Executive Turnover and Breakthrough Innovation: The Mediating Role of Strategic Persistence

Luo Zheng*

Sichuan University

Chengdu,sichuan ,China

1520759458@qq.com

Abstract

Breakthrough innovation is a key driver propelling listed companies toward sustained success and reinforcing their competitive edge in the market. However, frequent changes in core executives make it more challenging for enterprises to achieve breakthrough innovation. On the one hand, changes in senior management may disrupt an organization's existing R&D process and technological innovation resources, bringing risks and uncertainties to the organization and thereby increasing the difficulty of enhancing the breakthrough level of enterprise innovation. On the other hand, executive changes will bring about new successors. Executives with different leadership styles and cognitive levels will have a significant impact on the arrangement of an enterprise's innovation resources, thereby influencing the breakthrough innovation of the enterprise. Meanwhile, this study holds that strategic continuity plays a mediating role in it. Executive changes alter the strategic direction, strategic goals, organizational culture and core values of an enterprise, thereby hindering strategic persistence. Strategic continuity maintains the coherence of the enterprise's innovation resource arrangement and the continuity of innovation technology projects. This continuity expands the research cycle and depth of the R&D team on projects, creating more favorable conditions for the generation of breakthrough innovation achievements. We further verified our hypothesis through an empirical analysis of the panel data of 610 listed companies in China.

Keywords

Breakthrough Innovation; Executive Turnover; Strategic Persistence

1. Introduction

As the new wave of global technological revolution and industrial transformation intensifies, the innovative achievements of enterprises in the fields of science, technology and knowledge have expanded unprecedentedly. Innovation is an important component for enterprises to maintain their competitiveness, growth and survival capabilities[11], and it is also a key driving force for listed companies to achieve continuous success and consolidate their competitive advantages in the market. In scenarios where enterprises encounter operational challenges or experience development stagnation, management turnover is often regarded as a strategy aimed at stimulating the organization's innovative potential by introducing new leadership forces, thereby promoting technological breakthroughs and fundamental performance improvements for the enterprise[7]. Against the backdrop of global economic uncertainties, the frequency of executive turnover is consistent with the changing trend of the number of corporate innovation achievements. The situation of executive changes is becoming increasingly common and frequent The number of innovative achievements produced by enterprises has also shown a significant increase[9][12]. However, in recent years, an increasing amount of evidence has emerged indicating that, compared with the geometric growth in the number of innovative achievements, the growth of breakthrough innovative achievements has been increasingly slowing down[6]. The latter is the key driving force for enterprises to consolidate their competitive advantages and achieve sustained success. The downward trend of the latter not only weakens the driving force of innovation for a company's competitive advantage and sustained success, but also poses a significant threat to global

D. Magni et al. (eds.), *Proceedings of the 2026 3rd International Conference on Applied Economics, Management Science and Social Development (AEMSS 2026)*, Advances in Economics, Business and Management Research 389,

https://doi.org/10.2991/978-94-6239-672-2_68

efforts in important areas such as economic growth, human health and well-being, national security, and addressing climate change. Then, while executive changes increase innovation achievements, will they also trigger a leap in technological innovation within enterprises and lead to technological outputs with a higher breakthrough level?

To bridge the gap in existing literature, the question we study is: Does executive change have an impact on the breakthrough level of an enterprise's innovation achievements? If so, how does this influence occur? What are the internal and external boundary conditions that cause such an impact? We believe that executive changes have a negative impact on the breakthrough level of innovation achievements by undermining strategic persistence. Based on the data of Chinese listed companies, we conducted an empirical test on the above assumptions and discussed their impact on the theory and practice of enterprise innovation.

