

# Economic Policy Uncertainty, Corporate Financialization, and Corporate Innovation Investment: Evidence from Chinese A-Share Listed Firms

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**Abstract.** This study examines the relationship among economic policy uncertainty (EPU), corporate financialization, and corporate innovation investment using annual data for Shanghai and Shenzhen A-share listed firms from 2007 to 2022. Firm fixed-effects panel regressions are estimated with firm-level and macroeconomic controls, and the preferred specifications additionally absorb industry-year fixed effects. Short-run innovation investment is measured by the log change in R&D intensity, while a cumulative measure is used to characterize longer-run R&D dynamics. The results show that, after controlling for industry-year shocks, higher EPU is significantly associated with lower short- and long-run R&D investment. Corporate financialization has no statistically significant average effect in the full sample, but it significantly suppresses both short- and long-run R&D investment among large firms. The interaction between EPU and financialization is not significant across the main specifications. Heterogeneity tests further show that the negative association between EPU and R&D is pronounced among firms with weaker financing constraints and among firms operating in low-R&D-intensity industries. In low-concentration industries, EPU stimulates short-run R&D, whereas in high-concentration industries it suppresses both short- and long-run R&D. Replacing China-specific EPU with global EPU yields qualitatively consistent results. These findings highlight the importance of firm characteristics and competitive conditions in shaping innovation responses to policy uncertainty.

**Keywords:** R&D Investment, Economic Policy Uncertainty, Corporate Financialization, Corporate Innovation.

## 1. Introduction

Economic policy uncertainty has become an increasingly important feature of firms' operating environments. Changes in fiscal, monetary, regulatory, and industrial policies can alter expected returns, financing conditions, and the timing of irreversible investment. Baker, Bloom, and Davis<sup>[1]</sup> operationalize this concept using newspaper-based measures of economic policy uncertainty. For China, the resulting EPU index captures substantial variation in the policy environment and provides a useful macro-level indicator for studying corporate decisions.

At the same time, the growing allocation of corporate resources to financial assets has raised concerns about a shift from productive activity toward financial investment. Financial assets are often more liquid and may offer attractive short-run returns relative to fixed investment. In the Chinese setting, some listed firms, including firms with relatively low financing costs, have used external financing to expand their financial-asset holdings<sup>[2]</sup>. A larger financial-asset allocation can therefore compete with productive and innovative investment for internal resources.

Policy uncertainty and financialization are closely connected to corporate investment behavior. Changes in economic policy can affect systematic risk and firms' expectations about future conditions, thereby influencing investment decisions<sup>[3, 4]</sup>. Peng, Han, and Li<sup>[5]</sup> find that higher EPU tends to restrain corporate financialization in China, consistent with the idea that uncertainty reduces firms' willingness to undertake discretionary financial investment.

The effect of financialization on innovation is theoretically ambiguous. Financial assets may provide liquidity buffers and preserve or increase capital value, helping firms cope with future funding shortages and thereby supporting innovation<sup>[6, 7]</sup>. Conversely, excessive financial and real-

estate investment may crowd out resources needed for equipment upgrading and R&D [8]. Evidence from Chinese manufacturing firms also suggests that financialization motivated by short-term arbitrage can weaken long-run incentives for technological innovation [9].

The effect of EPU on innovation is similarly heterogeneous. Some studies argue that policy uncertainty can induce firms to pursue R&D as a means of adaptation and self-development, and report positive associations between EPU, R&D investment, and patenting [10, 11]. Other work emphasizes the wait-and-see response generated by investment irreversibility. Moreover, when EPU and financialization are considered jointly, an increase in financial-asset allocation may crowd out innovation investment, and policy uncertainty may intensify that crowding-out effect [12].

