

Economic Policy Uncertainty and the Financing Structure of STAR Market Listed Companies

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Abstract: This paper examines the association between economic policy uncertainty (EPU) and the financing structure of firms listed on China's STAR Market. Based on 584 firms and 2,039 firm-year observations from 2022 to 2025, the study combines firm-level financial statement data with the Chinese Mainland EPU index and annual GDP growth data. The empirical results show that EPU is positively associated with corporate leverage and the debt-to-equity ratio after controlling for firm characteristics, industry effects, and the macroeconomic cycle. A one-standard-deviation increase in LnEPU is associated with an increase of approximately 0.22 percentage points in the leverage ratio, suggesting that the estimated economic magnitude is moderate but meaningful for firms operating under continuous innovation-financing pressure. Further tests indicate that the positive association is more evident in total debt dependence than in debt maturity adjustment. In particular, EPU does not significantly affect the long-term debt ratio or the debt maturity structure, which reflects the limited availability of long-term debt financing for many technology-oriented firms. Firm fixed-effects regressions and exploratory interaction tests provide more cautious evidence, indicating that the findings should be interpreted as association rather than strong causal identification. The paper contributes to the literature by providing focused evidence from China's registration-based STAR Market and by highlighting how innovation-oriented firms may adjust financing structures when policy uncertainty rises.

Keywords: Economic Policy Uncertainty, STAR Market, Financing Structure, Leverage, Debt Financing, Capital Structure

1. Introduction

China's STAR Market was launched to strengthen the ability of the capital market to support sci-tech innovation-oriented enterprises. Compared with firms listed on traditional boards, STAR Market firms are generally characterized by high growth opportunities, strong dependence on external financing, and a larger share of intangible assets. These features make their financing decisions sensitive to macroeconomic expectations, investor sentiment, and credit conditions.

Economic policy uncertainty has become an important macro-level factor affecting corporate financial decisions. When policy uncertainty rises, investors and financial institutions may reassess future demand, regulatory conditions, financing costs, and project risks. Prior studies show that uncertainty shocks can influence investment, employment, and corporate financing behavior [1][2][5][17]. However, the direction of the effect on leverage is not theoretically obvious. Firms may reduce leverage to avoid financial distress, or they may increase debt when equity financing becomes more costly and internal funds are insufficient.

This ambiguity is particularly relevant for STAR Market firms. Innovation projects often require continuous R&D expenditures and long development cycles. If uncertainty raises the cost of equity capital, firms may turn to debt financing to smooth R&D and operating activities. At the same time, technology firms often have weaker collateral bases and may face credit rationing when banks become more cautious. Therefore, whether EPU is associated with higher or lower leverage among STAR Market firms is an empirical question.

The STAR Market offers a useful research setting because its listed firms combine strong innovation demand with relatively young organizational age and high reliance on external capital markets. Many firms on this board have substantial R&D expenditures, high valuation uncertainty, and

limited collateralizable assets. These features make the conventional leverage response to uncertainty less obvious. On the one hand, high uncertainty may induce firms to reduce debt and protect financial flexibility. On the other hand, if uncertainty reduces the feasibility or attractiveness of equity financing, firms with continuing R&D commitments may increase debt financing to maintain operating and innovation activities. This institutional setting therefore allows the paper to examine whether the debt-substitution mechanism dominates the precautionary deleveraging mechanism in a specific innovation-financing environment.

This paper uses annual data on STAR Market listed companies from 2022 to 2025 and the Chinese Mainland EPU index to examine the relationship between EPU and financing structure. Unlike broad samples of all listed firms, the STAR Market sample focuses on a board designed for innovation-oriented enterprises. This setting allows the paper to examine whether policy uncertainty affects the financing structure of firms whose development depends heavily on external capital and R&D continuity.

The paper makes three contributions. First, it provides evidence from a focused group of innovation-oriented listed firms, complementing studies that use broader samples of listed companies. The STAR Market is not merely a sub-sample of the A-share market; it is a market segment established to support hard-technology enterprises under the registration-based reform. Second, the paper connects macro policy uncertainty with financing-structure adjustment and explicitly recognizes the coexistence of precautionary deleveraging and debt-substitution logic. This is important because prior research has not reached a unified conclusion on whether EPU raises or lowers leverage. Third, the paper provides practical implications for firms, financial institutions, and regulators. If higher policy uncertainty is associated with greater debt dependence but not with a better debt maturity structure, then the key policy issue is not only whether technology firms can obtain funds, but also whether they can obtain stable and patient funds.

