Academic Education Publishing House

Economic Society and Humanities Vol. 3 No. 3, 2026

Research on the Impact of Economic Policy Uncertainty Perception on Enterprise Digital Transformation

Wenhao Pan

School of Economics and Management, Jiangxi Normal University, Nanchang, Jiangxi, China

Abstract: Amid the dual interplay of advancing the digital China strategy and a complex, volatile macroeconomic environment, how enterprises' perception of economic policy uncertainty reshapes their digital transformation decisions has become a critical issue requiring clarification. Based on annual report data of China A-share listed companies from 2010 to 2023, this paper empirically examines the impact of policy uncertainty perception on digital transformation. The study finds that perceived economic policy uncertainty significantly inhibits corporate digital transformation-a conclusion that remains robust after rigorous testing. Mechanism analysis reveals that intensified financing constraints, induced managerial short-sightedness, and diminished risk-taking capacity serve as the three primary channels hindering transformation. Heterogeneity analysis demonstrates that this inhibitory effect is more pronounced among firms with lower managerial shareholding ratios, lower inherent risks, and non-manufacturing enterprises. This study expands research on the drivers of digital transformation from a micro-cognitive perspective, providing empirical insights for governments to stabilize policy expectations and for enterprises to optimize their transformation decisions.

Keywords: Economic Policy Uncertainty Perception; Digital Transformation; Financing Constraints; Management Short-Sightedness; Risk-Taking

1. Introduction

Accelerating the development of Digital China has been established as a crucial strategic pillar for advancing Chinese-style modernization. In the process of its deep integration with the real economy, digital transformation has evolved from an optional upgrade path for enterprises into an imperative route for enhancing core competitiveness and meeting the demands of high-quality development. However, in recent years, the global development landscape has undergone profound adjustments, geopolitical conflicts have intensified, and coupled with the continuous optimization of industrial policies as the domestic economy transitions to a high-quality development phase, economic policy uncertainty has risen significantly-a trend clearly captured by the Global Economic Policy Uncertainty Index (EPU Index) developed by Baker et al. [1] and corroborated by Nie et al. [2] through their research on the China context. Against this backdrop, as micro-level agents of market decision-making, how enterprises' subjective perception of policy environment stability influences their strategic choices and implementation of digital transformation has become a central focus for both academic research on policy-enterprise behavior transmission mechanisms and practical efforts to optimize transformation decisions.

From the perspective of existing research, academic discussions on policy uncertainty have predominantly focused on macro-level analyses. Using the EPU index as a core analytical tool, scholars have demonstrated its significant impact on corporate investment scale fluctuations [3], innovation input intensity [4], and export decision adjustments. However, macro-level indices inherently rely on aggregated data from media reports and policy documents, which inherently suffer from averaging bias-unable to differentiate sensitivity variations across industries and enterprise sizes to policy changes, nor to capture risk perception heterogeneity among firms within the same industry due to differences in resource endowments and governance structures [2]. Recent studies have shifted focus to enterprise-level policy uncertainty perception, revealing that such micro-level perceptions substantially influence corporate R&D investment intensity [5], capital structure adjustment velocity [6], and

strategic aggressiveness [7] through channels like managerial risk appetite and resource allocation efficiency. Notably, existing micro-level research still exhibits critical gaps: Digital transformation is not merely tactical investment but a systemic strategic transformation involving business process reengineering, organizational restructuring, data element integration, and technological capability iteration. It not only features high sunk costs and extended recovery cycles but also faces unique challenges including technological roadmap iteration risks, data compliance risks, and organizational adaptation risks [8]. This distinctiveness implies that enterprises' subjective perception of the policy environment may influence the transformation process through more complex channels such as financing constraints, yet existing research has not yet conducted systematic exploration in this specific domain.

Building on this foundation, this study utilizes annual report textual data from A-share listed companies to construct an enterprise-level economic policy uncertainty perception index, empirically examining its impact mechanisms and heterogeneous effects on digital transformation. The research not only enriches existing studies on the relationship between policy uncertainty and corporate strategic decision-making, but also provides practical insights for enterprises to advance digital transformation in complex policy environments.