Existing evidence therefore does not imply a uniform relationship among EPU, financialization, and innovation. Firm size, industry R&D intensity, financing constraints, and industry concentration can materially alter corporate responses. This study examines these relationships using annual data for Chinese A-share listed firms from 2007 to 2022. It considers both short-run and cumulative R&D investment, estimates firm fixed-effects models with industry-year fixed effects, and conducts subsample analyses along the four dimensions above. The remainder of the paper develops the hypotheses, describes the data and empirical design, presents the results and robustness analysis, and concludes.

## 2. Theoretical Analysis and Research Hypotheses

### 2.1. Economic Policy Uncertainty, Financialization, and Innovation Investment

Financial investment can relax liquidity pressure and improve a firm's ability to finance innovation. Recent evidence nevertheless points to a significant inverted-U relationship between enterprise financialization and innovation: moderate financialization may be beneficial, whereas excessive financialization can divert resources away from R&D. This pattern is especially pronounced for large firms, firms with financial backgrounds, and firms with weaker innovation incentives [13]. Over a longer horizon, high levels of financialization are therefore expected to crowd out technological innovation.

Real-options theory provides a complementary channel for policy uncertainty. R&D expenditure can be viewed as an investment in intangible assets [14]. When uncertainty about the operating environment rises, the option value of waiting increases and firms may postpone irreversible investment until more information becomes available. Consistent with this mechanism, policy uncertainty has been shown to depress corporate investment by inducing precautionary delays [15]. Applied to innovation, higher EPU can therefore reduce firms' willingness to maintain or expand R&D expenditure.

**H1.** Economic policy uncertainty and corporate financialization are negatively associated with corporate innovation investment; increases in EPU and financialization are expected to suppress R&D investment.

### 2.2. Heterogeneity by Financing Constraints

Financing constraints can amplify the difficulty of sustaining innovation when uncertainty rises. Prior research on Chinese manufacturing firms documents a negative financing-constraint channel linking EPU to innovation investment and output [16]. From a real-options perspective, however, firms with relatively weak financing constraints may have greater discretion to postpone R&D when uncertainty raises the value of waiting. Hao, Wei, and Wen [17] argue that increasing EPU can therefore produce a stronger inhibitory effect on innovation among less financially constrained firms.

At the same time, firms with weaker financing constraints have more abundant resources and may use financial-asset allocation as a liquidity reserve for longer-run R&D. These competing mechanisms imply that financing conditions should be explicitly considered when evaluating the EPU-innovation relationship.

**H2.** Compared with firms facing stronger financing constraints, an increase in economic policy uncertainty has a stronger negative association with innovation investment among firms facing weaker financing constraints.

### 2.3. Heterogeneity by Industry Concentration

Industry concentration is inversely related to competitive intensity and can affect how firms respond to policy uncertainty. When competition is stronger, the inhibitory effect of EPU on corporate financial investment may be weakened <sup>[18]</sup>, leaving firms with stronger incentives to invest in innovation in order to protect or improve their competitive position.

The relationship between competition and innovation is also often nonlinear. Moderate competition can stimulate innovation, whereas very high concentration and weak competitive pressure may reduce innovation incentives <sup>[19, 20]</sup>. Accordingly, firms in low-concentration industries may react to policy uncertainty by increasing near-term R&D to maintain competitive advantage.

**H3.** When industry concentration is low and competition is strong, an increase in economic policy uncertainty is expected to stimulate corporate innovation investment.

## 3. Data, Variables, and Empirical Design

### 3.1. Data and Sample Construction

The sample consists of annual observations for firms listed on the Shanghai and Shenzhen A-share markets from 2007 to 2022. ST and PT firms, financial-sector firms, observations with abnormal financial data, and firms with extensive missing information are excluded. China-specific economic policy uncertainty is measured using the newspaper-based EPU index developed by Baker, Bloom, and Davis <sup>[1]</sup> and reported by the Economic Policy Uncertainty project. Following Gu, Chen, and Pan<sup>[11]</sup>, the 12 monthly observations in each year are averaged to obtain an annual EPU measure.

