbanization and active integration into globalization, investors have consistent expectations for the development of the real estate market, accepting housing assets as creditworthy. Dong et al. (2021) argued from the perspective of households that real estate serves as a safe asset.

In summary, as firms increasingly perceive uncertainty, their tolerance for risk diminishes, and their demand for risk aversion intensifies. Concurrently, with the continuous boom in the real estate market and rising housing prices, real estate is widely perceived as a "safe asset," with the hope of mitigating risks through investment and ownership. Consequently, economic policy uncertainty influences corporate real estate investment activities through risk aversion. Based on the above analysis, as an inference of the internal mechanism of Hypothesis 1, this paper proposes the following:

Hypothesis 2. In an environment of uncertainty, risk aversion is the operative mechanism for corporate real estate investment.

3. Research design

3.1. Sample selection and data sources

Referring to the studies by Qi et al. (2021) and Shen et al. (2024), our study selected listed manufacturing companies from the A-share markets of Shanghai and Shenzhen from the first quarter of 2007 to the fourth quarter of 2019 as research subjects. The management analysis and discussion texts were sourced from the China Research Data Services Platform (CNRDS), and financial data were derived from the CSMAR database of listed companies. The samples were filtered according to the following criteria: (1) retained samples from the manufacturing sector according to the industry classification standards of the 2012 edition by the China Securities Regulatory Commission, excluding those that had undergone industry changes; (2) excluded companies labelled ST, ST*, or PT; (3) omitted samples with missing data; and (4) eliminated observations with evidently abnormal financial indicators, such as net profit margins greater than 1 and debt-to-asset ratios outside the 0-1 range. To mitigate the influence of outliers on the empirical analysis, a 1% two-sided trimming was applied to the continuous variables at the corporate level. Consequently, the final sample comprised 1781 manufacturing companies with a total of 47,537 observations.

3.2. Definition of key variables

3.2.1. Firm-level perception of uncertainty

Existing studies commonly utilize the economic policy uncertainty index constructed by Baker et al.(2016) based on news reports to measure uncertainty. However, this widely used indicator fails to capture the unique perceptions of corporate entities regarding economic policy uncertainty. To address this gap, this article employs discussion and analysis texts from listed company management, applying text analysis techniques to construct an index of uncertainty perception at the corporate level and quantifying each company's viewpoint on economic policy uncertainty. With the advancement and widespread adoption of computer technology, unstructured data such as text are being increasingly applied in the fields of economics and finance (Loughran and Mcdonald, 2011, 2014; Baker et al., 2016; Hoberg and Phillips, 2018; Liu et al., 2024; Wang et al., 2024). Building on the research by Nie et al. (2020) and Yu et al. (2021), our study develops a dictionary containing words with specific meanings to filter and identify texts of particular content. Specifically, if a text segment contains certain words, it is deemed to express the corresponding specific meaning. In the context of this research, if a sentence simultaneously includes "policy words" and "uncertainty words,"[2] it is considered to convey the firm-level perception of economic policy uncertainty. The specific calculation process for economic policy uncertainty is as follows:

(1) Our study utilizes data from the China Research Data Services Platform (CNRDS), employing the text from management discussions and analyses as the primary corpus for measuring firm-level perception of uncertainty. (2) In preprocessing the corpus, all numbers, English characters, and punctuation marks except for periods, as well as special symbols, were removed. (3) Considering Chinese linguistic habits, the text was segmented into sentences using periods, with each sentence serving as the basic unit for subsequent analysis. (4) Assuming that the number of sentences in the management discussion and analysis text of company i in year t is S_{it}, we employed Python's Jieba word segmentation module for each sentence, removing stopwords concurrently. To reduce the ambiguities inherent in segmentation, we customized a lexicon that includes the full and abbreviated names of all A-share listed companies, accounting terms, phrases indicative of economic policies, and words related to uncertainty. After segmentation, each sentence became a combination of words. Then, for each sentence (s), we examined the words it contained; if a sentence simultaneously included words from both the economic policy lexicon and the uncertainty lexicon, it was identified as expressing economic policy uncertainty (P). The firm's economic policy uncertainty ($FEPU$) is measured by the ratio of the number of uncertainty words in the sentences expressing economic policy uncertainty (n_s) to the total number of words in the management discussion and analysis text (N). This calculation includes an indicator function $I_P(s)$, where $I = 1$ when s is in P, and $I = 0$ otherwise.

[2] The lists of "policy words" and "uncertainty words" are sourced from the study by Nie et al. (2020). The Chinese list can be downloaded from "http://www.niehuihua.com/uploads/soft/200703/1-200F3131354.pdf". The English translations of the two lists, "policy words" and "uncertainty words," can be found in the appendix.

$$FEPU_{it} = \frac{\sum_{s=1}^{S_{it}} n_s I_P(s)}{N} \quad (1)$$

To mitigate the estimation bias from potential reverse causality, our study, based on firm-level economic policy uncertainty, categorized listed companies into corresponding industries according to the "Classification Guidelines for Listed Companies (Revised in 2012)" by the Securities Regulatory Commission. We then calculated the average economic policy uncertainty at the industry level (*IEPU*) to serve as the core explanatory variable of our study. As the core independent variable and the dependent variable are situated at the industry and firm levels, respectively, this effectively avoids significant issues of reverse causality.

3.2.2. Corporate real estate investment

Due to limitations in research data, most literature focuses on analysing the entirety of a corporation's real estate assets, making it difficult to clearly examine investment behaviors and their impacts. Taking the United States as an example, the Generally, Accepted Accounting Principles (GAAP) do not mandate a detailed classification disclosure for real estate assets; instead, they only stipulate measurements based on historical costs (Schuur, 2016). Consequently, U.S. corporations only disclose the historical cost and depreciation of land and buildings without separately listing investment properties. In contrast, China's "Enterprise Accounting Standards No. 3—Investment Real Estate" specifies that investment real estate includes properties held to earn rentals or for capital appreciation, or both, primarily including leased land use rights, land use rights held for appreciation and subsequent transfer, and leased buildings. The information disclosed by Chinese listed companies in accordance with CAS3 provides an excellent research opportunity for an in-depth understanding of corporate real estate investments. Drawing on the research of Chen et al. (2019) and Kuang et al. (2020), this paper uses the proportion of investment in real estate to total assets as a metric to measure the scale of corporate investment in real estate.

3.2.3. Control variables

To mitigate endogeneity issues arising from omitted variables, our study carefully selects control variables based on a thorough review of the literature concerning the factors that influence corporate investment decisions, with a particular focus on the impacts of economic uncertainty. Specifically, our study incorporates three key factors in the regression analysis: corporate finance, corporate governance, and the external environment.