2. Theoretical Analysis and Research Hypotheses

Corporate digital transformation is essentially a quintessential Real Options investment behavior, involving long-term investments in infrastructure such as artificial intelligence, big data analytics, and blockchain technology, characterized by significant irreversibility, high sunk costs, and delayed returns [3]. Unlike traditional capital investments, digital transformation requires enterprises to restructure their organizational frameworks, reform business processes, and cultivate new capabilities-investments that, once made, are difficult to reverse, with their value realization heavily dependent on the dynamic alignment of policy environments, technological pathways, and market demands [8]. According to Real Options theory, when experiencing severe economic policy fluctuations, companies tend to prioritize maintaining stability in their core operations to mitigate risks rather than hastily restructuring production factors, significantly reducing their willingness for digital transformation. Meanwhile, data-as a new production factor-can only realize its value through platform-based information transmission or algorithmic mining; however, current institutional frameworks are inadequate, and platform sharing risks information leaks and data security vulnerabilities. Additionally, data must be processed by algorithms to fully unlock its value, yet algorithms lack emotional awareness, leading companies to severely question the authenticity of their output data during policy turbulence. Out of risk aversion, managers become more reluctant to authorize algorithmic operations, thereby hindering corporate digital transformation [9]. Based on this, this paper proposes the following hypotheses:

H1: Perceived uncertainty in economic policies significantly negatively impacts the extent of corporate digital transformation.

As a transformative initiative for enterprises, digital transformation requires substantial, long-term, and sustained financial investments. When companies perceive high levels of uncertainty, external funding providers such as banks and investors become more cautious, significantly increasing financing difficulties and costs. On one hand, corporate access to credit financing becomes substantially more challenging. Traditional financial institutions like banks inherently exhibit risk aversion; during periods of macroeconomic instability or industry uncertainty, banks tend to tighten lending standards [10]. Concurrently, uncertainty often correlates with asset price volatility, destabilizing the value of corporate collateral and reducing banks' willingness to extend loans. Moreover, digital transformation projects inherently feature high intangible asset ratios and unpredictable future cash flows. In high-risk environments, banks struggle to assess project risks and returns, leading to loan rejections or demands for exorbitant risk premiums. On the other hand, corporate equity financing faces heightened challenges and costs. Investors from venture capital, private equity, and public markets demand higher expected returns to compensate for risks, forcing companies to raise capital at lower valuations and dilute equity structures to secure funding, resulting in significantly elevated financing costs.

Simultaneously, investment focus shifts as investors may redirect capital from high-risk, long-term transformation projects toward short-term, more defensive sectors. Digital transformation initiatives are frequently labeled as high-risk and consequently shelved. Based on these observations, this paper proposes the following hypotheses:

H2: Heightened perception of economic policy uncertainty exacerbates corporate financing difficulties, consequently reducing the level of digital transformation among enterprises.

Digital transformation represents a quintessential cross-period strategy characterized by explicit current costs and delayed future benefits. Companies often endure prolonged organizational adaptation phases and performance adjustment periods. Within behavioral finance and principal-agent frameworks, when external policy environments become ambiguous and volatile, market information noise intensifies while future cash flow predictability plummets. During such scenarios, management faces escalating performance evaluation pressures and career displacement risks, leading to a significant increase in time discount rates for strategic decisions. To smooth current profits and project operational stability externally, managers frequently fall into short-sighted traps. They tend to sacrifice long-term development potential by not only proactively cutting or indefinitely postponing IT budgets for digital infrastructure, but also diverting limited funds to quick-fix operations that superficially enhance financial statements. This profit-driven decision-making bias fundamentally undermines the long-term discipline essential for digital transformation. Based on these insights, we propose:

H3: Perceived uncertainty in economic policies may exacerbate managerial short-sightedness, thereby hindering corporate digital transformation.