Firm-level financial data are obtained from the China Stock Market & Accounting Research (CSMAR) database, while macroeconomic data are obtained from the National Bureau of Statistics of China. To reduce the influence of extreme observations, the key continuous variables are winsorized at the 1st and 99th percentiles.

### 3.2. Variable Definitions

Innovation can be measured using either innovation inputs or innovation outputs. This study focuses on R&D input. The short-run dependent variable,  $G\_RD$ , is the year-to-year log change in the ratio of R&D expenditure to operating revenue multiplied by 100. The longer-run measure,  $cum\_G\_RD$ , is the within-firm cumulative sum of  $G\_RD$ .

The core explanatory variables are economic policy uncertainty and the trend in corporate financialization. Annual EPU is the standardized annual average of the monthly China EPU index. Financialization (Fin) is the standardized log growth rate of total financial assets. Financial assets include trading financial assets, derivative financial assets, available-for-sale financial assets, held-to-maturity investments, investment property, and long-term equity investments in financial institutions. For robustness, the China-specific EPU measure is replaced by standardized global EPU (EPU2).

Financing constraints are proxied by the Kaplan-Zingales (KZ) index <sup>[21]</sup>, where a higher value indicates stronger financing constraints. Industry competition is measured using the Herfindahl-Hirschman Index (HHI), calculated from firms' operating-revenue shares within each industry; a lower HHI indicates stronger competition. Following related work <sup>[5]</sup>, the regressions also include firm-level controls (Size, ROA, ROE, Age, and Tobin's Q) and macroeconomic controls (real GDP growth, M2 growth, and the log of outstanding financial-institution loans). Table 1 summarizes the variables.

**Table 1.** Variable Definitions

| Variable | Description                             | Measurement                                                        |
|----------|-----------------------------------------|--------------------------------------------------------------------|
| G_RD     | Short-run change in R&D intensity       | $100 \times [\ln(R\&D/revenue)_t - \ln(R\&D/revenue)_{t-1}]$       |
| cum_G_RD | Cumulative change in R&D intensity      | Within-firm cumulative sum of G_RD                                 |
| EPU      | Annual China EPU                        | Annual mean of 12 monthly China EPU observations; standardized     |
| EPU2     | Annual global EPU                       | Annual mean of 12 monthly global EPU observations; standardized    |
| Fin      | Growth in total financial assets        | Log change in total financial assets; standardized                 |
| HHI      | Herfindahl-Hirschman Index              | Sum of squared industry market shares based on operating revenue   |
| KZ       | Financing-constraint index              | Kaplan-Zingales index; higher values indicate stronger constraints |
| Tobin    | Tobin's Q                               | Market value relative to total assets                              |
| ROA      | Return on assets (%)                    | Net income / total assets                                          |
| ROE      | Return on equity (%)                    | Net income / average shareholders' equity                          |
| Size     | Firm size                               | Natural logarithm of total assets                                  |
| Age      | Listing age                             | Natural logarithm of years since listing                           |
| G_gdp    | Real GDP growth (%)                     | Growth rate of constant-price GDP                                  |
| G_m2     | M2 growth (%)                           | Growth rate of broad money supply (M2)                             |
| Loan     | Outstanding financial-institution loans | Natural logarithm of outstanding loan balance                      |

### 3.3. Empirical Model

To test Hypothesis H1, this paper constructs firm fixed-effects panel regression models. The dependent variables are short-term and long-term technological innovation inputs, while economic policy uncertainty and corporate financialization serve as core explanatory variables. An interaction term ( $EPU_t \times Fin_{it}$ ) is further introduced to examine how the relationship between corporate financialization and innovation is conditional on economic policy uncertainty. Subsample regressions are conducted based on financing constraints and industry competition intensity to verify Hypotheses H2 and H3.