In the realm of corporate finance, we include controls for firm size, age, leverage ratio, cash flow, Tobin's Q, and profitability. All of these factors are directly impacted by economic conditions and significantly affect investment decisions, according to Wang et al. (2014), Gulen and Ion (2016), Liu and Lv (2023), and Jiang et al. (2024). With respect to corporate governance, our study, referring to Luo and Wu (2023), Wang et al. (2024), incorporates ownership, board size, shareholding concentration, and the duality of chairperson and CEO roles. The external environment involves, on the one hand, the economic environment of the industry in which the enterprises operate and, on the other hand, the economic environment of the location where the enterprises are situated. For the industry environment, this paper controls for industry competition intensity, referring to Alam et al. (2023) and Si et al. (2024). For the regional economic environment, the paper controls for the local housing price growth rate, deposit balances, and GDP per capita of the city where the company is located, referring to Vo et al. (2023) and Lu et al. (2024), which reflect broader market and economic conditions that can affect corporate investment behavior.

To further account for nonobservable heterogeneity, the paper controls for firm fixed effects and quarterly fixed effects, offering a robust framework for analysing the impacts of perceived economic uncertainty on corporate investment behaviours. The data for this analysis were primarily obtained from the CSMAR database and the National Bureau of Statistics. The definitions and basic meanings of each variable are systematically detailed in Table 1.

Table 1
Definition of main variables.

Variable	Definition	Source
R_Invest	real estate Investment/Total assets	CSMAR
Industry-level perception of uncertainty (*IEPU*)	The mean of firm-level perception of uncertainty at the industry level	CNRDS
Firm size (*Size*)	The natural log of total assets	CSMAR
Firm age (*Age*)	The difference between the current period and the time of establishment of the enterprise	CSMAR
Leverage ratio (*Lev*)	Total liabilities/Total assets	CSMAR
Cash flow (*CFO*)	Net cash flow/total assets	CSMAR
Tobin's q (*TobinQ*)	an assessment of investment opportunity, proxied by the ratio of the market value of equity to the book value	CSMAR
Profitability (*ROA*)	Net profits/total assets	CSMAR
Ownership (*SOE*)	Equals 1 if actual controller is the government, equals 0 otherwise.	CSMAR
Board size (*Drc*)	The natural log of the number of directors	CSMAR
Shareholding concentration (*ShrHolder*)	Shareholding of the largest shareholder	CSMAR
CEO duality (*Partime*)	Equals 1 if one person serves both as a firm's CEO and board chair, equals 0 otherwise.	CSMAR
Degree of industry competition (*HHI*)	Herfindahl–Hirschman Index	CSMAR
House price growth (*Hprice*)	House price growth rate in the city where the firm is located	NBS
Deposit balances (*Deposit*)	Balance of deposits in the city where the firm is located/GDP	NBS
GDP per capita (*PGDP*)	GDP in the city where the firm is located/population	NBS

3.3. Model construction

To examine the impact of perceived uncertainty on corporate real estate investment, our study constructs an econometric model referencing the methodologies of Julio and Yook (2012) and Gulen and Ion (2016):

$$R_Invest_{it} = \beta_0 + \beta_1 IEPU_{jt} + X'_{it}\gamma + Z'_{jt}\theta + W'_{ct}\mu + \lambda_i + \sigma_t + \epsilon_{it} \quad (2)$$

Here, the subscript i denotes the company, t represents the quarter, j indicates the industry of company i, and c represents the city where the firm headquarters is located. The dependent variable R_invest_{it} signifies the scale of corporate real estate investment. The primary explanatory variable, $IEPU_{jt}$, represents the industry-level average of perceived business uncertainty. The term X'_{it} is a vector consisting of control variables for firm i in quarter t. The term Z'_{jt} is a vector consisting of the control variable of industry j in quarter t. The term W'_{ct} represents a group of control variables for city c, where the firm headquarters is located in quarter t. The definitions of these control variables are provided in Table 1. The term λ_i is the firm fixed effect, controlling for company characteristics that do not change over time. σ_t is the time (quarterly) fixed effect, which is used to control for changes in the macroeconomic environment. The error term, ϵ_{it}, accounts for potential serial correlation and heteroskedasticity effects on the standard error estimates of the parameters. To mitigate these effects, the study employs robust standard errors clustered at the industry level.

4. Empirical results

4.1. Descriptive statistics

Table 2 presents the descriptive statistical results of our study. IEPU represents the mean of firm-level perception of uncertainty at the industry level, with an average value of approximately 0.001. This suggests that, on average, approximately 0.1% of the text in management analysis and discussion reports addresses economic policy uncertainty perceived within the firm. For the other control variables, the average cash flow and Tobin's q are 0.012 and 2.715, respectively, consistent with the findings reported by Wang et al. (2014) and Lin and Fu (2017). The average logarithm of total assets is 21.804, aligning with the research of Yang et al. (2019). Furthermore, the average ROA is 0.013, which is in line with observations from other studies concerning China (Firth et al., 2016; Liu and Zhang, 2020).

4.2. Baseline regression

To explore the impact of perceived uncertainty on corporate real estate investment, our study employed Model (2) to conduct regression analysis. Table 3 presents the results of the panel fixed effects model, with corporate real estate investment as the dependent variable. The regression outcomes indicate that the coefficient for perceived uncertainty is positive and statistically significant at the 5% level. This suggests that an increase in perceived uncertainty heightens the degree of real estate corporatization. In terms of economic significance, for a one standard deviation increase in perceived uncertainty (0.0004), the scale of corporate real estate investment increases by 0.0655 percentage points ($0.0004 \times 1.6366 \times 100$), equivalent to 8.62% (0.0076) of the average proportion of real estate investment in the sample. This result is consistent with the opinion that economic policy uncertainty promotes corporate financialization (Nie et al., 2020; Cheng and Masron, 2024).

4.3. Endogenous testing

Potential endogeneity issues could challenge the validity of the results. Although our baseline regression's primary independent

Table 2
Descriptive statistics.

Variable	Mean	Std. Dev	Minimum	Maximum	Observation
R_Invest	0.0076	0.0210	0.0000	0.1374	47,537
IEPU	0.0012	0.0004	0.0004	0.0020	47,537
Size	21.8043	1.1551	19.6577	25.2425	47,537
Age	15.1051	5.5953	3.0000	29.0000	47,537
Lev	0.3990	0.2040	0.0452	0.8808	47,537
CFO	0.0129	0.0399	-0.1016	0.1327	47,537
ROA	0.0131	0.0199	-0.0580	0.0902	47,537
TobinQ	2.7152	1.8075	0.9243	10.8004	47,537
SOE	0.3491	0.4767	0.0000	1.0000	47,537
Drc	2.2055	0.2667	1.3863	2.8332	47,537
ShrHolder	0.3461	0.1426	0.0909	0.7370	47,537
Partime	0.2596	0.4384	0.0000	1.0000	47,537
HHI	0.0885	0.0692	0.0186	0.3502	47,537
Hprice	10.4267	11.8545	-11.1783	53.6890	47,537
Deposit	1.8420	1.0041	0.5240	5.1184	47,537
PGDP	8.0154	3.6877	1.3514	15.5320	47,537

Table 3
Firm-level perception of uncertainty and corporate real estate investment: Baseline regression results.