Digital transformation is far more than mere procurement of IT software and hardware-it represents a creative disruption that touches upon an enterprise's core business logic, dismantles cross-departmental data silos, and challenges entrenched interest structures. This process inherently entails substantial trial-and-error costs in technological approaches and risks of business model restructuring, making it highly dependent on organizations' strong risk-taking willingness and a culture that embraces failure. However, based on prospect theory and the threat-inertia effect, escalating economic policy uncertainties are interpreted by management as a profound deterioration of the operating environment. Driven by intense loss aversion, corporate strategic focus rapidly shifts from proactive value creation to defensive survival measures. Internal organizational mechanisms quickly activate rigid responses: decision-making power becomes highly centralized at senior levels, approval standards for resource allocation become strictly tightened, and innovation and experimentation space at the grassroots level is significantly compressed. Confronted with the high-failure-rate digital wave, enterprises would rather retreat to traditional, cash-flow-stable businesses-accepting the implicit opportunity cost of missing digital dividends-than confront the explicit survival crisis arising from failed transformations compounded by policy instability. Accordingly, the following conclusion is drawn:

H4: Perceived uncertainty in economic policies reduces enterprises' risk-taking capacity, thereby hindering their digital transformation.

3. Research Design

3.1 Sample Selection and Data Sources

This study initially selected A-share listed companies from 2010 to 2023 as the sample, excluding financial sector firms and ST/PT companies, ultimately yielding 25,612 observations. Data were sourced from the Cathay Pacific Database (CSMAR), with continuous variables subjected to tail-trimming at the 1% level to mitigate the impact of outliers.

3.2 Variable Definitions

Core explanatory variable FEPU: Drawing on Nie et al. [2], we developed an economic policy uncertainty perception index at the corporate level. Using the "Management Discussion and Analysis (MD&A)" section from listed companies' annual reports as the analytical text, we manually constructed two lexicons: "economic policies" and "uncertainty." Python was employed to perform sentence segmentation and word frequency analysis on MD&A content, with sentences containing words from both lexicons defined as "policy uncertainty perception sentences." The final indicator was

calculated as the ratio of uncertainty-related word count in policy uncertainty perception sentences to the total word frequency in MD&A sections. Higher values indicate greater perceived economic policy uncertainty among enterprises.

The dependent variable DT: Drawing on the research methodology of Wu et al. [8], the digital transformation indicators were constructed using text analysis. First, a specialized dictionary of digital transformation terms was compiled, encompassing five categories: artificial intelligence, blockchain, cloud computing, big data, and digital technology applications. Second, Python web scraping technology was employed to count the frequency of relevant terms in annual reports of listed companies, while excluding invalid texts unrelated to the companies and keywords containing negative prefixes. Finally, the effective word frequency was increased by 1 and then subjected to natural logarithmic transformation to derive the digital transformation index; a higher index value indicates a more advanced level of corporate digital transformation.

Control Variables: Drawing on existing literature on corporate digital transformation [8,11], and considering that a company's resource endowment, financial condition, and governance structure significantly influence digital strategy decisions, this study selects the following control variables to mitigate endogeneity issues arising from omitted variables: firm size (Size); years since listing (Age); ownership type (SOE); debt-to-asset ratio (Lev); return on total assets (ROA); cash flow ratio (Cash); growth rate (Growth); equity concentration (Top1); independence (Indep); and dual executive roles (Dual).

3.3 Model Construction

To verify the aforementioned findings, this section employs a two-way fixed OLS model to examine the impact of corporate risk perception on digital transformation. The regression model is designed as follows:

$$DT_{i,t}=\alpha_0+\alpha_1 FEPU_{i,t}+\sum_k \gamma_k Controls_{k,i,t}+\mu_i+\delta_t+\epsilon_{i,t} \quad (1)$$

Here, i denotes the firm, and t denotes $DT_{i,t}FEPU_{i,t}Controls_{k,i,t}\mu_i\delta_t\epsilon_{i,t}$ the year. The dependent variable is the degree of corporate digital transformation. The core explanatory variable is the firm's perceived uncertainty regarding economic policies. The set of control variables includes: FirmFE, representing firm-specific fixed effects to account for time-invariant firm characteristics (e.g., corporate culture, geographic location); YearFE, capturing time-varying but firm-independent macroeconomic shocks (e.g., the 2008 financial crisis, the 2020 COVID-19 pandemic); and the random disturbance term.