2. Models and Hypotheses

The resource orchestration theory emphasizes that enterprises adapt to environmental changes by dynamically managing and allocating resources[10]. From the perspective of resource orchestration theory, changes in the top management may mean a significant transformation in the way resources are identified, acquired, deployed and utilized within an enterprise[4]. Core executives play a significant role in coordinating strategic management actions at the entire enterprise level, has extensive decision-making power, including determining how enterprises allocate resources. However, these resources need to be effectively arranged in order to benefit the breakthrough level of enterprise innovation. Changes in top leadership may pose obstacles to breakthrough innovation, as the uncertainty in resource allocation and the discontinuity of strategic direction brought about by executive changes may suppress the continuity and accumulation of innovation resource input, thus making it difficult for the enterprise's innovation level to achieve breakthrough progress[2]. Specifically, the impact of executive changes on enterprise innovation depends on the enterprise's ability to adapt and reallocate innovation resources to cope with the constantly changing environmental conditions. Executive changes may lead to a re-evaluation of existing R&D directions and projects. Such strategic uncertainties and direction adjustments may result in the dispersion and redistribution of R&D resources, thereby reducing the breakthrough performance of enterprises in innovation in the short term.

The hindrance of executive changes to the breakthrough level of enterprise innovation may be achieved through the following two aspects. First, changes in senior management may disrupt the organization's existing R&D process and technological innovation resources, bringing risks and uncertainties to the organization and thereby increasing the difficulty of enhancing the breakthrough level of enterprise innovation.

Secondly, changes in senior management will bring about new successors. Executives with different leadership styles and cognitive levels will have a significant impact on the way enterprise resources are arranged. Innovative achievements with a high breakthrough level often require continuous investment of resources and are difficult to gain returns in a short period of time. Therefore, short-sighted managers will suppress the breakthrough level of enterprise innovation.

Therefore, we believe that executive changes will disrupt the organization's existing R&D process, undermine the continuity and accumulation of innovation resource investment, and bring risks and uncertainties to the organization. At the same time, due to the different cognitive frameworks and decision-making logics between the successor and the original senior executives, it may lead to a shift in the direction of enterprise resource allocation, with a greater focus on short-term gains. This results in insufficient resources for breakthrough innovation activities that require long-term investment, thereby hindering the development of the enterprise's innovation breakthrough level. Based on this, the following hypotheses are proposed:

H1: Executive changes can curb the breakthrough level of enterprise innovation.

Enterprise strategic continuity refers to the consistency and stability that an enterprise maintains in its strategic goals and directions, resource allocation, technological innovation and development, as well as its mission and aspirations during its development process. A clear strategic continuity plan is one of the most effective mechanisms to balance the innovation impact brought about by executive changes and maintain the core capabilities of an enterprise[3]. Strategic continuity buffers the uncertainties and risks brought about by the disruption of resource orchestration conventions and the switching of resource orchestration methods due to executive changes, thereby enhancing the breakthrough innovation performance of enterprises[8]. We propose that strategic continuity is negatively affected by executive changes, and at the same time, it mediates and buffers the impact of executive changes on the breakthrough level of enterprise innovation.Based on the above discussion, we propose:

H2: The negative correlation between executive change and the breakthrough level of enterprise innovation is mediated by the continuity of enterprise strategy.

3. Method

3.1 Data

The executive change data and enterprise financial data involved in this article mainly come from the Guotai 'an Database (CSMAR), and the patent data of listed companies come from the incoPat database. Guotai 'an Database (CSMAR) is a widely recognized enterprise data service provider, whose enterprise data is frequently cited in management research and enjoys public recognition[5]. IncoPat is a global intellectual property database that provides in-depth search and analysis services for patent information. As the CD index, an indicator for measuring the breakthrough level of enterprise innovation, requires patent citation data for the next five years, this paper takes the A-share listed companies on the Shanghai and Shenzhen stock exchanges from 2010 to 2019 as the research sample. After excluding ST and *ST enterprises, enterprises with abnormal financial data and missing data, as well as enterprises in the financial industry, our sample includes 610 enterprises. To control the influence of extreme values on the research results, in this paper, Winsorize all continuous variables by 1% up and down.

