# Ending Rat-Race Competition in Corporate Development: The Role of Trial-and-Error Costs and Institutional Flexibility

Tianyu Wang*

Anhui University of Finance and Economics, Bengbu, 233030, China

20242844@aufe.edu.cn

**Abstract.** With the deepening of reform and opening-up, China's domestic economy has evolved into an extraordinarily complex and diverse landscape, where social issues stemming from rat-race competition have become particularly pronounced. This paper utilizes questionnaire data from Chinese A-share listed companies and data from the National Bureau of Statistics to construct an empirical model, aiming to explore how to resolve the predicament of "rat-race competition" faced by Chinese enterprises during the phase of "stock competition" in the economy. The study reveals that the underlying cause of rat-race competition is not merely resource scarcity but rather the high cost of trial and error resulting from a rigid institutional environment. When regulatory frameworks become excessively stringent and detailed, the potential costs of failure associated with innovative exploration are elevated to unbearable levels, compelling rational decision-makers to forego high-risk, high-reward pioneering innovations in favor of non-productive, hyper-intensified internal competition within existing rules. The core theoretical contribution of this paper lies in constructing an integrated analytical framework that connects macro-level institutional environments with micro-level corporate behaviors.

**Keywords:** Rat-Race Competition; Corporate Innovation; TVP-VAR; Corporate Development

## 1 Introduction

Since the launch of reform and opening-up, China's economy has achieved remarkable growth, accompanied by a rapid accumulation of social wealth. However, after decades of rapid development, the economy has gradually transitioned into a phase of moderated growth, shifting from "incremental expansion" to "stock competition." [16]. As the growth rate of new opportunities and high-quality resources slows, while the number of highly educated individuals continues to rise, competition for limited development opportunities is intensifying. This trend exerts profound structural pressure on China's economic system, the essence of which lies in systemic innovation fatigue and declining adaptive efficiency [5].


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Traditional Chinese governance models often rely on increasingly detailed and stringent rules to establish order and enhance efficiency [17]. However, when standardization is pursued to an extreme, it can easily devolve into "dogmatism" [14]. Under such circumstances, rules cease to serve public interests, social efficiency, or fairness and justice. Instead, they become an invisible force that suppresses societal vitality, fosters formalism, and ultimately undermines substantive justice. A direct consequence is the prohibitive escalation of costs associated with exploration and trial-and-error that deviate from established paths. Constrained by high trial-and-error costs, the optimal strategy for rational individuals is not to engage in risky innovation but to pursue extreme internal competition within an increasingly narrow regulatory framework—this constitutes the core mechanism of the Rat-Race Competition dilemma. Concurrently, against the backdrop of an increasingly complex international competitive landscape, China's economic development faces dual challenges: breaking through rising trade barriers erected by developed countries and coping with sustained pressure from the traditional cost advantages of developing countries [17]. Consequently, exploring innovation-driven development pathways and cultivating new growth points within internationally competitive industrial economies have become imperative for China to achieve high-quality development. In this context, fundamentally resolving the Rat-Race Competition dilemma is key to upgrading the industrial structure towards the higher end of the global value chain [6].

The cost of trial-and-error is critical for understanding micro-level corporate decision-making [1]. It directly shapes firms' innovation incentives and systematically guides the allocation of competitive resources. From the perspective of corporate strategy, when trial-and-error costs are high, rational firms tend to shy away from innovation. Allocating limited resources to marginal improvements in existing technologies and markets or engaging in exclusionary competition becomes a "safer" option. Conversely, lower trial-and-error costs significantly reduce the survival threat faced by firms due to innovation failure. Such an environment typically relies on robust bankruptcy protection systems, active venture capital markets, and a business culture tolerant of failure. Under these conditions, rational entrepreneurial decisions shift towards pursuing the potential high returns of innovation, as the gains from a single successful innovation can often offset the costs of multiple failures. Consequently, the focus of competition transitions from efficiency contests under existing rules to the exploration and definition of new technologies, markets, and business models [12].

Policy flexibility serves as the crucial link coupling macro-level policies with micro-level corporate behavior. Appropriate institutional flexibility does not imply disorder or a lack of rules; rather, it denotes the capacity of an institutional system to adapt and self-adjust in response to environmental changes, new knowledge, and the innovative behaviors of micro-level actors [11]. The core characteristic of a flexible institution is its ability to effectively manage and reduce the trial-and-error costs associated with corporate innovation. Existing literature suggests that policy flexibility is essentially an adaptive and dynamic adjustment process, reliant on continuous feedback interactions between policy objectives and market demands [3]. It requires the policy system to proactively respond to and adapt to rapid changes in the external

environment [16]. Given that innovation activities constantly reshape the environmental landscape, dynamic capability theory provides a useful lens for understanding how policy systems can effectively address this challenge. Specifically, the policy system must first keenly perceive and accurately identify external environmental changes, particularly technological trends and emerging demands at the market frontier. It should then systematically integrate new insights into the existing policy framework through pilot explorations, impact assessments, and experiential learning. Finally, based on sufficient learning, it should facilitate the flexible restructuring and strategic transformation of policy tools, regulatory mechanisms, and even organizational structures.