To test the mechanism effect of this study, the following testing model is established:

$$Mechanism_{i,t}=\beta_0+\beta_1 FEPU_{i,t}+\sum \gamma Controls+\mu_i+\delta_t+\epsilon_{i,t} \quad (2)$$

The three $Mechanism_{i,t}$ mechanism variables central to this study are sequentially substituted as follows: financing constraints (SA) representing the capital dimension, managerial short-sightedness (Manage) representing the willingness dimension, and risk-taking capacity (ADJ_Roa) representing the capability dimension. If the regression coefficient β1 demonstrates statistical significance with directions consistent with the theoretical derivations of Hypotheses H2, H3, and H4, it confirms the validity of the hypothesis that perceived economic policy uncertainty inhibits digital transformation through these three pathways.

4. Empirical Analysis

4.1 Descriptive Statistics

Table 1 presents descriptive statistics for key variables. The standardized deviation of the dependent variable "Corporate Digital Transformation (DT)" is 1.435 with a minimum value of 0, indicating significant divergence in digitalization progress among A-share listed companies, where some enterprises have yet to initiate substantive transformation. The core explanatory variable "Perceived Economic Policy Uncertainty (FEPU)" shows a mean of 0.110 and a maximum value of 0.515, reflecting pronounced heterogeneity in micro-level perceptions of macroeconomic policy fluctuations across firms. Furthermore, all control variables demonstrate statistically sound distributions consistent with mainstream literature, confirming the representativeness of our sample selection.

Table 1. Descriptive Statistics

	count	mean	sd	min	p50	max
DT	25612	1.728	1.435	0.000	1.609	5.182
FEPU	25612	0.110	0.105	0.000	0.083	0.515

Size	25612	22.460	1.303	19.812	22.266	26.262
Age	25612	2.069	0.907	0.000	2.197	3.401
Lev	25612	0.411	0.196	0.052	0.404	0.895
ROA	25612	0.042	0.060	-0.224	0.041	0.206
Cash	25612	0.055	0.066	-0.134	0.053	0.248
Growth	25612	0.164	0.361	-0.496	0.106	2.114
Top1	25612	0.339	0.148	0.086	0.318	0.748
Indep	25612	37.750	5.340	33.330	36.360	57.140
Dual	25612	0.308	0.462	0.000	0.000	1.000

4.2 Benchmark Regression Analysis

This study employs Equation (1) as the primary regression model. Table 2 presents the regression results of FEPU (Economic Policy Uncertainty) measured through annual corporate reports and enterprise digitalization, calculated using the least squares method. Column (1) in Table 2 excludes control variables and fixed effect adjustments, while Column (2) incorporates control variables. Column (3) further controls for firm-level and year-specific fixed effects with clustered standard errors at the firm level. Across all three regression models, the coefficient of FEPU demonstrates statistically significant negative values at the 1% significance level, indicating that increased economic policy uncertainty correlates with reduced levels of digital transformation. These findings substantiate our research hypothesis H1.

Table 2. Benchmark Regression Results

	(1)	(2)	(3)	(4)
	DT	DT	DT	DT
FEPU	-1.946***	-1.861***	-0.316***	-0.229***
	(-13.646)	(-13.379)	(-4.637)	(-2.607)
Controls	No	Yes	Yes	Yes
_cons	1.941***	-1.217***	-2.530***	-2.536***
	(66.946)	(-2.928)	(-4.216)	(-4.227)
Firm_FE	No	No	Yes	Yes
Year_FE	No	No	Yes	Yes
N	25612.000	25612.000	25515.000	25515.000
r2_a	0.020	0.060	0.818	0.818

Note: ***, **, and * indicate statistical significance at the 1%,5%, and 10% confidence levels, respectively, with t-values provided in parentheses. The same applies to the table below.

4.3 Endogenous Discussion

(1) Control for high-order fixed effects

To address potential confounding variables that may evolve over time across industries or regions and could distort estimation results, this study extends the benchmark regression framework by incorporating higher-order fixed effects. Table 3 presents the corresponding regression results: Column (1) controls for "year-enterprise" interaction, Column (2) further introduces the "industry-year" (Ind_Year_FE) interaction term, and Column (3) incorporates the "province-year" (Pro_Year_FE) interaction term. The results demonstrate that under rigorous high-order fixed effect controls, the estimated coefficients of FEPU on DT are-0.316, -0.293, and-0.288, all showing statistically significant negative values at the 1% level. This indicates that core conclusions remain robust after accounting for time-varying confounding factors at both industry and provincial levels.