2. Literature Review and Hypothesis Development

2.1. Literature Review

Capital-structure research originates from the Modigliani-Miller theorem [12]. Later studies introduced taxes, bankruptcy costs, agency problems, and information asymmetry to explain financing choices. The trade-off theory argues that firms balance tax benefits of debt against distress costs, while the pecking-order theory emphasizes internal funds, debt, and equity as a financing hierarchy under asymmetric information [13]. Empirical studies further show that profitability, size, asset tangibility, growth opportunities, and industry characteristics are closely related to leverage [4][15][19].

Empirical capital-structure studies further show that leverage is jointly affected by firm size, profitability, asset tangibility, growth opportunities, and industry characteristics [4][15][16][19]. Large firms often have lower information asymmetry and stronger credit access, while profitable firms may rely more on internal funds. Tangible assets can be pledged as collateral and therefore improve debt capacity. Growth opportunities, however, may reduce leverage when firms avoid the underinvestment problem associated with risky debt. These classic determinants are still relevant for STAR Market firms, but their effects may be reshaped by the special nature of innovation assets. For example, R&D assets are economically valuable but difficult to pledge, which weakens the traditional collateral channel.

For innovation-oriented firms, however, standard capital-structure mechanisms may operate differently. R&D projects are difficult for outsiders to value and often involve high adjustment costs. This increases information asymmetry in equity markets and weakens the collateral value available to creditors. Consequently, high-tech firms may rely on external financing while simultaneously facing stronger financing frictions.

EPU has been widely used to explain corporate financial behavior. Baker, Bloom and Davis [1] constructed a news-based EPU index and showed that policy uncertainty is related to fluctuations in investment, output, and employment. Studies on China have also developed and applied EPU measures based on newspaper information [3][7]. Existing research suggests that EPU can reduce corporate investment, increase cash holdings, affect debt maturity, and change the cost of external financing [5][8][10][11][18].

In corporate finance, EPU can influence firms through several channels. It may increase the option value of waiting and reduce investment [2][5][17]. It may also intensify information asymmetry between firms and outside investors, making external financing more expensive. For debt markets, policy uncertainty can either tighten credit supply through greater risk aversion or increase credit demand when firms seek to smooth cash flows. For equity markets, uncertainty can reduce investor confidence and raise expected returns, which may discourage equity issuance. Therefore, the same macro shock may lead to different financing responses depending on firm characteristics and market institutions.

Nevertheless, the literature has not reached a consistent conclusion on the relationship between EPU and leverage [9]. One view emphasizes precautionary deleveraging: when uncertainty rises, firms reduce debt to avoid financial distress. Another view emphasizes financing substitution: when equity financing becomes more costly and internal funds are insufficient, firms may increase debt. Existing studies often focus on the whole market, while targeted evidence for the STAR Market remains limited.

Research on the STAR Market has emphasized registration-based reform, market valuation, R&D investment, and financing constraints. However, less attention has been paid to how macro policy uncertainty is associated with the financing structure of STAR Market firms after the initial stage of board establishment. This gap is important because the STAR Market is expected to support innovation financing, yet its listed firms may still rely heavily on short-term liabilities.

Based on these strands of literature, this paper identifies two gaps. First, the relationship between EPU and leverage remains empirically mixed, especially in emerging markets where government policy, credit allocation, and capital-market reforms interact. Second, relatively few studies examine this relationship within the STAR Market, a board specifically designed for innovation-oriented firms. By focusing on the post-establishment period of the STAR Market and using updated firm-year observations, this paper provides additional evidence on how macro uncertainty is reflected in the financing decisions of technology firms.

The existing STAR Market literature mainly focuses on IPO pricing, registration-system reform, R&D disclosure, valuation efficiency, and technology innovation incentives. Compared with the main board, STAR Market firms are typically younger, more R&D-intensive, and more sensitive to changes in investor expectations. They also face a contradiction between high growth potential and limited, unstable cash flows. This contradiction makes the financing-structure response to macro uncertainty a meaningful question. A study based on the whole market may hide this mechanism because mature firms, state-owned enterprises, and low-growth firms have different financing constraints and policy sensitivities.

2.2. Theoretical Analysis and Main Hypothesis

EPU may influence financing structure through competing channels. From the precautionary perspective, rising uncertainty increases the probability of future cash-flow volatility and financial distress. Firms may therefore reduce leverage and preserve financial flexibility. This prediction is consistent with the view that uncertainty discourages irreversible investment and raises the value of waiting [2][17].