Variable	(1) *R_Invest*	(2) *R_Invest*	(3) *R_Invest*
IEPU	1.6076*	1.6649*	1.6366**
	(0.862)	(0.825)	(0.789)
Size		-0.0028**	-0.0028**
		(0.001)	(0.001)
Age		0.0002	0.0002
		(0.000)	(0.000)
Lev		0.0042	0.0042*
		(0.002)	(0.002)
CFO		-0.0016	-0.0020
		(0.002)	(0.002)
TobinQ		0.0000	0.0001
		(0.000)	(0.000)
ROA		-0.0145**	-0.0133**
		(0.006)	(0.006)
SOE		-0.0000	-0.0005
		(0.001)	(0.001)
Drc		0.0008	0.0009
		(0.001)	(0.001)
ShrHolder		0.0007	-0.0011
		(0.005)	(0.005)
Partime		0.0004	0.0004
		(0.000)	(0.000)
HHI		-0.0177*	-0.0185
		(0.010)	(0.011)
Hprice			-0.0000*
			(0.000)
PGDP			-0.0009*
			(0.000)
Deposit			-0.0001
			(0.000)
Firm FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
adj. R^2	0.642	0.647	0.651
Observations	49,080	49,038	47,537

Notes: Robust standard errors are clustered at the industry level. *p < 0.10, **p < 0.05, ***p < 0.01.

and dependent variables are based on industry and company levels, respectively, mitigating obvious reverse causality concerns and reducing potential estimation biases from endogeneity issues to some extent, there remains a risk of endogeneity due to omitted variables. To further alleviate this concern, our study employs the average perceived uncertainty level of other industries as an instrumental variable. In an economic system, industries do not exist in isolation but are part of a complex production network, likely affected by similar policy impacts. Therefore, the mean economic policy uncertainty of other industries is correlated with the current industry's uncertainty level, meeting the relevance requirement for an instrumental variable. Moreover, the subject of our study is manufacturing firms. While final products in various industries depend on intermediate goods and changes in the intermediate goods sector directly affect the behavior of the final goods sector, for manufacturing firms, investment properties are not their end product. Hence, the average perceived uncertainty level of other industries has no direct connection with the real estate investment of firms in a specific industry, satisfying the exclusivity requirement for an instrumental variable. The first-stage F value of the instrumental variable method is 39.65, exceeding the critical value of 16.38 at the 10% significance level, indicating that it has passed the weak

Table 4
Endogeneity test: instrumental variable method.

Variable	Stage1 *IEPU*	Stage2 *R_Invest*
IV	11.3901*** (1.809)	
IEPU		2.5217*** (0.927)
Controls	Yes	Yes
Firm FE	Yes	Yes
Time FE	Yes	Yes
Observations	47,537	47,537
Kleibergen–Paap rk Wald F statistic	39.65	\

Notes: Robust standard errors are clustered at the industry level. *p < 0.10, **p < 0.05, ***p < 0.01.

instrumental variable test and is thus valid. This paper re-estimated Model (2) using the two-stage least squares method, and the specific results are shown in Table 4. Consistent with the baseline regression, the findings once again confirm that an increase in perceived uncertainty prompts firms to augment their real estate investment scale.

4.4. Robustness tests

4.4.1. Alternative measures of corporate real estate investment

First, our study adjusts the measurement approach for corporate real estate investment. Investment properties mainly include rented land use rights, land use rights held for appreciation before transfer, and rented buildings. Among these components, buildings are classified as tangible assets, while land use rights are considered intangible assets. Therefore, this paper utilizes the proportion of investment in total tangible and intangible assets to measure the degree of real estate corporatization, denoted as *F_Invest*. The regression results presented in Table 5, column 1, remain significant at the 5% level, indicating that an increase in uncertainty perception enhances corporate real estate investment, supporting the conclusions of the baseline regression.

4.4.2. Alternative measures of the perception of uncertainty

Second, our study employs different economic policy uncertainty indices to test the robustness of our findings. On the one hand, the study reconducted a regression using the China Economic Policy Uncertainty Index measured by Baker et al. (2016). The results in column 2 of Table 5 show a significant positive relationship with the uncertainty index, confirming the robustness of our conclusions. On the other hand, we adopted the approach of Wu et al. (2023) and conducted a robustness test using the local officials' turnover index. Specifically, when a change occurs in the mayor or party secretary of city *c* where the listed company is registered in year *t*, *Change* is set to 1; otherwise, it is 0. The empirical results, as shown in column 3 of Table 5, are consistent with the baseline regression, indicating the robustness of the study's conclusions.

4.5. Heterogeneity Analysis

To provide a comprehensive understanding of how different variables impact investment behavior, we performed detailed heterogeneity analyses at both the firm and regional levels, the results of which are summarized in Table 6 and discussed below.

4.5.1. Heterogeneity analysis of firm ownership

At the firm level, we conducted a heterogeneity analysis based on the nature of enterprise ownership. Specifically, we categorized enterprises based on their ownership structure into state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs), applying methodologies such as those used by Kou et al. (2023) and Jia et al. (2024). Our regression analyses, as shown in columns 1 and 2 of Table 6, reveal significant differences in investment behaviors across these categories. For non-SOEs, there is a significant positive correlation between the perception of economic uncertainty and real estate investment. This finding suggests that non-SOEs may perceive real estate investments as safe havens during times of economic unpredictability, likely because these firms are more susceptible to economic fluctuations and policy changes. Conversely, this correlation is not statistically significant among SOEs, potentially due to their larger size, greater operational stability, and closer alignment with government policies that might shield them from economic shocks.

4.5.2. Heterogeneity analysis of regional marketization

From the standpoint of region, we performed a heterogeneity analysis based on regional marketization levels. Drawing on the research by Chatterjee et al. (2023), Luo and Wu (2023) and utilizing the China Marketization Index database, we divided the samples into those from high- and low-marketization regions based on the marketization levels of Chinese provinces and the locations of the enterprises. The specific results are also shown in columns 3 and 4 of Table 6. In highly marketized regions, perceived economic uncertainty has a significantly positive effect on real estate investment. This indicates that firms in more market-oriented environments

Table 5
Robustness checks: alternative real estate investment and economic policy uncertainty proxies.

Variable	(1) *F_Invest*	(2) *R_Invest*	(3) *R_Invest*
IEPU	5.1972** (2.274)		
EPU		0.0003*** (0.000)	
Change			0.0005*** (0.000)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Time FE	Yes	No	Yes
adj. R^2	0.676	0.649	0.668
Observations	47,537	47,537	41,272

Notes: Robust standard errors are clustered at the industry level. *p < 0.10, **p < 0.05, ***p < 0.01.