Table 3. Endogeneity Test – Control for Higher-Order Fixed Effects

	(1)	(2)	(3)
	DT	DT	DT
FEPU	-0.316***	-0.293***	-0.288***
	(-4.637)	(-4.383)	(-4.300)
Controls	Yes	Yes	Yes
_cons	-2.530***	-2.373***	-2.476***
	(-4.216)	(-4.142)	(-4.326)
Firm_FE	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes
Ind_Year_FE	No	Yes	Yes
Pro_Year_FE	No	No	Yes
N	25515.000	25469.000	25451.000
r2_a	0.818	0.827	0.827

(2) Instrumental Variable Method

FEPU average of other enterprises in the same industry (Ins_FEPU)

This study initially selects the average FEPU (Ins_FEPU) of other enterprises within the same industry and year (excluding the target firm) as the instrumental variable. In terms of correlation, firms in the same industry face homogeneous macroeconomic shocks and regulatory environments, resulting in significant peer effects in management's policy perception reflected in annual reports. Regarding exogeneity, subjective risk perceptions from external firms do not directly influence the target firm's internal resource allocation or digital strategy, satisfying the exclusivity constraint. Regression results in Table 4 demonstrate that the first-stage instrumental variable coefficient is significantly positive at the 1% level. The second-stage analysis shows an impact coefficient of-2.238 ($p<0.01$) for FEPU's fitted value on digital transformation (DT), confirming the null hypothesis remains valid after endogeneity adjustment.

Global/US EPU and the interaction term with one-period lagged digitalization (DT_EPU_Global/DT_EPU_US).

To identify more pure exogenous shocks, this paper draws on Bartik's (Shift-Share) construction approach, selecting the macro-level Global and US Economic Policy Uncertainty Indexes (EPU_Global/EPU_US) and the one-period lagged digital transformation level of micro firms (L.DT) to construct interaction terms as instrumental variables. On one hand, global macro policy fluctuations (such as trade frictions and technological blockades) can rapidly be transmitted domestically, and firms with deeper historical digitalization levels exhibit stronger dependence on global open-source communities for foundational technologies and high-end supply chains, inevitably making them more "sensitive" to external shocks. On the other hand, individual China micro firms are price takers in the international macro environment, and their one-period lagged digitalization level represents a historical state unaffected by unobserved current disturbances, meeting the requirements of instrumental variable relevance and exogeneity. Results from Tables 5 and 6 show that whether using global or US EPU instruments, the fitted values of FEPU remain significantly negative at the 1% level. Additionally, the Cragg-Donald Wald F-values for both groups in the first stage are substantially greater than the empirical critical value of 10, effectively eliminating weak instrumental variable issues and further solidifying the core causal inference of this study.

Table 4. Endogeneity Test – Instrument Variable Method – Ins_FEPU

	(1)	(2)
	FEPU	DT
FEPU_Ins_mean	0.417***	
	(10.516)	
FEPU		-2.238***
		(-2.952)
Controls	Yes	Yes
R2		-0.043
F	110.576	12.541
CDWaldF	284.378	
SWSstat.	9.415	

Table 5. Endogeneity Test-Instrumental Variable Method-DT_EPU_global

	(1)	(2)
	FEPU	DT
DT_EPU_global	-0.002***	
	(-3.550)	
FEPU		-205.074***
		(-3.548)
Controls	Yes	Yes
R2		-694.644
F	12.603	1.318
CDWaldF	26.107	
SWSstat.	1497.745	

Table 6 Endogeneity Test-Instrumental Variable Method-DT_EPU_US

	(1)	(2)
	FEPU	DT
DT_EPU_US	-0.002***	
	(-3.454)	
FEPU		-200.532***
		(-3.452)
Controls	Yes	Yes
R2		-664.163
F	11.930	1.255
CDWaldF	22.225	
SWSstat.	1495.401	