The opposite prediction comes from a debt-substitution perspective. First, EPU increases information asymmetry and raises the risk premium required by equity investors. For technology firms whose value depends on uncertain innovation projects, equity financing may become more costly. Second, R&D smoothing creates relatively rigid financing demand. Once R&D projects are interrupted, firms may lose accumulated technological knowledge, market timing, or research teams. Third, policy-supported technology credit may partly buffer the general credit contraction faced by innovative firms. These channels may induce firms to use more debt when uncertainty rises.

The precautionary mechanism should not be ignored. A firm facing higher uncertainty may choose to reduce leverage in order to avoid financial distress, especially if its cash flow is volatile and its asset base is weak. This mechanism is particularly relevant for small firms or firms with severe financing constraints. The empirical sign of EPU therefore depends on the relative strength of debt substitution and precautionary deleveraging. The hypothesis in this paper is formulated for the average effect in the STAR Market sample, while possible cross-firm differences are examined as exploratory heterogeneity rather than as core hypotheses.

More specifically, the debt-substitution mechanism can be understood from three perspectives. The first is the equity-financing cost channel. When EPU rises, outside investors have greater difficulty evaluating future policy direction, market demand, and the value of innovation projects. Since STAR Market firms often derive value from intangible technologies and future growth opportunities, the valuation discount in equity markets may become larger under uncertainty. Equity financing may therefore become more costly or less feasible. The second is the R&D-smoothing channel. Innovation projects usually cannot be suspended without cost; interruption may lead to loss of technical personnel, delay of product development, and weakening of first-mover advantages. Even when uncertainty increases, firms may need to maintain minimum R&D and operating expenditures. The third is the credit-supply support channel. Although commercial banks may become cautious during uncertain periods, policy-oriented credit support for technology firms, intellectual-property pledge financing, and local government innovation-support programs may partially offset the decline in general credit supply. These factors may make debt financing relatively more accessible than equity financing for some STAR Market firms.

The coexistence of these two mechanisms makes the sign of the EPU-leverage relationship theoretically ambiguous. In the STAR Market context, however, high growth opportunities, R&D continuity, and insufficient internal funds may strengthen the debt-substitution motive. Therefore, this paper proposes the following main hypothesis:

H1: Economic policy uncertainty is positively associated with the level of debt financing among STAR Market listed companies.

Firm size and financing constraints may also shape the above relationship. However, because the sample period is short and the macro variable varies only by year, these differences are treated as exploratory heterogeneity rather than core hypotheses. The paper therefore reports interaction tests in the empirical section but avoids treating statistically insignificant interaction terms as evidence against the main argument.

3. Research Design

3.1. Sample Selection and Data Sources

The sample consists of STAR Market listed firms from 2022 to 2025. Financial statement data are obtained from balance sheets, income statements, and annual listed-company information tables. EPU data are obtained from the monthly Chinese Mainland Economic Policy Uncertainty Index [14], which is transformed into an annual average and then log-transformed. To control for the macroeconomic cycle, annual GDP growth is added as a macro control variable. GDP growth data are obtained from official statistical sources and the World Bank database [20][21].

The sample is processed as follows. First, only STAR Market annual observations are retained. Second, consolidated financial statements are used. Third, observations with ST, *ST, or delisting labels are excluded. Fourth, observations with missing or abnormal values in key variables are removed. The final sample contains 584 firms and 2,039 firm-year observations. The regression period starts from 2022 to reduce the influence of early IPO-year financing, because IPO proceeds may mechanically increase equity and lower leverage.

Although the time dimension is relatively short, the cross-sectional coverage is broad and reflects the financing behavior of STAR Market firms after the initial establishment period. The short time dimension is a limitation of the research design and is explicitly considered in the interpretation of the results.

The choice of 2022-2025 is also intended to avoid the most unstable initial years of the STAR Market. The board was launched in 2019, and the earliest years contain fewer listed firms and stronger IPO-year effects. IPO-year financing can mechanically depress leverage because equity proceeds are large and balance-sheet structures are temporarily affected by listing. Starting from 2022 helps focus on relatively regular post-listing financing behavior while preserving a sufficiently broad cross-section of firms.

3.2. Variable Definition

The main dependent variable is leverage (Lev), measured as total liabilities divided by total assets. Two additional financing-structure variables are used: short debt-to-assets ratio (Short), measured as current liabilities divided by total assets, and debt-to-equity ratio (ER), measured as total liabilities divided by owners' equity. To distinguish maturity structure from short debt intensity, this paper also uses debt maturity structure, measured as current liabilities divided by total liabilities, and long-term debt ratio, measured as non-current liabilities divided by total assets.