Although considerable research exists on Rat-Race Competition [17], few studies have investigated its root drivers from the perspective of institutions and corporate behavioral motivations. Existing academic research on Rat-Race Competition can be categorized into three types. First, some studies prioritize describing the phenomenon over analyzing its underlying mechanisms. These works often focus on depicting various manifestations of Rat-Race Competition, frequently attributing it to macro-level factors [7]. While such analyses serve a warning function, they fail to address a more fundamental question: why do some sectors or organizations continue to innovate and thrive under the same macroeconomic conditions, while others remain mired in Rat-Race Competition? This suggests the existence of explanatory variables closer to the actors than broad macro-level trends. Second, other studies critique the failure of rules without adequately reflecting on their distortion. These works highlight issues of rule ineffectiveness but often focus on poor implementation or the absence of rules, implicitly proposing "more and stricter rules" as the solution [8]. This approach overlooks the core of the problem: Rat-Race Competition may stem from "institutional alienation" caused by excessive or rigid rules—where rules transform from tools serving human ends into ends in themselves. Relying on strengthening the existing rule system is not only futile but may exacerbate Rat-Race Competition. Third, analytical perspectives remain fragmented, lacking a solid micro-level behavioral foundation. Economic studies emphasize resource misallocation and incentive distortions, sociological studies focus on social structural pressures, and psychological studies examine individual motivations and burnout. While these perspectives offer valuable insights, they fail to construct a unified analytical framework connecting macro-level institutional environments, micro-level behavioral strategies, and ultimate economic outcomes [2] [14]. In particular, there is a lack of dynamic analysis examining how key mediating variables, such as corporate behavioral motivations, evolve with changes in the institutional environment.

This paper centers on the core question of "how to terminate Rat-Race Competition in corporate development," exploring the critical roles of trial-and-error costs and policy flexibility [7]. It argues that as China's economy transitions from the high-growth phase of "incremental expansion" to the "stock competition" phase, excessive competition for limited development opportunities leads to systemic innovation fatigue and declining adaptive efficiency—the Rat-Race Competition dilemma. The underlying cause lies in an overly rigid and detailed rule system that raises the cost of trial-and-error for exploration and innovation to unsustainable levels, forcing

rational decision-makers to forego high-risk innovation in favor of extreme internal competition within existing rules. The key theoretical contribution of this paper is the construction of an integrated analytical framework linking macro-level institutional environments with micro-level corporate behavior. This framework systematically demonstrates that policy flexibility is the critical variable coupling macro-level governance with micro-level innovation. By influencing trial-and-error costs, which directly determine corporate innovation incentives, policy flexibility ultimately shapes whether firms adopt pioneering innovation strategies or resort to Rat-Race Competition [15]. A flexible institutional system can effectively reduce the uncertainty and potential risks associated with corporate innovation, thereby shifting the focus of competition from zero-sum games in existing markets to the pioneering exploration of new markets, technologies, and models. Theoretically, this study offers a novel and systematic perspective for understanding Rat-Race Competition. Practically, it provides clear policy guidance and actionable pathways for transitioning China's economy from "stock competition" to "innovation-driven" high-quality development [9].

The remainder of this paper is structured as follows: Section 2 reviews the relevant literature to establish the theoretical foundation. Sections 3 and 4 present the empirical model and report the empirical results, respectively. Section 5 discusses the findings, and Section 6 concludes the study.

## 2 Research Design

### 2.1 Model Construction

Before conducting the empirical analysis, stationarity tests were first performed on the variables of the model to avoid issues such as spurious regression. The test results, as shown in Table 8, indicate that all variables become stationary at the 1% significance level after first-order differencing. Furthermore, the optimal lag order for the TVP-VAR model was determined. Based on criteria such as HQIC, BIC, and AIC, the optimal lag order for the model was identified as 4, with the test results presented in Table 9.

While the preceding analysis has explored the impacts of policy flexibility and trial-and-error costs on enterprise development, the potential influence of policy flexibility on trial-and-error costs itself raises the possibility of spurious statistical relationships. Furthermore, the aforementioned findings are constrained by a relatively small sample size, and the inherent randomness and uncertainty in the results warrant further consideration. To more accurately uncover the intrinsic linkages among policy flexibility, trial-and-error costs, and enterprise development—particularly their independent and joint effects—this study employs a Time-Varying Parameter Vector Autoregression (TVP-VAR) model for empirical testing (Mo et al., 2025).

The selection of the TVP-VAR model is primarily motivated by the following considerations: the dynamic interactions among these three variables are likely to display time-varying and nonlinear patterns across different phases of economic development, and their data-generating processes are often subject to stochastic volatility. Conventional Vector Autoregression (VAR) models, which assume fixed coefficients, vari-

ances, and covariances, are ill-suited to capturing the evolving interdependencies among variables over time. In contrast, the TVP-VAR model accommodates time-evolving parameters, offering the flexibility required to accurately represent the dynamic linkages among economic variables, thereby aligning effectively with the time-varying nature of the relationships under investigation in this study.