4.4 Robustness Test

To validate the reliability of core conclusions, this study conducted four robustness tests (regression results detailed in Table 7). First, we included lagged explanatory variables. Considering the time lag effect of macro policies in micro-level strategy implementation and potential reverse causality issues arising from digital transformation's impact on managerial perceptions, we incorporated the lagged core explanatory variable (L.FEPU) into the model. Second, we replaced core variables to mitigate measurement biases from single-text indicators. Specifically: 1) Referring to Zhao et al. [12], we reconstructed the Digital Transformation Index (Dig_ZCY) focusing on digital technology application scenarios; 2) To eliminate noise from lexical redundancy, we recalculated policy perception using sentence frequency ratio (effective sentences containing both "economic policy" and "uncertainty" divided by total sentences, FEPU_Sentence). Third, we excluded samples from special periods. As COVID-19 emerged as a sudden global exogenous shock that may have disrupted corporate digitalization efforts, we removed samples from 2020-2023 for reestimation to exclude confounding factors. Fourth, we excluded policy-sensitive regions. First-tier cities like Beijing, Shanghai, Guangzhou, and Shenzhen host numerous digital economy pilot projects and infrastructure, creating geographical selection bias in corporate sensitivity to policy changes. All robustness tests consistently demonstrated significantly negative correlation coefficients, confirming the robustness of baseline regression results.

Table 7. Robustness Test

	(1)	(2)	(3)	(4)	(5)
	lagged first-phase FEPU	Dig_ZCY	FEPU_Sen	Excluding special periods	Excluding sensitive areas
L.FEPU	-0.137**				
	(-2.009)				
FEPU_Sen			-0.020***		
			(-5.540)		
FEPU		-0.007***		-0.278***	-0.325***
		(-5.985)		(-3.591)	(-4.235)
Controls	Yes	Yes	Yes	Yes	Yes
_cons	-1.810**	-0.086***	-2.500***	-2.942***	-2.587***
	(-2.553)	(-6.250)	(-4.162)	(-4.773)	(-3.882)
Firm_FE	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes
N	20727.000	25515.000	25515.000	16290.000	20197.000
r2_a	0.831	0.846	0.818	0.802	0.806

5. Mechanism Testing

The preceding theoretical analysis indicates that perceived economic policy uncertainty primarily hinders digital transformation through three pathways: exacerbating financing constraints, inducing managerial short-sightedness, and reducing corporate risk-taking capacity. Based on Model (2), Table 8 presents the regression results of mechanism testing.

1. Financing Constraint Mechanism: Column (2) uses financing constraints (SA index) as the mechanism variable. The regression results show that the estimated coefficient of FEPU on SA is-0.020, significant at the 1% level. Since the SA index typically takes negative values, its absolute magnitude indicates greater financing constraints. This negative coefficient demonstrates that economic policy uncertainty significantly exacerbates corporate financing constraints. The tightening of capital chains directly results in insufficient capital for enterprises to fund digital projects with high sunk costs, thereby validating Hypothesis H2.

2. Management Short-Sightedness Mechanism: Column (3) uses management short-sightedness (Manage) as the mechanism variable, with an estimated coefficient of 0.009 in FEPU, which is significantly positive at the 1% level. This indicates that when firms perceive external policy volatility, management's short-sightedness tendency-driven by performance evaluation and career defense motives-significantly increases, leading to a higher time discount rate and consequent reduction in budget allocation for digitalization, an "intertemporal investment"; thus, Hypothesis H3 is validated.

3. Risk-Taking Capability Mechanism: Column (4) uses corporate risk-taking capability (ADJ_Roa) as the mechanism variable, with the FEPU coefficient showing a significant negative value of-0.005 at the 5% level. This indicates that rising uncertainty triggers an "threat rigidity" response in organizations, prompting them to proactively reduce risk exposure and undermining their strategic capacity to drive "creative destruction" -driven digital transformation. Hypothesis H4 is thus validated.