$$G\_RD_{it} = \alpha_0 + \alpha_1 EPU_t + \alpha_2 Fin_{it} + \sum_{k=1}^n \alpha_{2+k} X_{kit} + Industry\_Year_{it} + u_i + \epsilon_{it} \quad (1)$$

$$G\_RD_{it} = \alpha_0 + \alpha_1 EPU_t + \alpha_2 Fin_{it} + \alpha_3 EPU_t \times Fin_{it} + \sum_{k=1}^n \alpha_{3+k} X_{kit} + Industry\_Year_{it} + u_i + \epsilon_{it} \quad (2)$$

$$cum\_G\_RD_{it} = \alpha_0 + \alpha_1 EPU_t + \alpha_2 Fin_{it} + \sum_{k=1}^n \alpha_{2+k} X_{kit} + Industry\_Year_{it} + u_i + \epsilon_{it} \quad (3)$$

$$cum\_G\_RD_{it} = \alpha_0 + \alpha_1 EPU_t + \alpha_2 Fin_{it} + \alpha_3 EPU_t \times Fin_{it} + \sum_{k=1}^n \alpha_{3+k} X_{kit} + Industry\_Year_{it} + u_i + \epsilon_{it} \quad (4)$$

In the above equations,  $G\_RD_{it}$  denotes the year-to-year log change in R&D intensity, capturing the short-run change in corporate innovation investment, while  $cum\_G\_RD_{it}$  denotes the cumulative change in R&D intensity and is used to capture longer-horizon R&D dynamics.  $EPU_t$  represents the economic policy uncertainty index, and  $Fin_{it}$  measures corporate financialization, proxied by the log growth rate of financial assets.  $EPU_t \times Fin_{it}$  is the interaction term between economic policy uncertainty and corporate financialization.  $X_{kit}$  denotes the set of firm-level and macroeconomic control variables, and  $Industry\_Year_{it}$  represents industry-by-year fixed effects.  $\mu_i$  captures time-invariant firm-specific unobserved heterogeneity, and  $\epsilon_{it}$  is the idiosyncratic error term. Subscripts  $i$  and  $t$  index firms and years, respectively. Standardized values of  $EPU_t$  and  $Fin_{it}$  are used in the reported regressions to improve the comparability of coefficient magnitudes and facilitate the interpretation of the interaction term.

To examine heterogeneous effects, the sample is further divided along four dimensions: firm size, industry R&D intensity, financing constraints, and industry concentration. Firm size is classified into small- and large-firm groups using a two-quantile split of the firm-size measure. For industry R&D intensity, the average R&D change is first calculated for each industry, and industries are then divided into low- and high-intensity groups using a two-quantile split of the corresponding industry-level measure. Specifically, the industry-level averages of *G\_RD* and *cum\_G\_RD* are used for the short-run and cumulative R&D analyses, respectively. Financing-constraint groups are constructed within each year by dividing firms into two quantiles according to the KZ index, with higher KZ values indicating stronger financing constraints. Industry concentration is divided into low- and high-concentration groups using a two-quantile split of the Herfindahl – Hirschman Index (HHI), where a lower HHI indicates stronger product-market competition.

## 4. Empirical Results

### 4.1. Baseline Regressions

Table 2 reports the baseline relationship of EPU and financialization with short- and long-run R&D investment. Columns (1) and (3), which do not absorb industry-year fixed effects, show small positive coefficients on EPU. Once industry-year fixed effects are included in columns (2) and (4), the EPU coefficients become -44.735 for *G\_RD* and -18.543 for *cum\_G\_RD* and are significant at the 1% and 10% levels, respectively. The sign reversal indicates that common shocks specific to industries and years are important confounding factors. In the preferred fixed-effects specifications, higher EPU is associated with lower R&D investment.