Table 6
Heterogeneity analysis: enterprise ownership and regional marketization levels.

Variable	(1) *Non-SOEs*	(2) *SOEs*	(3) *High Marketization*	(4) *Low Marketization*
IEPU	1.1102*	0.0317	1.0789**	0.1658
	(0.588)	(0.487)	(0.521)	(0.556)
Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	No	Yes	Yes
adj. R^2	0.668	0.717	0.685	0.659
Observations	30,940	16,597	39,486	8,043

Notes: Robust standard errors are clustered at the industry level. *p < 0.10, **p < 0.05, ***p < 0.01.

are capable of flexibly adjusting their investment strategies in response to uncertainty, potentially considering real estate investment as a hedge against future economic downturns. In contrast, in regions with lower marketization, this relationship is not evident, suggesting that inefficient market mechanisms may limit firms' ability to adapt rapidly to economic changes.

4.6. Mechanism analysis

Given that economic policy uncertainty may augment corporate activities in real estate investment, what are the specific underlying mechanisms? From the perspective of safe assets, the scarcity of safe assets in China is particularly pronounced due to the underdeveloped financial market and stringent regulation of capital accounts, making real estate an ideal safe asset (Dong et al., 2021). Facing housing, widely regarded as a safe asset, the boom in China's real estate market, coupled with the increased uncertainty brought about by economic slowdown, provides an excellent opportunity to test the risk aversion mechanism. Our study, based on real options theory, managerial risk aversion theory, and risk compensation theory, employs an interaction model to examine the risk aversion mechanism, aiming to clarify how uncertainty impacts the corporate decision-making process in real estate investment.

4.6.1. Real options perspective

From a corporate perspective, according to real options theory, firms tend to view future investment opportunities as call options. An increase in uncertainty increases the value of these call options, causing firms to prefer delaying investments while waiting for more information (Bernanke, 1983). This theory underscores the irreversibility and high sunk costs of investment projects, meaning that if an investment fails, it is difficult for the firm to recoup funds by liquidating project assets. Therefore, in an environment of rising uncertainty, firms make cautious investment decisions. However, real estate, being highly liquid and reversible, is often considered a "safe asset" (Dong et al., 2021), acting as a hedge in uncertain times and enhancing the firm's capacity to withstand risks. Thus, increasing uncertainty deepens the degree of corporatization of real estate. The liquidity of real estate and the development of the real estate market are closely linked; specifically, the ease of real estate liquidation and the risk associated with asset investment are interconnected. Following the approach of Nie et al. (2020) in measuring investment risk, this paper uses the difference in volatility between capital markets and secondary housing markets (*Volatility*) as a proxy for real estate investment risk and thus for reversibility.

Table 7
Mechanisms: real options perspective, management risk aversion perspective and risk compensation perspective.

Variable	(1) *R_Invest*	(2) *R_Invest*	(3) *R_Invest*
*IEPU*Volatility*	0.0011**		
	(0.000)		
*IEPU*Msh*		0.0845***	
		(0.028)	
*IEPU*FC*			-0.8924***
			(0.303)
IEPU	1.6671	1.9539**	0.8775
	(1.684)	(0.810)	(0.714)
Volatility	-0.0000		
	(0.000)		
Msh		-0.0001***	
		(0.000)	
FC			-0.0040***
			(0.001)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
adj. R^2	0.691	0.652	0.652
Observations	19,258	47,537	47,537

Notes: Robust standard errors are clustered at the industry level. *p < 0.10, **p < 0.05, ***p < 0.01.

The analysis suggests that for firms in regions with greater market volatility differences, an increase in uncertainty will lead to an increase in real estate holdings. The regression results presented in column 1 of Table 7 show that the interaction term between perceived uncertainty and the difference in market volatility is significantly positive, indicating that in an environment of rising uncertainty, the greater the reversibility of real estate in a given region is, the greater the degree of real estate cooperation. Therefore, based on real options theory, risk aversion is the primary channel through which rising uncertainty induces firms to increase real estate investment.

4.6.2. *Management risk aversion perspective*

According to the risk aversion theory of corporate management, managers holding substantial company shares typically exhibit risk-averse characteristics, preferring to avoid risk (Jensen and Meckling, 1976; Smith and Stulz, 1985). In an environment of rising uncertainty, management's risk-taking becomes more cautious (Panousi and Papanikolaou, 2012). At equal levels of perceived uncertainty, the greater the incentive intensity for management is, the greater their aversion to risk. Against this backdrop, real estate, with its relative value certainty, is regarded by managers as a "safe asset" (Bahaj et al., 2020), leading to a preference for real estate investment. This paper measures the incentive intensity of agents through the proportion of management shareholding (*Msh*). Based on the above analysis, it can be hypothesized that for companies providing strong incentives to their management, the greater the economic policy uncertainty they face, the stronger the management's aversion to risk, and the greater their tendency to invest in real estate. As demonstrated in column 2 of Table 7, the coefficient of the interaction term between perceived uncertainty and management incentive intensity is significantly positive, indicating that with rising uncertainty, the greater the incentive provided to management is, the greater the degree of corporatization of real estate. Thus, based on the risk aversion theory of management, risk aversion is a significant channel through which increased uncertainty leads to augmented real estate investment by firms.

4.6.3. *Risk compensation perspective*

Uncertainty not only affects the internal decision-making mechanisms of corporations but also influences investors' judgments about the prospects of business development, thereby impacting corporate investment decisions. According to risk compensation theory, as uncertainty rises, investors' expectations for risk premiums strengthen, leading to a demand for higher risk compensation and consequently increasing the cost of corporate financing (Gilchrist et al., 2014; Christiano et al., 2014; Arellano et al., 2019). In China, businesses primarily rely on indirect financing, often securing loans from banks using collateral, with a preference for land or real estate. Therefore, to circumvent potential cash flow risks that may arise from financing constraints, corporations are motivated to reserve real estate in advance. Against this backdrop, real estate favoured by bank credit preferences attracts firms with lower financing constraints. Our study employs the SA index to measure the extent of corporate financing constraints. Based on the aforementioned analysis, it can be hypothesized that as perceived uncertainty intensifies, firms with lower financing constraints (those in a better position) are inclined to increase their real estate investments to mitigate potential operational cash flow risks. The regression results, as shown in column 3 of Table 7, indicate that the coefficient of the interaction term between perceived uncertainty and corporate financing constraints is significantly negative, implying that as uncertainty escalates, firms with lower financing constraints tend to increase their real estate investments. Therefore, based on risk compensation theory, risk aversion serves as a mechanism for corporations to augment real estate investments in response to rising uncertainties.