### 2.1.1 TVP-VAR model.

The TVP-VAR model is an extension of the traditional VAR model. Therefore, we begin by introducing the standard VAR model formulation:

$$Ay_t=F_1y_{t-1}+F_2y_{t-2}+\ldots+F_sy_{t-s}+\mu_t,t=s+1,\ldots,n. \tag{1}$$

In the equation, $y_t$ is a $k \times 1$ vector of observable variables; $A, F_1, F_2, F_s$ are $k\times k$ coefficient matrices; $\mu_t$ is a $k\times 1$ vector of disturbance terms following a normal distribution. $\mu_{t\sim}N(0,\Sigma\Sigma')$, where $\Sigma$ is a $k\times k$ diagonal matrix and $A$ is a lower triangular matrix.

$$\Sigma=\begin{pmatrix}\sigma_1 & 0 & \ldots & 0\\ 0 & \ddots & \ddots & \vdots\\ \vdots & \ddots & \ddots & 0\\ 0 & \ldots & 0 & \sigma_k\end{pmatrix} A=\begin{pmatrix}1 & 0 & \ldots & 0\\ \alpha_{21} & \ddots & \ddots & \vdots\\ \vdots & \ddots & \ddots & 0\\ \alpha_{k1} & \ldots & \alpha_{k,k-1} & 1\end{pmatrix}$$

Let $B_i=A^{-1}F$, where $i$=1, …, $s$. Then the formula is transformed into:

$$y_t=B_1y_{t-1}+B_2y_{t-2}+\ldots+B_sy_{t-s}+A^{-1}\sum\varepsilon_t,\varepsilon_t\sim N(0,I_k). \tag{2}$$

Stacking the vectors $B_i$ into row vectors to forming a $k^2s*I$-dimensional vector $\beta$. Define $X_t=I_t\otimes(y_{t-1},\ldots y_{t-s})$

The model is simplified to:

$$y_t=X_t\beta+A^{-1}\sum\varepsilon_t \tag{3}$$

Equation (3) represent a Structual Vector Autoregression (SVAP) model, with the coefficients dynamically extended as follows:

$$y_t=X_t\beta_t+A^{-1}\sum\varepsilon_t,t=s+1,\ldots,n. \tag{4}$$

Equation (4) represent a Time-Varying Parameter Vector Autoregression (TVP-VAR) model. The coefficients in the model are $\beta_t$, $A_t$ and $\sum t$ in the model exhibits time-varying characteristics and it is assumed that $\alpha_t=(\alpha_{21},\alpha_{31},\alpha_{32},\alpha_{41},\ldots,\alpha_{k,k-1})'$ is a stacked vector composed of the lower triangular elements of $A_t$. The stochastic volatility matrix is defined as $h_t=(h_{1t},\ldots,\alpha_{kt})'$, and we set and $h_{jt}=\log\sigma_{jt}^2,j=1,\ldots k,t=s+1\ldots,n$. Additionally, all parameters in Equation (4) are assumed to follow a random walk process:

$$\begin{pmatrix} \varepsilon_t \\ \mu_{\beta_t} \\ \mu_{\alpha_t} \\ \mu_{h_t} \end{pmatrix} \sim N\left(0, \begin{pmatrix} I & 0 & 0 & 0 \\ 0 & \Sigma_\beta & 0 & 0 \\ 0 & 0 & \Sigma_\alpha & 0 \\ 0 & 0 & 0 & \Sigma_h \end{pmatrix}\right)$$

$$\beta_{t+1}=\beta_t+\mu_{\beta_t},\alpha_{t+1}=\alpha_t+\mu_{\alpha_t},h_{t+1}=h_t+\mu_{h_t},t=s+1,\ldots,n$$

Where, $\beta_{t+1} \sim N\left(\mu_{\beta_0}, \sum \beta_0\right)$, $\alpha_{t+1} \sim N\left(\mu_{\alpha_0}, \sum \alpha_0\right)$, $h_{t+1} \sim N\left(\mu_{\gamma_0}, \sum \gamma_0\right)$.

### 2.1.2 Model Specification.

This paper employs the MCMC algorithm to estimate parameters, with the model parameters assumed to following prior probability distributions:

$$(\Sigma_\beta)_i^{-2} \sim Gamma(40,0.02), (\Sigma_\alpha)_i^{-2} \sim Gamma(40,0.02), (\Sigma_h)_i^{-2} \sim Gamma(40,0.02), \mu_{\beta_0}$$

$$=\mu_{\alpha_0} = \mu_{h_0} = 10 \times I$$

## 2.2 Variable Selection and Data Description

### 2.2.1 Policy Flexibility.

The core of policy flexibility lies in its capacity to respond swiftly and effectively to internal and external changes. Particularly when facing new challenges, it should safeguard people's "boundary control" through formal policies and practices—granting them greater autonomy and control over their work roles. The most direct and quantifiable manifestation of this responsiveness is fiscal expenditure allocation. A government with high policy flexibility, upon observing society trapped in rat-race competition and a lack of innovation vitality, will proactively reduce trial-and-error costs for individuals and enterprises by significantly increasing expenditures in areas such as education, basic research, social security, and entrepreneurship support. Therefore, the growth rate of fiscal expenditure in these key sectors serves as an indicator of whether policies aim to "terminate rat-race competition" (Wenjuan & Zhao, 2023). This study uses the year-on-year growth rate of fiscal expenditure as a proxy variable for policy flexibility, with data sourced from the National Bureau of Statistics of China (2000–2020).