Table 8. Mediating Effect

	(1)	(2)	(3)	(4)
	DT	SA	Manage	ADJ_Roa
FEPU	-0.316***	-0.020***	0.009***	-0.005**
	(-4.637)	(-2.790)	(3.020)	(-2.235)
Controls	Yes	Yes	Yes	Yes
_cons	-2.530***	-4.235***	0.088***	-0.122***
	(-4.216)	(-39.603)	(4.760)	(-5.348)
Firm_FE	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes
N	25515.000	25515.000	25508.000	17716.000
r2_a	0.818	0.975	0.488	0.895

6. Heterogeneity Analysis

Enterprises with distinct characteristics exhibit significant heterogeneity in digital transformation decisions when facing macro policy shocks, driven by differences in internal governance, risk tolerance, and asset attributes. To address this, the study conducts empirical tests across three dimensions: management shareholding ratios, enterprise-specific risk factors, and industry characteristics. The regression results are presented in Table 9.

1. Heterogeneity based on management shareholding ratios

Tables 9(1) and (2) are grouped according to the median management shareholding ratio. The results demonstrate that FEPU's inhibitory effect

on digital transformation is more pronounced in samples with lower shareholding ratios (with significant inter-group differences at the 10% level). This phenomenon primarily stems from the interplay between principal-agent conflicts and benefit convergence effects. When management shareholding is low, organizations are prone to short-termism and may cut long-term digitalization budgets in response to policy volatility, driven by defensive motives for short-term compensation and job security. Conversely, high shareholding ratios effectively leverage benefit convergence effects, empowering management with strategic resilience and mitigating the negative impacts of uncertainty shocks.

2. Heterogeneity Based on Enterprise Trait Risks

Tables 9 columns (3) and (4) categorize enterprises based on their trait risk levels. Regression analysis reveals that FEPU exhibits a pronounced inhibitory effect in low-risk enterprises, while this suppression significantly diminishes in high-risk firms (with statistically significant inter-group differences at the 5% level). This counterintuitive finding can be explained through the comfort zone effect: Low-risk enterprises remain entrenched in stable operational comfort zones, making them highly sensitive to sudden external disruptions. Such conditions frequently trigger state maintenance bias, prompting them to urgently freeze high-risk transformation projects for self-preservation. In contrast, enterprises operating in high-risk environments have developed strong risk tolerance and a pressing need for digital transformation to break through challenges, resulting in their transition pace being less influenced by perceived policy impacts.

Table 9. Heterogeneity Analysis

	(1)	(2)	(3)	(4)	(5)	(6)
	The management's shareholding ratio is low.	Management holds a high shareholding ratio	Low enterprise characteristic risk	The risk associated with the company's characteristics is high.	non-manufacturing industry	manufacturing industry
FEPU	-0.387***	-0.246**	-0.413***	-0.208**	-0.550***	-0.212**
	(-4.230)	(-2.392)	(-4.451)	(-2.054)	(-4.768)	(-2.508)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
_cons	-1.887**	-1.764*	-3.409***	-1.981***	-3.485***	-1.668**
	(-2.210)	(-1.860)	(-4.178)	(-2.668)	(-3.270)	(-2.188)
Firm_FE	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Inter-group coefficient difference test	-0.141*		-0.206**		-0.338***	
N	12285.000	12312.000	12007.000	12094.000	8227.000	16821.000
r2_a	0.783	0.852	0.802	0.830	0.860	0.780

3. Heterogeneity Based on Industry Attributes

Columns (5) and (6) of Table 9 categorize the sample into non-manufacturing and manufacturing sectors. The results indicate that the inhibitory effect of FEPU on the non-manufacturing sector is significantly stronger than on the manufacturing sector, with the inter-group difference being highly significant at the 1% level. This divergence stems from differences in underlying asset attributes and investment reversibility. Manufacturing digitalization typically involves heavy-asset investments with high asset specificity, characterized by irreversibility and strong implementation inertia; bolstered by long-term national strategic endorsement, it exhibits relative immunity to short-term policy fluctuations. In contrast, transformations in non-manufacturing sectors such as services and the internet are predominantly asset-light and software-intensive, featuring highly reversible investments and extreme sensitivity to regulatory reviews like data compliance, making them more prone to adopting a wait-and-see strategy involving policy suspension or retreat.