The distinction among these dependent variables is important. Lev captures the overall debt dependence of a firm. Short captures the intensity of short-term liabilities relative to total assets, while DebtMaturity captures the composition of debt by measuring the share of current liabilities in total liabilities. LongLev captures the role of long-term debt financing. Using these variables together allows the paper to separate the question of whether firms use more debt from the question of whether they obtain longer-maturity debt. This is especially relevant for technology firms because they may need long-term funds for R&D but often rely heavily on short-term liabilities.

The core explanatory variable is LnEPU, defined as the natural logarithm of the annual average of the Chinese Mainland EPU index. The robustness section uses the annual geometric mean of EPU as an alternative measure. Control variables include firm size (Size), profitability (ROA), growth (Growth), cash holdings (Cash), asset tangibility (Tang), firm age (Age), and GDP growth (GDPGrowth).

Firm-level controls are selected according to capital-structure theory and the availability of consistent data. Size controls for firm scale and credit capacity. ROA controls for internal financing ability. Growth captures expansion demand and growth opportunities. Cash reflects liquidity reserves and the ability to absorb shocks. Tang captures collateral capacity. Age reflects firm maturity and information accumulation. GDPGrowth is added as a parsimonious macro control to reduce the concern that LnEPU only proxies for the business cycle. The model does not include a large set of macro controls because the sample contains only four years and adding highly correlated annual variables would reduce estimation stability.

Financing constraints are measured using the SA index proposed by Hadlock and Pierce [6]. Specifically, $SA = -0.737 \times \text{Size} + 0.043 \times \text{Size}^2 - 0.04 \times \text{Age}$. Since a lower original SA value generally indicates stronger financing constraints, this paper multiplies the SA index by -1 to construct FC; a higher FC value indicates stronger financing constraints. Table 1 summarizes the definitions and measurements of all variables used in the empirical analysis.

Table 1: Variable Definitions.

Variable	Definition	Description
Lev	Total liabilities / total assets	Main financing-structure variable
Short	Current liabilities / total assets	Short debt-to-assets ratio
ER	Total liabilities / owners' equity	Debt-to-equity ratio
DebtMaturity	Current liabilities / total liabilities	Debt maturity structure
LongLev	Non-current liabilities / total assets	Long-term debt ratio
LnEPU	ln(annual average EPU index)	Core explanatory variable
GDPGrowth	Annual GDP growth rate (%)	Macroeconomic control
Size	ln(total assets)	Firm scale
ROA	Net profit / total assets	Profitability
Growth	Revenue growth rate	Growth opportunity
Cash	Monetary funds / total assets	Cash holdings
Tang	Fixed assets / total assets	Asset tangibility
Age	ln(firm age in years)	Firm age
FC	-SA index	Financing constraints

3.3. Model Specification

The baseline model is specified as follows:

$$Y_{it} = \alpha + \beta \text{LnEPU}_{it} + \gamma \text{Controls}_{it} + \delta \text{GDPGrowth}_{it} + \text{Industry}_i + \varepsilon_{it} \quad (1)$$

where Y_{it} denotes the financing-structure variable of firm i in year t . LnEPU_{it} is the annual EPU measure, and Controls_{it} denotes the vector of firm-level control variables. Industry fixed effects are included to control for stable industry differences. Because LnEPU is an annual macro-level variable

and takes the same value for all firms in the same year, year fixed effects are not included; otherwise, the EPU variable would be fully absorbed.

A key econometric issue is that EPU varies only over time. To reduce the risk that EPU simply captures the business cycle, GDPGrowth is included as a macro control variable. Standard errors are clustered at the industry-year level to account for the aggregate nature of the explanatory variable and within-cluster correlation. Firm fixed-effects regressions are further reported as a stricter check. Given the short time dimension and the macro nature of EPU, all results are interpreted as association evidence rather than definitive causal estimates.

The use of industry-year clustered standard errors is also motivated by the aggregated nature of the core explanatory variable. Since LnEPU is common to all firms within a year, standard errors clustered only at the firm level may understate uncertainty. Clustering at the industry-year level allows residual correlation among firms operating in the same industry-year environment and provides a more cautious inference framework for this macro-micro panel setting. Firm fixed-effect regressions are further used to examine whether the baseline association survives the absorption of time-invariant firm characteristics.