### 2.2.2 Trial-and-Error Cost.

The most direct component of trial-and-error cost, particularly economic cost, is the cost of capital. When enterprises or individuals seek to innovate or experiment (i.e., engage in "trial and error"), they often require financial support. The interbank lending rate—the interest rate at which financial institutions borrow short-term funds from one another—serves as one of the benchmark rates in the financial system. This rate transmits to banks' lending rates, thereby affecting loan costs for enterprises, especially small and medium-sized enterprises that most rely on funding for trial-and-error activities. Additionally, the level of the interbank lending rate reflects the liquidity conditions of the financial system (Cocco et al., 2009). A low interbank lending rate indicates ample market liquidity, with banks having sufficient funds to lend at lower costs. Conversely, a high rate signals tight liquidity, making credit scarce and expensive

for enterprises. In a tight-credit, high-cost capital environment, enterprises tend to become conservative, reducing non-essential and risky expenditures (i.e., "trial and error") to prioritize survival. This study uses the interbank lending rate as a proxy variable for trial-and-error cost, with data sourced from the National Bureau of Statistics of China (2000–2020).

#### 2.2.3 Enterprise Development.

Typically, the total number of enterprises in an economy during a specific period can be viewed as an indicator of its developmental vitality: the number tends to increase during economic upswings and decrease during downturns (Robu, 2013). However, this study aims not only to measure development but also to reveal the intensity of rat-race competition within that development. With this objective in mind and considering China's basic economic system, this paper constructs a new metric: the "ratio of operating revenue of state-owned and state-controlled industrial enterprises to their number." An increase in this ratio indicates an expansion in the average output scale per state-owned enterprise, reflecting improved resource allocation efficiency and development quality. A decrease, however, suggests potential over-competition and a tendency toward rat-race competition. Data are sourced from the National Bureau of Statistics of China (2000–2020).

### 2.3 Empirical Results

This study employs the Markov Chain Monte Carlo (MCMC) algorithm for simulation sampling. After 20,000 iterations, a valid sample was obtained. The parameter estimation results are presented in Table 1、2 and Figure 1.

As shown in Table 3, the posterior means of all parameters fall within their respective 95% confidence intervals. The Geweke convergence diagnostic (CD) values are all less than 1.96 (the critical value at the 5% significance level). Only two inefficiency factors exceed 100, which is considered acceptable. The sampling process yielded 61 uncorrelated samples from the 20,000 iterations, which supports valid posterior inference for the model.

Figure 1 demonstrates that the sample autocorrelation coefficients decline steadily, the sample paths are relatively stable, and the sample distributions exhibit good convergence properties. These indicators collectively suggest that the parameter estimates of the model are valid and reliable (Jebabli et al., 2014).

## 3 Impulse Response Analysis

Figure 3 presents the equidistant impulse response functions, depicting short-term effects at lags 6, 12, and 18 periods, and medium-to-long-term effects at lags 24, 36, and 48 periods. The horizontal axis represents the time horizon, while the vertical axis indicates the magnitude of the impulse response. The first row of Figure 2 displays the impulse responses of different variables to a one standard deviation shock in the interest rate, and the second row shows responses to a one standard deviation shock in the trial-and-error cost.

According to the graph in the first row, third column, an increase in the interest rate exhibits a significant negative effect on sustainable enterprise development, indicating that rising interest rates elevate the level of rat-race competition within firms. The graph in the second row, third column, reveals that an increase in policy flexibility exerts a fluctuating negative effect on sustainable enterprise development, suggesting that rising costs also intensify rat-race competition, thereby providing further validation for the model.

Notably, the impulse response curves collectively reached a trough around 2002. This pattern is likely attributable to the landmark event of China's accession to the World Trade Organization (WTO) in 2001, which substantially impacted the domestic economic system. Enterprises were compelled to invest resources in technological transformation, brand upgrading, and compliance management to adapt, consequently increasing the intensity of rat-race competition.

A significant divergence in the curves emerged after China's WTO accession, reflecting a structural shift in the relationship between "policy" and "market" forces within the underlying logic of China's economic operation. Specifically, the Shanghai World Expo held in 2010 effectively mitigated the negative impact of interest rates on rat-race competition among firms. Regarding policy flexibility, following WTO accession, the Chinese government was required to adhere to new international rules, leading to a reduction in direct subsidies and interventions. The role of policy increasingly shifted towards infrastructure development, macroeconomic stability, and institutional optimization, which relatively diminished the direct stimulative effect of individual policy shocks.