7. Conclusion and Suggestion

During the intersection period of digital China strategy advancement and complex macroeconomic fluctuations, this paper empirically examines the impact of corporate perception of microeconomic policy uncertainty (FEPU) on digital transformation and its underlying mechanisms based on annual report data of China A-share listed companies from 2010 to 2023. The study draws the following

key conclusions: First, corporate subjective perception of economic policy uncertainty significantly inhibits their digital transformation process. Second, the mechanism indicates that intensified external financing constraints, induced by managerial short-sightedness, and weakened organizational risk-taking capacity (i.e., obstruction of the "capital chain-decision chain-risk chain") constitute the three major transmission channels through which policy perception hinders transformation. Third, heterogeneity characteristics reveal that when corporate management holds lower equity stakes, exhibits smaller inherent risk traits, and operates in non-manufacturing sectors, their perception of policy volatility becomes more sensitive to digital transformation, resulting in more pronounced inhibitory effects.

Based on the aforementioned conclusions, this paper proposes the following recommendations: First, macro policy adjustments should avoid frequent changes by establishing reasonable policy buffer periods in key areas such as data compliance and fiscal subsidies, thereby reducing panic perception among micro entities. Regulatory authorities should guide financial institutions to innovate specialized credit products, explore data asset collateral mechanisms and risk compensation funds, and precisely address corporate financing challenges during transformation. Second, boards of directors should deepen long-term interest alignment mechanisms by moderately increasing management shareholding ratios or introducing long-term equity incentives. Strengthening aligned interests can mitigate career-related anxieties caused by external turbulence and equip management with strategic resilience across economic cycles. Third, enterprises should leverage digital technologies to build customized macro policy risk dashboards, shifting from passive risk absorption to proactive management while addressing status quo maintenance biases in low-risk enterprises. During policy volatility periods, priority should be given to implementing light-asset, modular, and reversible SaaS projects through phased investments combined with real option strategies, effectively controlling trial-and-error costs while preserving future growth potential.

References

[1] Baker S R, Bloom N, Davis S J. Measuring economic policy uncertainty. The quarterly journal of economics, 2016, 131(4): 1593-1636.

[2] Nie H H, Ruan R, Shen J. Corporate uncertainty perception, investment decision-making and financial asset allocation. World Economics, 2020, 43(06):77–98.

[3] Bloom N. Bloom N. The impact of uncertainty shocks. econometrica, 2009, 77(3): 623-685.

[4] Xiong Zhengde, Zhu Jialei, Yao Zhu. Research on the Impact of Economic Policy Uncertainty on Corporate Innovation: A Discussion on the Moderating Effect of Digital Transformation. Scientific Research Management, 2025, 46(10):115–124.

[5] Hao D P, Cao L J. Global economic uncertainty and spillover effects on the United States: An empirical study based on big data methodology. Economic Issues Exploration, 2020, (08):105-113.

[6] Deng W, Song Q H, Yang M. Economic Policy Uncertainty and Commercial Bank Asset Hedging. Economics (Quarterly), 2022, 22(01):217-236.

[7] Guo X X. How does economic policy uncertainty affect strategic choices of private enterprises? Enterprise Economics, 2026, 45(01):48-58.

[8] Wu F, Hu H Z, Lin H Y, et al. Digital Transformation of Enterprises and Capital Market Performance: Empirical Evidence from Stock Liquidity. Management World, 2021, 37(7):130-144.

[9] Liao G M, Hu Z L, Gu N H. Perception of corporate policy uncertainty and digital transformation: Micro-level evidence from China listed companies. Economic System Reform, 2024, (05):185-191.

[10] Chu W H. Impact of economic policy uncertainty on commercial bank credit issuance and coping strategies. China Market, 2026, (08):22-25.

[11] Yuan C, Xiao T S, Geng C X, Sheng Y. Digital Transformation and Enterprise Division of Labor: Specialization or Vertical Integration. China Industrial Economics, 2021, (09):137-155.

[12] Zhao Z Y, Wang W C, Li X S. How Digital Transformation Affects Total Factor Productivity of Enterprises. Finance & Trade Economics, 2021, 42(07):114-129.