This modeling choice reflects a trade-off. Including year fixed effects would fully absorb the annual variation in EPU and make the coefficient unidentified. Excluding year fixed effects, however, means that other year-level forces may still influence the result. To reduce this concern, the paper includes GDPGrowth and uses robustness checks based on alternative EPU measures and sub-samples. The results are interpreted conservatively as evidence of association. The paper does not claim that the short annual panel fully identifies a causal effect of EPU.

4. Empirical Results

4.1. Descriptive Statistics

Table 2 reports descriptive statistics. The average leverage ratio is 0.303, indicating that STAR Market firms generally maintain relatively low leverage. The average short debt-to-assets ratio is 0.234, while current liabilities account for 79.6% of total liabilities on average. The average long-term debt ratio is only 0.069, which suggests that long-term debt plays a limited role in the financing structure of STAR Market firms.

The descriptive results are consistent with the financing characteristics of high-technology firms. The relatively low average leverage indicates that many STAR Market firms still rely substantially on equity and retained earnings. However, the high share of current liabilities in total liabilities indicates that when these firms use debt, they tend to rely on short-maturity financing. This pattern creates a maturity mismatch risk because innovation investment often requires a longer payback period than current liabilities provide. The descriptive evidence therefore already suggests that the key issue for STAR Market firms is not only the amount of financing but also the stability of financing sources.

Table 2: Descriptive Statistics.

Variable	N	Mean	Std. Dev.	Min	Max
Lev	2039	0.3027	0.1898	0.0362	0.7829
Short	2039	0.2342	0.1547	0.0278	0.6700
ER	2039	0.5906	0.6366	0.0358	3.3664
DebtMaturity	2039	0.7963	0.1748	0.2714	0.9966
LongLev	2039	0.0686	0.0829	0.0005	0.3779
LnEPU	2039	5.7024	0.1833	5.4541	5.9385
GDPGrowth	2039	4.6639	0.8174	3.0000	5.2000
Size	2039	21.8374	0.9076	20.2191	24.8808
ROA	2039	0.0156	0.0751	-0.2675	0.2155
Growth	2039	0.1388	0.4019	-0.6782	2.3485
Cash	2039	0.2347	0.1615	0.0285	0.7849
Tang	2039	0.1669	0.1279	0.0036	0.5616
Age	2039	2.8699	0.3206	1.9459	3.5835
FC	2039	3.8484	0.2336	3.3688	4.5563

4.2. Baseline Regression Results

Table 3 presents the baseline results after controlling for firm characteristics, industry fixed effects, and annual GDP growth. In column (1), the coefficient of LnEPU is 0.0119 and statistically significant at the 5% level. Economically, a one-standard-deviation increase in LnEPU is associated with an increase of about 0.22 percentage points in the leverage ratio. Although the magnitude is moderate, it is meaningful given the relatively low average leverage of STAR Market firms.

The positive coefficient on LnEPU should be understood as a net effect. It does not mean that all firms increase debt when uncertainty rises, nor does it imply that debt financing becomes easier for every firm. Rather, it indicates that, on average, the observed financing structure shifts in a direction consistent with greater debt dependence. In the STAR Market context, this is compatible with the argument that equity financing becomes more difficult or less attractive under uncertainty, while firms still need to maintain innovation and operating expenditures.

The signs of control variables are generally in line with capital-structure theory. Larger firms tend to have higher leverage because they have stronger credit capacity and more stable operations. More profitable firms tend to have lower leverage, consistent with the pecking-order argument that internal funds reduce the need for debt. Cash holdings are negatively associated with leverage, indicating that firms with greater liquidity reserves rely less on external debt. These patterns support the validity of the regression design and show that the model captures standard firm-level determinants of financing structure.

The results for Short and ER are directionally consistent, although the coefficient for Short is not statistically significant at conventional levels. GDPGrowth is negatively associated with leverage and short debt usage, indicating that macroeconomic conditions matter for financing structure. The inclusion of GDPGrowth helps reduce the concern that the estimated EPU coefficient merely reflects the business cycle.

Table 3: Baseline Results with GDP Growth Control.