Concurrently, as firms were thrust into the tide of global competition, cost control abruptly became a critical determinant of competitiveness. The effects of market interest rate shocks were markedly amplified. Whether through cost reductions from technological innovation significantly enhancing international competitiveness, or the severe pressures from rising costs, the impact became far more pronounced than before. Consequently, a new dynamic relationship was formed: macro-level policies focused on counter-cyclical adjustments, attempting to uplift enterprise development to counteract downward cyclical pressures, while the constraints imposed by global market interest rates acted as a potent countervailing force, continually suppressing corporate profit margins and developmental momentum.

To provide an in-depth characterization of the dynamic transmission mechanism and time-varying features among policy flexibility, trial-and-error costs, and enterprise development, this study further quantifies the time-varying characteristics of policy effect lag and cost shock persistence by comparing impulse responses over multiple periods (6/8/12 periods).

Figure 3 reveals that shocks to both policy flexibility and the interest rate suppress sustainable enterprise development. Specifically, the impact of a policy flexibility shock on enterprise development exhibits significant lagged effects. The short-term (6-period) response is relatively weak, becoming substantially stronger only in the medium-to-long term (8 and 12 periods). This indicates that the effects of fiscal support policies require time to fully materialize. In contrast, the transmission of an interest rate shock displays notable immediacy, peaking rapidly in the short term (6

periods) but subsequently decaying continuously, suggesting that interest rate shocks act quickly but have relatively limited persistence.

Furthermore, the persistence of interest rate shocks has a particularly profound impact on enterprise development. The inhibitory effect generated shows no significant recovery even in the long term (12 periods), further highlighting the difficulty firms face in absorbing market pressures. Conversely, the buffering effect of fiscal flexibility on interest rates is more gradual and manifests more clearly in the medium-to-long term, indicating that fiscal flexibility can, to some extent, counterbalance interest rate fluctuations.

**Table 1.** Stability test[1]

| Variable | Validate Model | Statistic | 1% critical value | Significance | Test results |
|---|---|---|---|---|---|
| Rat-Race Competition | PP | -20.398 | -3.99 | 0 | Stable |
| Policy Flexibility | PP | -52.202 | -3.99 | 0 | Stable |
| Enterprise Development | PP | -35.205 | -3.99 | 0 | Stable |
| Rat-Race Competition | ADF | -5.57 | -3.994 | 0 | Stable |
| Policy Flexibility | ADF | -6.38 | -3.994 | 0 | Stable |
| Enterprise Development | ADF | -6.032 | -3.994 | 0 | Stable |
| Rat-Race Competition | KPSS | 0.0537 | 0.216 | - | Stable |
| Policy Flexibility | KPSS | 0.0444 | 0.216 | - | Stable |
| Enterprise Development | KPSS | 0.0759 | 0.216 | - | Stable |

**Table 2.** Optimal Lag Order Test Results

| lag | AIC | BIC | HQIC |
|---|---|---|---|
| 1 | 24.1523 | 25.8921 | 24.8325 |
| 2 | 23.9765 | 25.9014 | 24.7238 |
| 3 | 23.8942 | 25.7829 | 24.6352 |
| 4 | 23.8299* | 25.8439* | 24.6482* |

**Table 3.** Model Parameter Estimation Results

| Parameter | Mean | Stdev | 95%L | 95%U | Geweke | Inef. |
|---|---|---|---|---|---|---|
| sb1 | 0.0228 | 0.0027 | 0.0184 | 0.0289 | 0.029 | 14.20 |
| sb2 | 0.0226 | 0.0026 | 0.0183 | 0.0282 | 0.644 | 16.16 |
| sa1 | 0.2517 | 1.5626 | 0.0412 | 1.1560 | 0.106 | 4.89 |
| sa2 | 0.1149 | 0.2105 | 0.0393 | 0.4389 | 0.263 | 33.60 |
| sh1 | 0.6884 | 0.1203 | 0.4560 | 0.9431 | 0.446 | 167.15 |
| sh2 | 0.9757 | 0.3016 | 0.5368 | 1.5922 | 0.000 | 326.96 |

[1] Note: The KPSS statistic has a maximum value of 0.0444 (at lag 15), the PP test statistic is the Z(t) statistic, and the ADF test statistic is the ADF statistic.