**Table 2.** Baseline Effects of EPU and Financialization on R&D Investment

| Dependent variable  | <i>G_RD</i><br>(1)  | <i>G_RD</i><br>(2)     | <i>cum_G_RD</i><br>(3) | <i>cum_G_RD</i><br>(4) |
|---------------------|---------------------|------------------------|------------------------|------------------------|
| EPU                 | 2.075***<br>(0.595) | -44.735***<br>(13.809) | 1.711***<br>(0.647)    | -18.543*<br>(9.488)    |
| Fin                 | -0.122<br>(0.302)   | -0.195<br>(0.305)      | 0.274<br>(0.274)       | 0.237<br>(0.271)       |
| Firm-level controls | YES                 | YES                    | YES                    | YES                    |
| Macro controls      | YES                 | YES                    | YES                    | YES                    |
| Industry-year FE    | NO                  | YES                    | NO                     | YES                    |
| Observations        | 19,267              | 19,267                 | 21,474                 | 21,474                 |
| R <sup>2</sup>      | 0.009               | 0.036                  | 0.088                  | 0.131                  |
| Number of firms     | 3,581               | 3,581                  | 3,735                  | 3,735                  |

Note: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in parentheses. Firm-level and macro-level control coefficients and the constant are omitted for brevity.

Because EPU can influence both innovation and financialization, and because the effect of financialization may depend on the policy environment, Table 3 adds the interaction EPU x Fin. The interaction is statistically insignificant in all four specifications, while the signs and significance of the main EPU coefficients remain close to those in Table 2. Thus, the full-sample evidence provides partial support for H1: EPU significantly suppresses innovation in the preferred specifications, but the average effect of financialization on R&D is not statistically distinguishable from zero.

**Table 3.** Baseline Results with the EPU x Fin Interaction

| Dependent variable  | G_RD<br>(1)         | G_RD<br>(2)            | cum_G_RD<br>(3)     | cum_G_RD<br>(4)     |
|---------------------|---------------------|------------------------|---------------------|---------------------|
| EPU                 | 2.067***<br>(0.596) | -44.618***<br>(13.812) | 1.713***<br>(0.647) | -18.572*<br>(9.473) |
| Fin                 | -0.194<br>(0.309)   | -0.268<br>(0.311)      | 0.309<br>(0.286)    | 0.262<br>(0.284)    |
| EPU x Fin           | 0.285<br>(0.272)    | 0.283<br>(0.278)       | -0.192<br>(0.260)   | -0.131<br>(0.255)   |
| Firm-level controls | YES                 | YES                    | YES                 | YES                 |
| Macro controls      | YES                 | YES                    | YES                 | YES                 |
| Industry-year FE    | NO                  | YES                    | NO                  | YES                 |
| Observations        | 19,267              | 19,267                 | 21,474              | 21,474              |
| R <sup>2</sup>      | 0.009               | 0.036                  | 0.088               | 0.131               |
| Number of firms     | 3,581               | 3,581                  | 3,735               | 3,735               |

Note: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in parentheses. Firm-level and macro-level control coefficients and the constant are omitted for brevity.

## 4.2. Heterogeneity by Firm Size and Industry R&D Intensity

### 4.2.1. Firm-Size Heterogeneity

Table 4 divides the sample by firm size. The EPU coefficients remain negative after industry-year fixed effects are controlled for, but the response differs across size groups. Small firms show a particularly strong negative long-run association between EPU and cumulative R&D (-45.975, significant at the 10% level), consistent with their more limited resources and greater sensitivity to an uncertain policy environment. Large firms have stronger liquidity and generally weaker financing constraints, which can make longer-run R&D plans less sensitive to policy fluctuations.

Financialization is not significant for small firms, but it significantly suppresses both short- and long-run R&D among large firms, with coefficients of -0.916 and -0.860. One interpretation consistent with prior evidence [5] is that large firms have greater capacity to allocate funds to financial assets and may be more responsive to short-run financial returns, which can divert resources from innovation. For the large-firm subsample, the negative financialization component of H1 is therefore supported.