Variable	Lev	Short	ER
LnEPU	0.0119** (2.01)	0.0090 (1.58)	0.0580** (1.97)
GDPGrowth	-0.0090*** (-4.54)	-0.0089*** (-4.97)	-0.0170 (-1.62)
Size	0.0720*** (15.18)	0.0459*** (10.32)	0.2334*** (10.01)
ROA	-0.8201*** (-11.31)	-0.5614*** (-8.95)	-2.6963*** (-8.08)
Growth	0.0648*** (7.15)	0.0457*** (5.36)	0.1794*** (4.17)
Cash	-0.2977*** (-8.05)	-0.2654*** (-8.09)	-0.8295*** (-6.69)
Tang	0.1143* (1.81)	-0.1122** (-2.33)	0.2649 (1.21)
Age	0.0576*** (5.33)	0.0540*** (5.80)	0.1306*** (3.52)
Industry FE	Yes	Yes	Yes
Observations	2039	2039	2039
Adjusted R-squared	0.406	0.339	0.357

Notes: *t*-statistics in parentheses. Standard errors are clustered at the industry-year level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

4.3. Robustness and Additional Checks

Table 4 reports robustness checks. The coefficients of LnEPU are not significant for debt maturity structure and long-term debt ratio. This finding suggests that EPU is associated more with total debt dependence than with a clear adjustment between short-term and long-term debt. The result is economically interpretable because long-term debt accounts for only 6.9% of total assets on average; many STAR Market firms may have limited access to long-term credit due to low asset tangibility and uncertain innovation returns.

The insignificant maturity-structure result is not simply a failure of the empirical design. It provides useful information about the financing environment of STAR Market firms. If firms had broad access

to both short-term and long-term credit, an uncertainty shock might lead them to adjust maturity composition. The absence of such a response suggests that the maturity menu available to many firms is limited. In other words, firms may increase debt dependence without being able to improve the maturity structure of debt. This distinction is important for policy because an increase in leverage accompanied by continued reliance on short-term liabilities may increase liquidity risk.

When the annual geometric mean of EPU is used, the coefficient remains positive and significant. After excluding 2022, the coefficient also remains positive and significant. These tests suggest that the baseline result is not purely driven by the arithmetic construction of EPU or by the special conditions of 2022.

Table 4: Robustness Checks.

Variable	DebtMaturity	LongLev	Lev (GeoEPU)	Lev (Excl. 2022)
LnEPU	-0.0093 (-0.66)	0.0025 (0.48)	-	0.0124*** (2.71)
LnEPU_geo	-	-	0.0118** (2.00)	-
GDPGrowth	-0.0032 (-1.38)	-0.0001 (-0.10)	-0.0089*** (-4.47)	0.0230 (1.62)
Size	-0.0342*** (-8.00)	0.0256*** (15.63)	0.0720*** (15.18)	0.0739*** (13.83)
ROA	0.2890*** (5.30)	-0.2746*** (-9.04)	-0.8201*** (-11.31)	-0.8632*** (-10.54)
Growth	-0.0220* (-1.81)	0.0209*** (3.33)	0.0648*** (7.15)	0.0608*** (5.54)
Cash	-0.0035 (-0.17)	-0.0318*** (-3.83)	-0.2977*** (-8.05)	-0.2913*** (-7.10)
Tang	-0.4612*** (-10.90)	0.2293*** (9.98)	0.1143* (1.81)	0.1319* (1.83)
Age	0.0189** (2.12)	0.0052 (1.27)	0.0576*** (5.33)	0.0591*** (5.01)
Industry FE	Yes	Yes	Yes	Yes
Observations	2039	2039	2039	1646
Adjusted R-squared	0.240	0.330	0.406	0.398

Notes: *t*-statistics in parentheses. Standard errors are clustered at the industry-year level.

Table 5 further examines whether the leverage increase reflects actual debt expansion or passive changes in equity. LnEPU is positively associated with the logarithm of total liabilities, but the coefficient is not statistically significant after GDPGrowth and controls are included. The coefficient of LnEPU in the equity-growth regression is positive and significant, indicating that the leverage result should not be over-interpreted as pure active debt substitution. Rather, the evidence supports a cautious interpretation: EPU is associated with financing-structure adjustment, but the exact channel may involve both debt usage and broader balance-sheet changes.

Table 5: Liability Scale and Equity Growth.

Variable	Ln(total liabilities)	Equity growth
LnEPU	0.0318 (1.29)	0.0595*** (3.60)
GDPGrowth	-0.0522*** (-7.71)	0.2067*** (3.21)
Size	1.2799*** (96.48)	0.0278*** (6.53)
ROA	-2.9562*** (-11.30)	1.2743*** (20.35)
Growth	0.2458*** (6.53)	0.0683*** (6.04)
Cash	-1.1600*** (-9.68)	-0.0307 (-0.84)
Tang	0.6901*** (2.96)	-0.0786** (-2.14)
Age	0.2989*** (5.90)	-0.0157 (-1.12)
Industry FE	Yes	Yes
Observations	2039	1455
Adjusted R-squared	0.814	0.349

Notes: *t*-statistics in parentheses. Standard errors are clustered at the industry-year level.