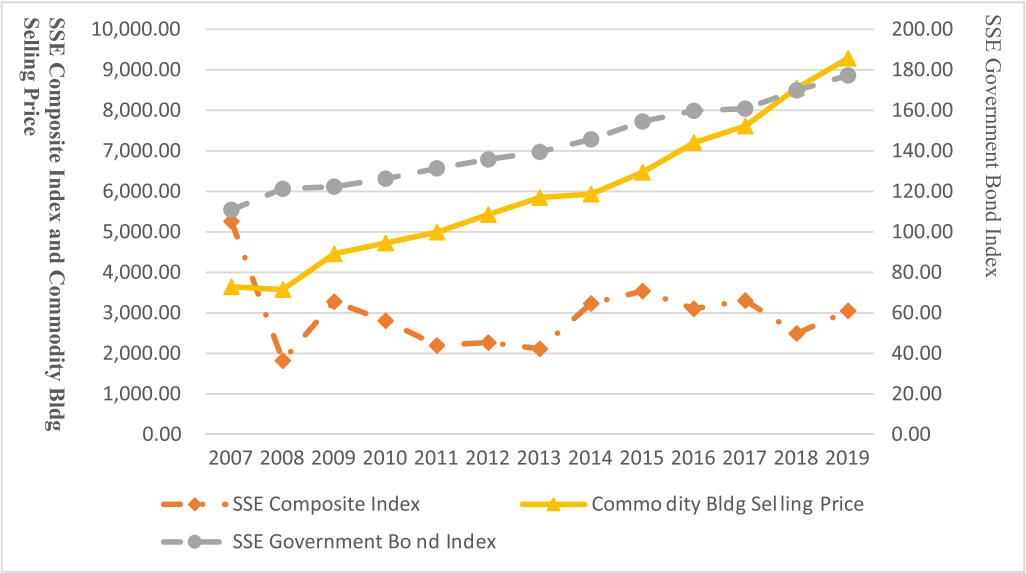


Fig. 1. SSE composite index, SSE government bond index and commodity bldg. selling price.

4.6. Extended analysis

In contrast to existing studies focusing on the profit-chasing mechanism, this paper approaches the phenomenon of corporate real estate investment from the perspective of changes in the external business environment, aiming for re-evaluation and reanalysis. Our analysis suggests that the risk aversion mechanism is a significant incentive for nonreal estate companies to invest in real estate. Given that corporate economic activities, especially investment actions, are highly susceptible to external uncertainties, our study measures the perception of economic environmental uncertainty through discussions and textual analysis by corporate management. It further analyses the intrinsic connection between the rise in policy uncertainty and the increasing trend of corporate investment in real estate. Our empirical findings indicate that an increase in economic policy uncertainty exacerbates the trend toward corporate real estate investment. We believe that the divergent effects of uncertainty on investment in real estate versus financial assets are closely related to the unique nature of the real estate market.

In recent years, the price of commercial housing in China has continuously risen, maintaining a long-term boom in the real estate market. Despite various regulatory measures, a pattern of "multiple regulations, multiple price rises" has emerged, while the financial market has underperformed. As illustrated in Fig. 1, the average sales price of national commercial residential properties surged by 134% during the same period. In contrast, capital market returns were limited, with the Shanghai Composite Index rising by only 40 points over more than a decade and the national debt index increasing by 52%. The capital market has experienced significant volatility, making real estate a safer asset class among various investment options.

From a corporate perspective, economic policy uncertainty leads to significant fluctuations in the stock market, potentially dampening companies' inclination toward investing and financing financial assets. On the other hand, market participants view real estate as a hedge asset; the intensification of external uncertainties highlights its hedging attributes, thereby attracting newcomers and prompting existing investors to expand their real estate investment portfolios. From the creditor's perspective, economic policy uncertainty increases the systemic risk of the financial system, causing banks to increase lending thresholds and reduce loan volumes, which intensifies corporate financing constraints, reduces the scale of corporate financial assets, and leads to a preference for real estate mortgages among banks.

Despite frequent regulatory policies, there are loopholes in the real estate market system. It can be argued that the rise of nonreal estate companies investing in real estate is closely linked to the lack of robust institutional arrangements in the real estate market. Between 2000 and 2010, the annual average growth rate of residential prices in China was 9.44%. To curb the rapid rise in housing prices, the State Council implemented the most stringent real estate control policy to date on April 17, 2010, which not only enacted strict differentiated housing credit policies but also required local governments to limit the number of housing purchases within a certain period based on actual conditions. Subsequent local restrictions targeted only the number of homes purchased by families without clear limitations on corporate purchases, leading to the widespread phenomenon of companies buying residential property in their names. For instance, at the launch of the luxury housing project Cuihu Tiandi in Shanghai on April 10, 2018, out of 118 housing units available, 214 corporate clients participated in the lottery, accounting for 55.6%. This demonstrates the insufficiency of "purchase restrictions" as an effective policy tool against corporate property purchases. In fact, the phenomenon of corporate property buying is common at the launch of popular locations across various regions. The data from listed companies show that from 2007 to 2018, the average proportion of investment in the financial assets of listed manufacturing firms reached 53.43%. It was not until the second half of 2018 that the issue of corporate property buying gradually garnered government attention. At the end of June, Xi'an was the first city to introduce a policy restricting corporate property purchases, suspending the sale of residential properties (including new and second-hand homes) to enterprises and institutions within restricted areas. In the following months, Xi'an, Changsha, Hangzhou, Shanghai, Shenzhen, Jiangyin, Nanjing, and other cities successively released related policies, but these policies varied in terms of restricted areas and subjects.

5. Conclusions

Our study examines a sample of A-share manufacturing companies listed on China's stock market from the first quarter of 2007 to the fourth quarter of 2019. We utilize textual analysis to quantitatively measure firm-level perception of uncertainty and empirically explore its impact on corporate real estate investment, along with the underlying mechanisms. The baseline regression results suggest that an increase in the perception of uncertainty leads firms to expand their real estate investments. Additionally, nonstate-owned firms and firms in highly marketized regions are more inclined to increase their real estate investments in response to economic uncertainty. Finally, risk aversion serves as a vital channel through which perception of uncertainty affects corporate real estate investment decisions.