**Table 4.** Heterogeneity by Firm Size

| Dependent variable  | Small firms         |                      | Large firms            |                     |
|---------------------|---------------------|----------------------|------------------------|---------------------|
|                     | G_RD<br>(1)         | cum_G_RD<br>(2)      | G_RD<br>(3)            | cum_G_RD<br>(4)     |
| EPU                 | -15.464<br>(23.004) | -45.975*<br>(27.293) | -57.162***<br>(17.132) | -11.907*<br>(6.256) |
| Fin                 | 0.159<br>(0.413)    | 0.503<br>(0.337)     | -0.916*<br>(0.492)     | -0.860**<br>(0.438) |
| EPU x Fin           | 0.478<br>(0.372)    | 0.003<br>(0.295)     | 0.125<br>(0.489)       | -0.180<br>(0.452)   |
| Firm-level controls | YES                 | YES                  | YES                    | YES                 |
| Macro controls      | YES                 | YES                  | YES                    | YES                 |
| Industry-year FE    | YES                 | YES                  | YES                    | YES                 |
| Observations        | 8,647               | 9,715                | 10,620                 | 11,759              |
| R <sup>2</sup>      | 0.072               | 0.141                | 0.044                  | 0.174               |
| Number of firms     | 2,317               | 2,501                | 2,156                  | 2,223               |

Note: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in parentheses. Firm-level and macro-level control coefficients and the constant are omitted for brevity.

#### 4.2.2. Industry R&D-intensity Heterogeneity

In the low-R&D-intensity group, EPU has significant negative associations with both short-run and cumulative R&D, with coefficients of -45.938 and -16.218, respectively. The larger short-run coefficient suggests that firms operating in industries with relatively low R&D intensity depend more heavily on a stable policy environment when planning near-term innovation. Such firms may have more limited technological reserves and financial capacity and therefore cut short-run R&D more aggressively when uncertainty rises.

**Table 5.** Heterogeneity by Industry R&D Intensity

| Dependent variable  | Low industry R&D intensity |                     | High industry R&D intensity |                    |
|---------------------|----------------------------|---------------------|-----------------------------|--------------------|
|                     | G_RD                       | cum_G_RD            | G_RD                        | cum_G_RD           |
|                     | (1)                        | (2)                 | (3)                         | (4)                |
| EPU                 | -45.938***<br>(13.814)     | -16.218*<br>(9.087) | -1.907<br>(7.691)           | -7.800<br>(12.099) |
| Fin                 | -0.194<br>(0.329)          | 0.291<br>(0.299)    | -1.909**<br>(0.829)         | -0.421<br>(0.910)  |
| EPU x Fin           | 0.274<br>(0.296)           | -0.171<br>(0.270)   | 0.111<br>(0.701)            | 0.705<br>(0.746)   |
| Firm-level controls | YES                        | YES                 | YES                         | YES                |
| Macro controls      | YES                        | YES                 | YES                         | YES                |
| Industry-year FE    | YES                        | YES                 | YES                         | YES                |
| Observations        | 17,306                     | 19,367              | 1,961                       | 2,107              |
| R <sup>2</sup>      | 0.036                      | 0.130               | 0.053                       | 0.073              |
| Number of firms     | 3,249                      | 3,398               | 424                         | 437                |

*Note:* \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in parentheses. Firm-level and macro-level control coefficients and the constant are omitted for brevity.

By contrast, the EPU coefficients are statistically insignificant for firms operating in high-R&D-intensity industries, indicating greater resilience of R&D plans to policy fluctuations. Financialization significantly reduces short-run R&D only in the high-intensity group (-1.909) and has no significant long-run effect. This pattern is consistent with greater rigidity in longer-term innovation strategies. The EPU x Fin interaction remains insignificant in all four specifications.