These additional tests help distinguish active debt expansion from mechanical leverage changes. If leverage rises only because equity shrinks, the interpretation would be different from a debt-substitution story. The evidence does not provide a strong and clean confirmation of active debt expansion because the total-liability coefficient is positive but insignificant. Therefore, the paper avoids overstating the mechanism. The results are more cautiously interpreted as showing that EPU is associated with a financing-structure shift, while the exact balance between debt expansion and equity-side adjustment requires further research with more detailed financing-flow data.

4.4. Firm Fixed Effects and Exploratory Heterogeneity

Table 6 reports firm fixed-effects regressions. After absorbing time-invariant firm characteristics, the coefficients of LnEPU remain positive for Lev and Short but become statistically insignificant. This result is important for interpretation. It implies that part of the baseline association may be related to persistent cross-sectional differences across firms. Therefore, the paper avoids strong causal language and treats the results as suggestive association evidence.

The weaker firm fixed-effects results are expected to some extent because the model uses only four annual EPU observations. Firm fixed effects remove all time-invariant firm characteristics and leave the identification to within-firm changes over a short horizon. Under such a demanding specification, statistical power is limited. The positive but insignificant coefficient therefore does not overturn the baseline evidence, but it does suggest that the baseline result should be read as suggestive association rather than definitive causal proof. This conservative interpretation is more appropriate for the data structure and for the purpose of an exploratory study on a relatively new market board.

Table 6: Firm Fixed-Effect Regressions.

Variable	Lev	Short	ER
LnEPU	0.0017 (0.30)	0.0019 (0.31)	-0.0012 (-0.05)
GDPGrowth	-0.0022 (-1.00)	-0.0032 (-1.52)	-0.0103 (-0.95)
Size	0.0889*** (4.28)	0.0245 (1.44)	0.2327** (2.53)
ROA	-0.2437*** (-3.64)	-0.1267* (-1.92)	-0.5799 (-1.55)
Growth	0.0346*** (7.47)	0.0362*** (7.04)	0.0770*** (3.61)
Cash	-0.0211 (-1.16)	-0.0366** (-2.20)	0.0289 (0.34)
Tang	0.1132*** (4.31)	0.0560** (2.17)	0.5972*** (4.02)
Age	0.2318*** (6.80)	0.1671*** (8.08)	0.8778*** (4.71)
Firm FE	Yes	Yes	Yes
Observations	2039	2039	2039
Adjusted R-squared	0.296	0.166	0.147

Notes: *t*-statistics in parentheses. Standard errors are clustered at the industry-year level. Firm fixed effects absorb time-invariant firm heterogeneity.

Table 7 reports exploratory interaction tests. The interaction terms with large-firm status and low-financing-constraint status are not statistically significant. This means that the paper does not claim strong group differences. The growth, financing-constraint, and cash interactions are also statistically insignificant. These tests are retained as exploratory evidence because they help evaluate possible channels without treating insignificant results as evidence against core hypotheses.

The absence of significant interaction effects also has substantive implications. It suggests that the average relationship between EPU and leverage is not sharply concentrated in one simple group, such as only large firms or only low-constraint firms. The financing response may depend on more complex combinations of industry competition, technology stage, bank relationships, equity-market windows, and policy support. Because the current dataset does not include detailed information on bank loans, R&D projects, or equity issuance intentions, the paper treats heterogeneity evidence as exploratory and leaves more precise mechanism tests to future research.

Table 7: Exploratory Interaction Tests.

Variable	Large firm	Low FC	Growth	FC	Cash
LnEPU	0.0114 (0.44)	0.0022 (0.10)	0.0120** (2.02)	0.0117* (1.95)	0.0124* (1.73)
Large	0.0005 (0.00)	-	-	-	-
LnEPU x Large	0.0034 (0.07)	-	-	-	-
Low FC	-	-0.1521 (-0.64)	-	-	-
LnEPU x Low FC	-	0.0239 (0.57)	-	-	-
LnEPU x Growth	-	-	-0.0747 (-1.62)	-	-
LnEPU x FC	-	-	-	0.0069 (0.99)	-
LnEPU x Cash	-	-	-	-	0.0301 (0.21)
Controls	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Observations	2039	2039	2039	2039	2039
Adjusted R-squared	0.407	0.407	0.407	0.406	0.406

Notes: Dependent variable is Lev. t-statistics in parentheses. Standard errors are clustered at the industry-year level. Interaction tests are exploratory rather than core hypothesis tests.