Our study reveals several policy implications. First, the government should profoundly understand the significant impact of the interconnected macroeconomic environment, formed by domestic and international economic risks, on corporate investment and financing decisions. It is crucial to establish a value-centered benchmarking reconstruction system and a mechanism for swiftly stabilizing corporate expectations. Additionally, developing low-cost risk hedging and reinsurance strategies for enterprises to mitigate the effects of macroeconomic uncertainty is imperative. Second, the government should closely monitor the frequency, intensity, and transparency of economic policy formulation and adjustment, emphasizing policy continuity and predictability. A stable economic policy environment and a high degree of transparency in policy-making help reduce policy uncertainty, thereby ensuring that enterprises make more accurate investment decisions. Frequent adjustments in economic policies increase macroeconomic uncertainty, leading enterprises to reduce investments in their primary businesses and shift towards risk-averse and nonproductive investments. The government needs to be particularly mindful of the negative effects arising from policy uncertainty during the formulation and

implementation of economic policies. Finally, the coordination among policy systems and the precision of policy implementation need to be strengthened. Institutional flaws in the real estate market might induce investment-oriented real estate activities by enterprises in the capital market. It is essential not only to perfect the regulatory system of the real estate market and plug the related institutional gaps but also to enhance the governance of the capital market, improve its functions, and truly optimize resource allocation to promote industrial development.

This paper provides empirical evidence on how macroeconomic environments influence corporate real estate investments. However, there are several limitations in our study. First, we used word frequency data from corporate management discussions related to policy and uncertainty to measure corporate perceptions of uncertainty. The dictionary method employed may face certain issues: key terms might not be comprehensive, potentially omitting some real perceptions of uncertainty; additionally, some content might be misclassified as reflecting uncertainty. These issues could lead to biases in measuring corporate uncertainty perceptions. Therefore, refining the measurement of corporate uncertainty perception is an essential focus of future research. Second, our study does not cover the real estate market after the outbreak of COVID-19. Given the unusual economic fluctuations caused by COVID-19, future studies will specifically analyse the impact of the pandemic on the real estate market, providing new insights into market behaviors under extreme conditions. Finally, our study focused solely on publicly listed companies in the industrial sector, indicating that future research could explore real estate investment behaviors across other sectors.

CRediT authorship contribution statement

Fengfu Mao: Writing – review & editing, Supervision, Resources, Project administration, Funding acquisition, Conceptualization. **Yue Yuan:** Conceptualization, Methodology, Writing – review & editing. **Fan Zhang:** Writing – original draft, Visualization, Validation, Software, Methodology, Investigation, Formal analysis, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

This work was supported by the project of Economic Forecasting and Policy Simulation Laboratory, Zhejiang Gongshang University (No.2024SYS028).

Appendix

1. Policy Words

These terms are associated with governmental, regulatory, and economic policies that might influence market conditions and business environments. The complete list of terms include "municipal government," "policy," "monetary policy," "policy encouragement," "nation," "expand domestic demand," "ensure growth," "promote development," "industrial development," "law," "regulation," "industry policy," "industrial policy," "macro policy," "national economy," "relevant departments," "industrial structure adjustment," "industrial structure," "local government," "government," "economic policy," "policy trends," "income tax," "value-added tax," "tax relief," "tax incentives," "stimulus policy," "credit restrictions," "purchase limits," "affordable housing," "macro control," "industrial development," "Securities Regulatory Commission," "national policy," "politics," "military," "policy environment," "macro," "government subsidy policy," "control policy," "government subsidies," "tax policy," "policy support."

2. Uncertainty Words

These terms capture the essence of economic and operational instability and are crucial for assessing the level of uncertainty perceived in the environment. The complete list of terms include "risk," "operational risk," "market risk," "credit risk," "uncertainty," "fluctuation," "change," "waver," "instability," "unusual," "complex," "very complex," "intricately complex," "complicated," "become complex," "rapid changes," "contradictions," "sudden change," "complex and variable," "transitional pain," "accountability," "reorganization," "danger," "turmoil," "unstable," "volatile," "oscillate downwards," "shake," "political fluctuation," "difficult to determine," "difficult to predict," "difficult to foresee," "elusive," "under test," "chaos," "chaotic state," "sometimes," "occasionally," "random."

Note: The appendix includes lists of 'policy words' and 'uncertainty words' sourced from the study by Nie et al. (2020).

References

Aalbers, M., Haila, A.-K.E., 2018. The financialization of housing: A political economy approach. Urban Studies 55, 1821–1835. https://doi.org/10.1177/0042098018759251.

Abel, A.B., 1983. Optimal investment under uncertainty. Am. Econ. Rev. 73, 228–233. https://doi.org/10.2307/2329279.

Alam, A.W., Houston, R., Farjana, A., 2023. Geopolitical risk and corporate investment: How do politically connected firms respond? Financ. Res. Lett. 53, 103681. https://doi.org/10.1016/j.frl.2023.103681.