#### 4.3. Financing Constraints and Innovation Investment

Table 6 tests H2 by splitting firms according to the KZ financing-constraint index. For less financially constrained firms, the EPU coefficient is -55.154 for short-run R&D (significant at 5%) and -31.115 for cumulative R&D (significant at 10%). For more constrained firms, EPU strongly suppresses short-run R&D (-43.330, significant at 1%), while the long-run coefficient is negative but not significant. The results suggest that firms with severe constraints may prioritize basic operating needs when uncertainty rises, while firms with more financial discretion can postpone a broader range of R&D projects.

Financialization does not significantly affect short-run R&D among less constrained firms, but it is positively associated with cumulative R&D (0.602, significant at 10%), which is consistent with a possible liquidity-buffer role over longer horizons. The interaction term is insignificant in both financing-constraint groups. Overall, the evidence is broadly consistent with H2, particularly for cumulative R&D: EPU exerts a more persistent negative association among firms with weaker financing constraints.

**Table 6.** Heterogeneity by Financing Constraints

| Dependent variable  | Low constraints       |                      | High constraints       |                     |
|---------------------|-----------------------|----------------------|------------------------|---------------------|
|                     | G_RD                  | cum_G_RD             | G_RD                   | cum_G_RD            |
|                     | (1)                   | (2)                  | (3)                    | (4)                 |
| EPU                 | -55.154**<br>(26.069) | -31.115*<br>(18.434) | -43.330***<br>(16.448) | -19.773<br>(15.808) |
| Fin                 | -0.303<br>(0.378)     | 0.602*<br>(0.359)    | -0.298<br>(0.619)      | -0.329<br>(0.548)   |
| EPU x Fin           | 0.375<br>(0.334)      | 0.069<br>(0.315)     | -0.246<br>(0.560)      | -0.471<br>(0.523)   |
| Firm-level controls | YES                   | YES                  | YES                    | YES                 |
| Macro controls      | YES                   | YES                  | YES                    | YES                 |
| Industry-year FE    | YES                   | YES                  | YES                    | YES                 |
| Observations        | 9,548                 | 10,154               | 9,303                  | 10,525              |
| R <sup>2</sup>      | 0.067                 | 0.150                | 0.052                  | 0.154               |
| Number of firms     | 2,726                 | 2,786                | 2,450                  | 2,550               |

Note: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in parentheses. Firm-level and macro-level control coefficients and the constant are omitted for brevity.

#### 4.4. Industry Competition and Innovation Investment

Table 7 reports results by industry concentration. In low-concentration industries, EPU has a significant positive association with short-run R&D (85.270, significant at 5%) and a positive but insignificant long-run coefficient. In high-concentration industries, the relationship reverses: EPU significantly suppresses both short-run and cumulative R&D. These results suggest that policy changes may alter competitive conditions and demand in ways that induce firms in competitive industries to increase near-term R&D to protect market position, whereas firms in concentrated industries can respond more defensively by reducing innovation expenditure.

Financialization significantly suppresses short-run R&D in low-concentration industries (-0.709, significant at 10%) but has no significant long-run effect. The EPU x Fin interaction is insignificant in both concentration groups. H3 is therefore supported for short-run R&D in low-concentration, highly competitive industries, but not for cumulative R&D.

**Table 7.** Heterogeneity by Industry Concentration

| Dependent variable  | Low concentration    |                    | High concentration     |                     |
|---------------------|----------------------|--------------------|------------------------|---------------------|
|                     | G_RD                 | cum_G_RD           | G_RD                   | cum_G_RD            |
|                     | (1)                  | (2)                | (3)                    | (4)                 |
| EPU                 | 85.270**<br>(34.777) | 35.100<br>(22.087) | -45.210***<br>(14.160) | -16.803*<br>(9.274) |
| Fin                 | -0.709*<br>(0.418)   | -0.013<br>(0.390)  | 0.018<br>(0.531)       | 0.522<br>(0.461)    |
| EPU x Fin           | 0.051<br>(0.391)     | -0.372<br>(0.363)  | 0.614<br>(0.439)       | 0.199<br>(0.393)    |
| Firm-level controls | YES                  | YES                | YES                    | YES                 |
| Macro controls      | YES                  | YES                | YES                    | YES                 |
| Industry-year FE    | YES                  | YES                | YES                    | YES                 |
| Observations        | 9,472                | 10,600             | 9,662                  | 10,704              |
| R <sup>2</sup>      | 0.043                | 0.136              | 0.044                  | 0.128               |
| Number of firms     | 2,272                | 2,389              | 2,501                  | 2,626               |