5. Discussion and Conclusions

This paper examines the relationship between economic policy uncertainty and the financing structure of STAR Market listed companies. The empirical results show that, after controlling for firm-level characteristics, industry effects, and GDP growth, EPU is positively associated with corporate leverage and the debt-to-equity ratio. The economic magnitude is not large, but it is meaningful in a market segment where firms face continuous innovation financing needs and where external financing conditions can change quickly. The result supports the possibility that, for innovation-oriented firms, the debt-substitution channel may dominate the precautionary deleveraging channel in certain periods.

The findings should nevertheless be interpreted with appropriate caution. The firm fixed-effects estimates are weaker, and the exploratory interaction tests do not show statistically significant group differences. These results indicate that the relationship between EPU and financing structure is not a simple causal mechanism that applies uniformly to all firms. Instead, the evidence suggests a positive association between policy uncertainty and debt dependence based on a short annual panel dataset. This interpretation is deliberately conservative and is consistent with the econometric limitations of using a macro variable that varies only across years.

A major implication of the results is that financing structure should be evaluated not only by leverage levels but also by debt maturity. The robustness tests show that EPU is not significantly associated with debt maturity structure or long-term debt ratio. This is consistent with the descriptive evidence that long-term debt accounts for a small proportion of assets among STAR Market firms. When uncertainty rises, many firms may have limited ability to replace short-term liabilities with long-term debt. Therefore, even if firms can obtain additional debt financing, the financing may not be sufficiently stable to match the long cycle of R&D and technology commercialization.

For enterprises, the results imply that STAR Market firms should improve financing planning under uncertain policy environments. Firms should avoid excessive reliance on short-term liabilities and should actively build multiple financing channels before uncertainty rises. In addition to traditional bank loans, firms may consider credit lines, supply-chain finance, intellectual-property pledge financing, convertible bonds, private placements, and cooperation with long-term institutional investors. Firms with high R&D intensity should pay particular attention to matching the maturity of financing instruments with the cash-flow cycle of innovation projects.

For financial institutions, the findings highlight the importance of improving credit evaluation methods for technology firms. Traditional collateral-based lending is often insufficient for firms whose value depends on patents, algorithms, technical teams, and future market opportunities. Banks and other financial institutions should develop credit-assessment models that incorporate R&D capability,

patent quality, customer concentration, order stability, and government innovation-support programs. Such improvements can reduce unnecessary credit rationing and help technology firms obtain more stable debt financing during periods of uncertainty.

For regulators and policymakers, the paper suggests that policy continuity and communication are important for stabilizing firms' financing expectations. Frequent changes in industrial, financial, or listing-related policies may increase uncertainty and affect financing behavior. Regulators can reduce unnecessary uncertainty by improving policy transparency, providing clear transition arrangements, and maintaining stable expectations regarding refinancing, market-making, and technology-credit support. At the same time, policy-based risk compensation mechanisms can encourage financial institutions to provide longer-term loans to small and high-R&D firms.

The study has several limitations. First, although GDP growth is included as a macro control, the sample contains only four years, and the model cannot fully separate EPU from all macroeconomic forces such as money supply, interest rates, market sentiment, and sector-specific policy cycles. Second, the paper uses annual data. Future research could combine quarterly financial statements with monthly EPU data to improve identification and examine more timely financing responses. Third, the paper does not directly observe financing costs, bank loan contracts, or equity issuance intentions. Future studies can use detailed financing-flow data to distinguish more clearly between active debt expansion, equity-financing contraction, and balance-sheet revaluation effects.

Future research may also compare the STAR Market with the ChiNext market and the main board. Such comparison would help determine whether the observed relationship is unique to innovation-oriented firms under the registration-based system or reflects a broader feature of Chinese listed companies. In addition, future work can explore the role of ownership type, R&D intensity, regional financial development, and government subsidies. These dimensions may explain why some firms can maintain financing stability under uncertainty while others face stronger financing constraints.

Overall, this paper provides evidence that macro policy uncertainty is associated with financing-structure adjustment among STAR Market firms. The results do not support a strong causal claim, but they reveal a meaningful pattern: under higher EPU, innovation-oriented listed firms tend to show greater debt dependence, while their ability to adjust toward longer-term debt remains limited. This finding enriches the understanding of how macro uncertainty interacts with technology-firm finance and provides practical implications for improving the stability of innovation financing in China's capital market.

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