Ambrose, B.W., Diop, M., Yoshida, J., 2017. Product market competition and corporate real estate investment under demand uncertainty. Real Estate Econo. 45, 521–590. https://doi.org/10.1111/1540-6229.12150.
Arellano, C., Bai, Y., Kehoe, P.J., 2019. Financial frictions and fluctuations in volatility. J. Pol. Econ. 127, 2049–2103. https://doi.org/10.1086/701792.
Bahaj, S., Foulis, A., Pinter, G., 2020. Home values and firm behavior. Am. Econ. Rev. 110, 2225–2270. https://doi.org/10.1257/aer.20180649.
Baker, S.R., Bloom, N., Davis, S.J., 2016. Measuring economic policy uncertainty. Q. J. Econ. 131, 1593–1636.
Bansal, R., Yaron, A., 2004. Risks for the long run: a potential resolution of asset pricing puzzles. J. Finance 59, 1481–1509. https://doi.org/10.1111/j.1540-6261.2004.00670.x.
Bernanke, B.S., 1983. Irreversibility, uncertainty, and cyclical investment. Q. J. Econ. 98, 85–106. https://doi.org/10.2307/1885568.
Brennan, M.J., Schwartz, E.S., 1985. Evaluating natural resource investments. J. Bus. 58, 135–157. https://doi.org/10.1086/296288.
Caballero, R.J., Farhi, E., Gourinchas, P.-O., 2017. The safe assets shortage conundrum. J. Econ. Perspect. 31, 29–46. https://doi.org/10.1257/jep.31.3.29.
Chatterjee, S., Gu, X., Hasan, I., Lu, H., 2023. Ownership structure and the cost of debt: Evidence from the Chinese corporate bond market. J. Empir. Finance 73, 334–348. https://doi.org/10.1016/j.jempfin.2023.08.003.
Chen, Q., Kamran, S.M., Fan, H., 2019. Real estate investment and energy efficiency: Evidence from China's policy experiment. J. Clean. Prod. 217, 440–447. https://doi.org/10.1016/j.jclepro.2019.01.274.
Cheng, Z., Masron, T.A., 2024. Does economic policy uncertainty exacerbate corporate financialization? Evidence from China. Appl. Econ. Lett. 31, 1028–1036. https://doi.org/10.1080/13504851.2023.2168605.
Christiano, L., Motto, R., Rostagno, M., 2010. Financial factors in economic fluctuations. Working Paper Series, Working Paper Series.
Christiano, L.J., Motto, R., Rostagno, M., 2014. Risk shocks. Am. Econ. Rev. 104, 27–65. https://doi.org/10.1257/aer.104.1.27.
Çolak, G., Durnev, A., Qian, Y., 2017. Political uncertainty and IPO activity: evidence from U.S. gubernatorial elections. J. Financ. Quant. Anal. 52, 2523–2564. https://doi.org/10.1017/S0022109017000862.
Demir, F., 2009a. Financial liberalization, private investment and portfolio choice: financialization of real sectors in emerging markets. J. Dev. Econ. 88, 314–324. https://doi.org/10.1016/j.jdeveco.2008.04.002.
Demir, F., 2009b. Financial liberalization, private investment and portfolio choice: financialization of real sectors in emerging markets. J. Dev. Econ. 88, 314–324. https://doi.org/10.1016/j.jdeveco.2008.04.002.
Dong, F., Liu, J., Xu, Z., Zhao, B., 2021. Flight to housing in China. J. Econ. Dyn. Control 130, 104189. https://doi.org/10.1016/j.jedc.2021.104189.
Eraslan, S., 2016. Safe-haven demand for housing in London. Econ. Model. 58, 482–493. https://doi.org/10.1016/j.econmod.2015.12.022.
Fan, Z., Liu, K., 2022. Research on the development course and countermeasures of Chinese financial derivatives market. FBEM 3, 36–39. https://doi.org/10.54097/fbem.v3i3.313.
Firth, M., Gao, J., Shen, J., Zhang, Y., 2016. Institutional stock ownership and firms' cash dividend policies: Evidence from China. J. Bank. Financ. 65, 91–107. https://doi.org/10.1016/j.jbankfin.2016.01.009.
Geng, Y., Zheng, Z., Ma, Y., 2023. Digitization, perception of policy uncertainty, and corporate green innovation: a study from China. Econ. Anal. Policy. https://doi.org/10.1016/j.eap.2023.09.006. S0313592623002138.
Gilchrist, S., Sim, J.W., Zakrajšek, E., 2014. Uncertainty, financial frictions, and investment dynamics. Working Paper Series. https://doi.org/10.3386/w20038.
Gong, C.M., Gong, P., Jiang, M., 2023. Corporate financialization and investment efficiency: evidence from China. Pacific-Basin Finance J. 79, 102045. https://doi.org/10.1016/j.pacfin.2023.102045.
Gulen, H., Ion, M., 2016. Policy uncertainty and corporate investment. Rev. Financ. Stud. 29, 523–564.
Guo, Y., Huang, X., Peng, Y., 2020. How does house price influence monetary policy transmission? Int. Rev. Financ. Anal. 72, 101595. https://doi.org/10.1016/j.irfa.2020.101595.
Hartman, R., 1972. The effects of price and cost uncertainty on investment. J. Econ. Theory. 5, 258–266. https://doi.org/10.1016/0022-0531(72)90105-6.
Hoberg, G., Phillips, G., 2018. Conglomerate industry choice and product language. Manag. Sci. 64, 3735–3755. https://doi.org/10.1287/mnsc.2016.2693.
Huang, J., Luo, Y., Peng, Y., 2021. Corporate financial asset holdings under economic policy uncertainty: precautionary saving or speculating? Int. Rev. Econ. Finance 76, 1359–1378. https://doi.org/10.1016/j.iref.2019.11.018.
Jensen, M.C., Meckling, W.H., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. J. Financ. Econ. 3, 305–360. https://doi.org/10.1016/0304-405X(76)90026-X.
Jia, Z., Wen, S., Lin, B., 2024. Would behaviors of state-owned enterprises impact the performance of downstream industries in China? Econ. Anal. Policy. 81, 1007–1035. https://doi.org/10.1016/j.eap.2024.01.015.
Jiang, F., Jiang, Z., Kim, K.A., 2020. Capital markets, financial institutions, and corporate finance in China. J. Corporate Finance, Capital Markets, Financial Inst., Corp. Finance China 63, 101309. https://doi.org/10.1016/j.jcorpfin.2017.12.001.
Jiang, Y., Zheng, Y., Fan, W., Wang, X., 2024. Peer digitalization and corporate investment decision. Financ. Res. Lett. 61, 104995. https://doi.org/10.1016/j.frl.2024.104995.
Jordà, Ò., Knoll, K., Kuvshinov, D., Schularick, M., Taylor, A.M., 2019. The rate of return on everything, 1870–2015. Q. J. Econ. 134, 1225–1298. https://doi.org/10.1093/qje/qjz012.
Julio, B., Yook, Y., 2012. Political uncertainty and corporate investment cycles. J. Finance 67, 45–83. https://doi.org/10.1111/j.1540-6261.2011.01707.x.
Kelly, B., Pástor, Ľ., Veronesi, P., 2016. The price of political uncertainty: theory and evidence from the option market. J. Finance 71, 2417–2480. https://doi.org/10.1111/jofi.12406.
Kou, Z., Tang, Y., Wu, H., Zhou, M., 2023. Ownership, volatility, and equity incentives: theory and evidence from listed companies in China. Econ. Model. 128, 106470. https://doi.org/10.1016/j.econmod.2023.106470.
Kuang, W., Chen, C., Wang, Q., 2020. Home purchase restriction, real estate investment, and corporate innovation. Front. Bus. Res. China 14, 24. https://doi.org/10.1186/s11782-020-00091-5.
Launius, S., Kear, M., 2019. Fixing financialization in the credit-constrained city. Urban. Geogr. 40, 1335–1355. https://doi.org/10.1080/02723638.2019.1586220.
Le, Q.V., Zak, P.J., 2006. Political risk and capital flight. J. Int. Money. Finance 25, 308–329.
Li, S., Zhan, Shuwei, Zhan, Shurui, Zhan, M., 2023. How does financial development change the effect of the bank lending channel of monetary policy in developing countries?—Evidence from China. Int. Rev. Econ. Finance 85, 502–519. https://doi.org/10.1016/j.iref.2023.02.001.
Liang, F., Tian, G.G., Wei, Z., Zeng, A., 2024. All that glitters is not gold: examining the negative impact of real estate value on companies' market competitiveness. J. Real Estate Finan. Econ. https://doi.org/10.1007/s11146-024-09981-4.
Lin, Y.R., Fu, X.M., 2017. Does institutional ownership influence firm performance? Evidence from China. Int. Rev. Econ. Finance 49, 17–57. https://doi.org/10.1016/j.iref.2017.01.021.
Liu, G., Zhang, C., 2020. Economic policy uncertainty and firms' investment and financing decisions in China. China Econ. Rev. 63, 101279. https://doi.org/10.1016/j.chieco.2019.02.007.
Liu, X., Cifuentes-Faura, J., Zhao, S., Wang, L., 2024. The impact of government environmental attention on firms' ESG performance: evidence from China. Res. Int. Bus. Finance 67, 102124. https://doi.org/10.1016/j.ribaf.2023.102124.
Liu, X., Lv, L., 2023. The effect of China's low carbon city pilot policy on corporate financialization. Financ. Res. Lett. 54, 103787. https://doi.org/10.1016/j.frl.2023.103787.
Liu, Y., Gao, Q., 2024. Economic policy uncertainty and enterprise innovation in China: from the perspective of equity financing and financing structure. Econ. Anal. Policy. 81, 17–33. https://doi.org/10.1016/j.eap.2023.11.026.
Loughran, T., Mcdonald, B., 2014. Measuring readability in financial disclosures. J. Finance 69, 1643–1671. https://doi.org/10.1111/jofi.12162.
Loughran, T., Mcdonald, B., 2011. When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. J. Finance 66, 35–65. https://doi.org/10.1111/j.1540-6261.2010.01625.x.