Note: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in parentheses. Firm-level and macro-level control coefficients and the constant are omitted for brevity.

## 5. Robustness Check

Because policy developments in major economies can affect Chinese firms through trade, finance, expectations, and other channels, global economic policy uncertainty provides a useful alternative proxy for the external uncertainty environment. The baseline regressions are therefore re-estimated after replacing China-specific EPU with global EPU (EPU2). As shown in Table 8, the qualitative pattern is consistent with the baseline results: once industry-year fixed effects are included, EPU2 is negatively associated with both short-run and cumulative R&D, while financialization and the interaction term remain statistically insignificant in the full sample.

**Table 8.** Robustness Check Using Global Economic Policy Uncertainty

| Dependent variable  | G_RD<br>(1)        | G_RD<br>(2)           | cum_G_RD<br>(3)     | cum_G_RD<br>(4)     |
|---------------------|--------------------|-----------------------|---------------------|---------------------|
| EPU2                | 0.793**<br>(0.380) | -26.737***<br>(8.215) | 0.974***<br>(0.323) | -11.044*<br>(5.655) |
| Fin                 | 0.161<br>(0.572)   | 0.235<br>(0.564)      | 0.269<br>(0.494)    | 0.225<br>(0.492)    |
| EPU2 x Fin          | -0.227<br>(0.361)  | -0.342<br>(0.360)     | 0.000<br>(0.332)    | 0.010<br>(0.329)    |
| Firm-level controls | YES                | YES                   | YES                 | YES                 |
| Macro controls      | YES                | YES                   | YES                 | YES                 |
| Industry-year FE    | NO                 | YES                   | NO                  | YES                 |
| Observations        | 19,267             | 19,267                | 21,474              | 21,474              |
| R <sup>2</sup>      | 0.009              | 0.036                 | 0.088               | 0.131               |
| Number of firms     | 3,581              | 3,581                 | 3,735               | 3,735               |

Note: \*\*\*, \*\*, and \* denote statistical significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in parentheses. Firm-level and macro-level control coefficients and the constant are omitted for brevity.

## 6. Conclusion

Using data for Chinese Shanghai and Shenzhen A-share listed firms from 2007 to 2022, this study examines the relationship among economic policy uncertainty, corporate financialization, and innovation investment while accounting for several dimensions of heterogeneity. The preferred specifications indicate that EPU suppresses both short- and long-run R&D after industry-year fixed effects are absorbed. Financialization has no significant average effect in the full sample, but it significantly reduces innovation investment among large firms. The EPU x Fin interaction is consistently insignificant.

The heterogeneity results show that the EPU-innovation relationship varies materially with financing conditions and product-market structure. Less financially constrained firms exhibit a pronounced negative response to EPU, especially for cumulative R&D, while low-concentration industries display a positive short-run response to EPU. In high-concentration industries, by contrast, EPU suppresses both short- and long-run R&D. The global-EPU robustness test produces a similar overall pattern. These results imply that neither policy uncertainty nor financialization should be evaluated independently of firm characteristics and competitive conditions.

The study also has limitations. The interaction between EPU and financialization is insignificant across the reported specifications, which may reflect offsetting mechanisms, heterogeneous corporate adaptation strategies, or limitations of the available variables and empirical design. Future work could extend the sample, refine the measures of financialization and innovation, and examine additional channels through which policy uncertainty shapes firms' dynamic resource allocation.

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