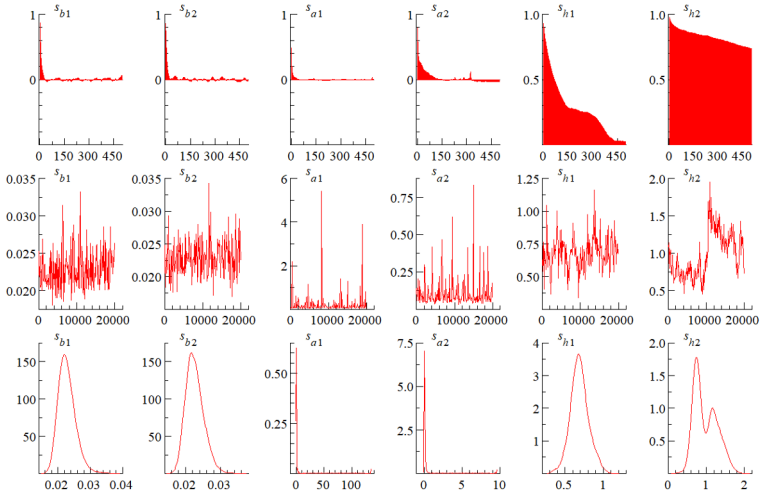

**Fig. 1.** Sample Autocorrelation Coefficient, Trace, and Posterior Distribution[2]

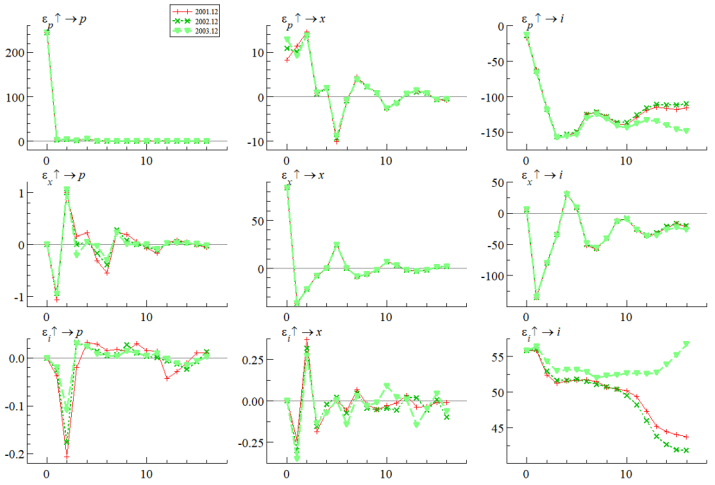

**Fig. 2.** Equally Spaced Impulse Response of the Variable[3]

[2] Note: Generally speaking, if autocorrelation is present, the graphical characteristic is as shown in the first row of Figure 2: a sharp descent from a high initial value. The second row illustrates the stationarity of the sampling path; if the fluctuations remain within a certain range with few extreme values, such a path is considered stationary. The third row shows the distribution of the sampled values; if the graph resembles a normal distribution, the sampling is deemed effective.

[3] Note: The interbank lending rate is denoted as p, the fiscal expenditure growth rate as x, and the ratio of operating revenue to the number of state-owned enterprises as i. A negative co-

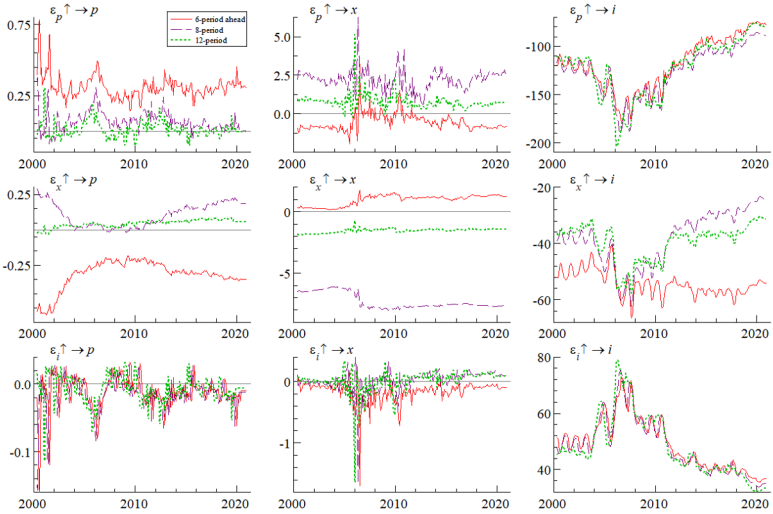


**Fig. 3.** Impulse Response of Variables over Time

## 3.1 Robustness Test

### 3.1.1 Variable Selection and Data Description.

*(1) Replace core variable*[4]

To further ensure the robustness of the conclusions, the study replaced the core variable—Rat-Race Competition—and the indicator for measuring trial-and-error costs with more macro-level metrics, and substituted monthly data with annual data for a broader perspective. To quantify the degree of Rat-Race Competition, we referred to relevant literature and used the ratio of Gross National Income (GNI) to Gross Domestic Product (GDP). In essence, "Rat-Race Competition" refers to zero-sum or negative-sum internal competition within a confined space. An economy with a low or declining GNI/GDP ratio indicates that corporate profits have not been effectively translated into employee wages, suggesting difficulties in acquiring incremental gains externally and a heightened focus on intense competition over existing internal resources.

For trial-and-error costs, we used the ratio of the year-on-year growth rate of the money supply and quasi-money (M2) to the Industrial Producer Purchase Price Index (1990=100) (%). The rationale is that when market liquidity is insufficient to cover the costs of corporate expansion, firms are unlikely to pursue growth. Instead, they

efficient indicates an inverse relationship, while the slope of the curve reflects the strength of the association.