Lu, B., Tan, X., Zhang, J., 2019. The crowding out effect of booming real estate markets on corporate TFP: evidence from China. Account. Finance 58, 1319–1345. https://doi.org/10.1111/acfi.12451.
Lu, C., Yang, M., Xia, X., 2023. Economic policy uncertainty and default risk: evidence from China. Econ. Anal. Policy. 79, 821–836. https://doi.org/10.1016/j.eap.2023.06.028.
Lu, C., Zhu, T., Xia, X., Zhao, Z., Zhao, Y., 2024. Common institutional ownership and corporate green investment: evidence from China. Int. Rev. Econ. Finance 91, 1123–1149. https://doi.org/10.1016/j.iref.2024.01.072.
Luo, H., Wu, Y., 2023. The unintended consequences of environmental tax for green innovation: evidence from China. J. Appl. Econ. 26, 2286566. https://doi.org/10.1080/15140326.2023.2286566.
McDonald, R., Siegel, D., 1986. The value of waiting to invest. Q. J. Econ. 101, 707–727. https://doi.org/10.2307/1884175.
Nie, H., Ruan, R., Shen, J., 2020. Firm-level economic policy uncertainty, firms' investment and financial assets. SSRN J. https://doi.org/10.2139/ssrn.3714229.
Oi, W.Y., 1961. The desirability of price instability under perfect competition. Econometrica 29, 58–64. https://doi.org/10.2307/1907687.
Panousi, V., Papanikolaou, D., 2012. Investment, idiosyncratic risk, and ownership. J. Finance 67, 1113–1148. https://doi.org/10.1111/j.1540-6261.2012.01743.x.
Qi, Y., Yang, Y., Yang, S., Lyu, S., 2021. Does government funding promote or inhibit the financialization of manufacturing enterprises? Evidence from listed Chinese enterprises. North Am. J. Econ. Finance 58, 101463. https://doi.org/10.1016/j.najef.2021.101463.
Schuur, R.G., 2016. Corporate real estate: strategic and leadership challenges. Pepperdine University.
Shen, Z., Sun, S., Zhu, Y., 2024. Shadow banking, credit term structure, and financialization of manufacturing firms. Financ. Res. Lett. 60, 104861. https://doi.org/10.1016/j.frl.2023.104861.
Shu, J., Zhang, C., Zheng, N., 2020. Financialization and sluggish fixed investment in Chinese real sector firms. Int. Rev. Econ. Finance 69, 1106–1116. https://doi.org/10.1016/j.iref.2018.12.008.
Si, D.-K., Zhuang, J., Ge, X., Yu, Y., 2024. The nexus between trade policy uncertainty and corporate financialization: evidence from China. China Econ. Rev. 84, 102113. https://doi.org/10.1016/j.chieco.2024.102113.
Smith, C.W., Stulz, R.M., 1985. The determinants of firms' hedging policies. J. Financ. Quant. Anal. 20, 391–405. https://doi.org/10.2307/2330757.
Sun, X., Gunia, B.C., 2018. Economic resources and corporate social responsibility. J. Corp. Finance 51, 332–351. https://doi.org/10.1016/j.jcorpfin.2018.06.009.
Vo, H., Nguyen, T., Truong, H., 2023. Economic policy uncertainty and corporate investment: an empirical comparison of Korean chaebol and non-chaebol firms. Financ. Res. Lett. 54, 103810. https://doi.org/10.1016/j.frl.2023.103810.
Wang, C., Wang, L., Zhao, S., Yang, C., Albitar, K., 2024. The impact of Fintech on corporate carbon emissions: towards green and sustainable development. Bus. Strategy. Environ. https://doi.org/10.1002/bse.3778 n/a.
Wang, L., Wu, Y., Huang, Z., Wang, Y., 2024. Big data application and corporate investment decisions: evidence from A-share listed companies in China. Int. Rev. Financ. Anal. 103331. https://doi.org/10.1016/j.irfa.2024.103331.
Wang, Q., Hu, C., 2023. Fintech, financial regulation and corporate financialization: evidence from China. Financ. Res. Lett. 58, 104378. https://doi.org/10.1016/j.frl.2023.104378.
Wang, S., Yang, D.Y., 2021. Policy Experimentation in China: the Political Economy of Policy Learning (Working Paper No. 29402), Working Paper Series. National Bureau of Economic Research. https://doi.org/10.3386/w29402.
Wang, Y., Chen, C.R., Ying, S.H., 2014. Economic policy uncertainty and corporate investment: evidence from China. Pacific-Basin Finance J. 26, 227–243. https://doi.org/10.1016/j.pacfin.2013.12.008.
Wu, X., Ma, J., Gao, Y., Li, B., Chen, X., Song, M., 2023. Policy uncertainty and air pollution: evidence from the turnover of local officials in China. Econ. Anal. Policy. 80, 532–543. https://doi.org/10.1016/j.eap.2023.08.017.
Yang, A., Li, W., Teo, B.S.X., Othman, J., 2023. The impact of financial derivatives on the enterprise value of chinese listed companies: moderating effects of managerial characteristics. Int. J. Financ. Stud. 11, 2. https://doi.org/10.3390/ijfs11010002.
Yang, Z., Yu, Y., Zhang, Y., Zhou, S., 2019. Policy uncertainty exposure and market value: evidence from China. Pacific-Basin Finance J. 57, 101178. https://doi.org/10.1016/j.pacfin.2019.101178.
Yu, Z., Xiao, Y., Li, J., 2021. Firm-level perception of uncertainty and innovation activity: textual evidence from China's A-share market. Pacific-Basin Finance J. 68, 101555. https://doi.org/10.1016/j.pacfin.2021.101555.
Zhou, L., Chen, P., 2024. Economic policy uncertainty and corporate cooperative research and development: empirical evidence based on chinese patent data. Financ. Res. Lett., 105806 https://doi.org/10.1016/j.frl.2024.105806.