[4] Note: After first-order differencing of the data, the stationarity test results show that the PP statistics are -4.715, -8.499, and -3.265, respectively, all indicating stationarity at the 1% significance level. Based on the AIC, BIC, and HQIC criteria, the optimal lag order for the TVP-VAR model is determined to be 4.

tend to allocate funds to financial investments, engaging in more extreme cost-based Rat-Race Competition. Thus, this indicator reflects the trial-and-error costs faced by firms in innovation—a higher value indicates lower trial-and-error costs. The results, as shown in Figures 4 and 5, are generally consistent with the earlier trends, confirming the robustness of the conclusions.

*(2) Instrumental Variable Test*

To eliminate the influence of policies on trial-and-error costs, we conducted further tests using an instrumental variable for trial-and-error costs to address endogeneity concerns. We employed the ratio of the Corporate Goods Price Index (CGPI) growth rate to the National Consumer Price Index (CPI) growth rate as the instrumental variable for trial-and-error costs, based on the following rationale. First, this indicator captures the structural contradiction between cost pressures faced by firms and returns in the end-consumer market. Specifically, an increase in this ratio essentially reflects the level of effective market demand. When effective demand is insufficient, firms' "profit expectations" and heightened "uncertainty" intensify, significantly raising their perceived trial-and-error costs and thereby suppressing innovation investment. Since the government's macroeconomic policies cannot directly influence effective market demand, the exogeneity condition of the instrumental variable is satisfied. After addressing endogeneity, the results, as shown in Figures 6 and 7, remain largely consistent with the earlier trends, confirming the robustness of the conclusions.

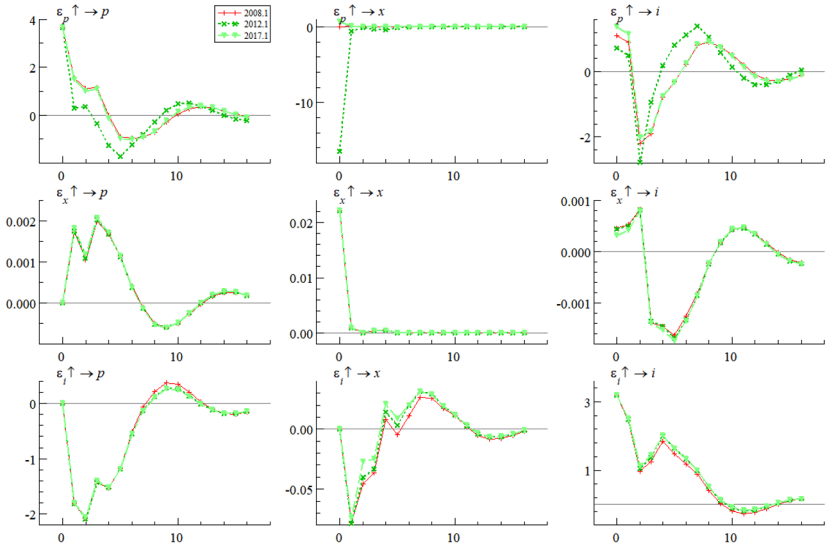


**Fig. 4.** Equally spaced impulse response diagram of the substituted core variable[5]

[5] Note: The fiscal expenditure growth rate is denoted as p, GNI/GDP as x, and the ratio of the year-on-year growth rate of money and quasi-money (M2) to the industrial producer purchase price index as i. A negative coefficient indicates an inverse relationship, and the curve slope reflects the strength of the association.

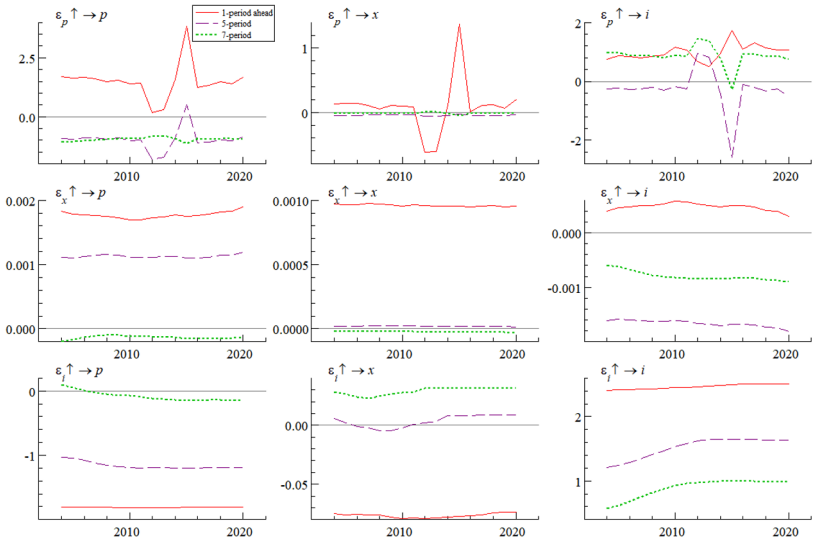


**Fig. 5.** Impulse response diagram of the timing of core variable replacement

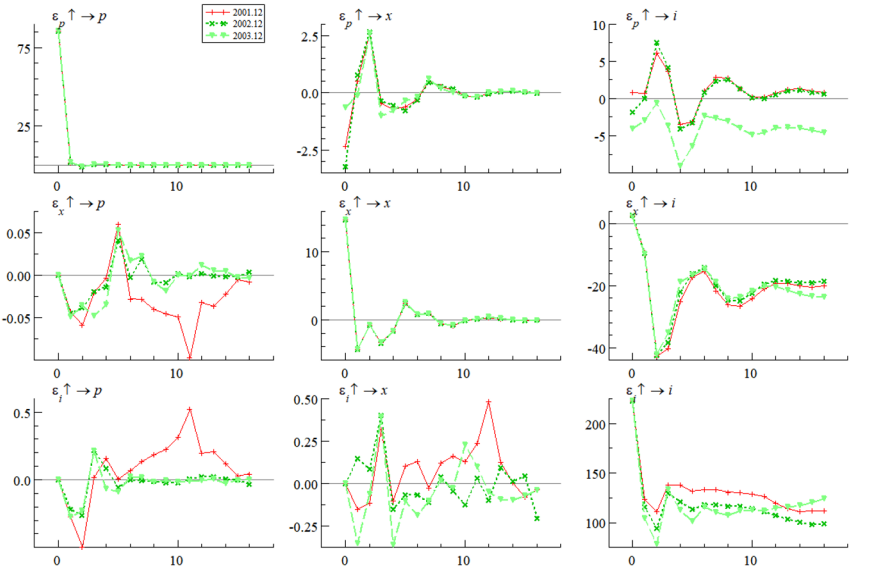


**Fig. 6.** Impulse response diagram with equally spaced intervals introducing instrumental variables

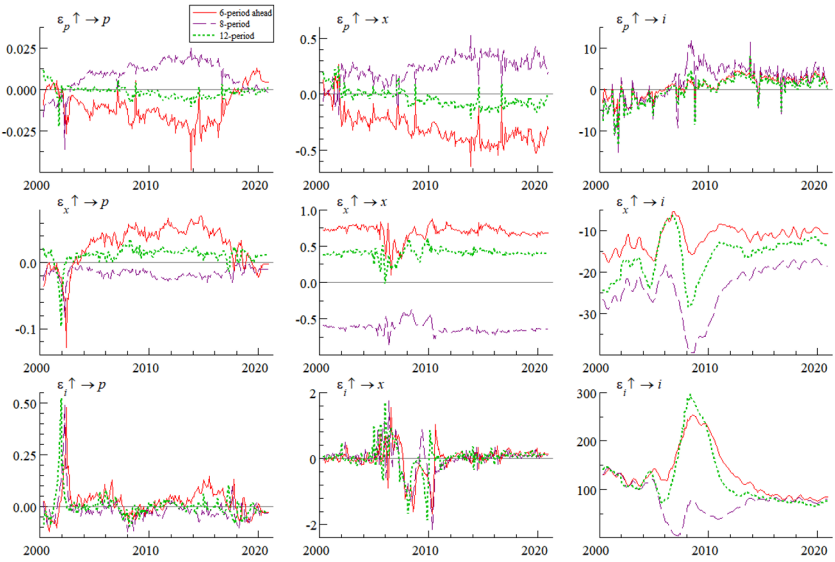


**Fig. 7.** Impulse response diagram of the timing of introducing instrumental variables

## 4 Conclusion

This study systematically demonstrates the pivotal roles of policy flexibility and trial-and-error costs in triggering and alleviating rat-race competition among enterprises. The findings reveal that rat-race competition cannot be simply attributed to the scarcity of market resources; its underlying formation mechanism lies more profoundly in the rigidity of the external institutional environment and the primary constraint imposed by high trial-and-error costs on firms' innovative behaviors. This constraint, in turn, systematically suppresses corporate willingness and capacity for innovation. When the policy system lacks flexibility and rules tend towards rigidity, the uncertainty and potential risks associated with corporate innovation activities are significantly amplified [10]. Within a rational decision-making framework, firms tend to avoid high-risk, long-cycle original exploration, focusing instead on intense internal competition within established rules, thereby falling into a rat-race cycle characterized by "high input, low breakthrough."[11] [4].

Based on the above mechanistic analysis, this study argues that the key to resolving rat-race competition lies in constructing an institutional system with high adaptability and continuous learning capabilities [12]. Such a system, through effective boundary control and dynamic adjustment mechanisms, can provide necessary error tolerance and adaptation periods for enterprises facing uncertainty and external shocks, thereby significantly reducing their trial-and-error costs. Within this institutional environment, the focus of corporate competition can shift from zero-sum struggles over existing resources to the more creative exploration of incremental value. Achieving this shift requires not only forward-looking and rapidly responsive policy design but also the establishment of regularized mechanisms for policy learning and iteration, enabling

the institutional system to continuously optimize alongside evolving market structures and technological conditions [13].

In summary, by integrating the perspective of micro-level corporate decision-making foundations with macro-level institutional dynamics, this study provides a comprehensive theoretical framework for understanding the formation mechanism and potential governance pathways for rat-race competition. This analysis not only deepens the academic discussion on the behavioral logic of firms in transitional economies but also offers valuable theoretical insights and practical implications for facilitating China's transition towards an innovation-driven, high-quality development stage.

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