3.2 Variables

3.2.1 The breakthrough level of enterprise innovation

To represent the breakthrough level of enterprise innovation, we draw on the measurement methods of innovation breakthrough provided by Funk & Owen-Smith[1], and use the CD index to identify the breakthrough patents of each enterprise. The following equation defines the CD exponent of a focal patent at time t:

$$CDt=\frac{1}{n_t}\sum_k(-2f_{kt}\,b_{kt}+f_{kt})$$

Among them, k=(k_1, k_2,... k_n) is the vector vector of all subsequent patents that refer to the focal patent or the prior patent cited by the focal patent at time t. n_t is the number of references to the focal patent and the prior patent cited by the focal patent. If k refers to the focal patent, f_{kt} is equal to 1; otherwise, it is 0. If k refers to any prior patent of the focal patent, b_{kt} is equal to 1; otherwise, it is 0.

we identified the breakthrough patents in the patent application portfolio of each enterprise in the current year as patents with a positive CD index based on the positive citation situation within 5 years after the patent publication and all reverse citations of the focus patents. As the production of innovative achievements requires the accumulation of time, we have lagged behind the breakthrough

level indicator of enterprise innovation by two years. The breakthrough level of an enterprise's innovation (BI) is the logarithm of the count of all breakthrough patents applied for by the enterprise within one year (positive citations over five years) plus one. The larger the BI value, the higher the breakthrough level of the enterprise's innovation.

3.2.2 Executive Changes

We refer to the changes of the chairman and general manager, who have significant influence on the business operations of an enterprise, as executive changes. Specifically, we take 0 and 1 dummy variables respectively for executive changes. When there is a change in senior management, Turnover=1. When the executive remains unchanged, Turnover=0. The data on the changes of the chairman and the general manager is sourced from the CSMAR database.

3.2.3 Strategic Continuity

We define the continuity of enterprise strategy through the degree of strategic change of the enterprise. These variable measures the extent to which an enterprise's strategy remains unchanged over time, using the degree of fluctuation in the allocation of strategic resources in the organization's key areas within the annual interval to define strategic change.

With t as the focus year, calculate the variance $(t_i\text{-}T)^{2}/(n-1)$ for each strategic dimension of the enterprise over five years (t -1 to t+3). Next, the variance scores of each dimension are standardized by industry, using only the data points of the sample enterprises (mean =0, standard deviation =1), and multiplied by negative one to make the indicator conform to the concept of continuity (i.e., no strategic differences over time). Finally, the six standardized indicators are added together to obtain an overall measurement criterion, namely strategic Continuity (SP).

3.2.4 Control Variables

We have considered the key influencing factors of enterprise innovation and controlled the following variables. First, we have controlled the scale of the enterprise and its age. The scale of the enterprise is the logarithm of total assets, and the age of the enterprise is the logarithm of the number of years since its establishment. Second, we have controlled the company's net profit margin on total assets (net profit/total assets), asset-liability ratio (total liabilities/total assets), and TobinQ (market value/total assets). Because existing research suggests that financial performance and status are closely related to the redundant resources available for innovation, and enterprises with better performance and more financial resources tend to develop more new products. Thirdly, we have controlled whether the enterprise is a combination of two positions. If it is a combination of two positions, it takes 1; if not, it takes 0. Finally, we controlled the nature of the enterprise's equity, taking 1 for state-owned enterprises and 0 for non-state-owned enterprises. In addition, we used dummy variables to control for individual fixed effects and time fixed effects.

3.3 Statistical Analysis

In our empirical research, the preliminary analysis adopted the fixed effects model framework, taking the breakthrough level of enterprise innovation as the dependent variable. In all the regressions, we used the fixed effects of enterprises and the dummy variables of years to respectively control for the unobservable differences between enterprises and the changes in the economic cycle. To verify the applicability of the fixed effects model, we conducted the Hausman canonical test. The test results show that the fixed effects model is appropriate for all our regression analyses ($x2=42.82$; $p<0.01$). Based on this result, we decided to use the xtreg command in STATA software for estimation. This command can properly handle the fixed effects model of panel data, with enterprises as the grouping units for analysis. Furthermore, to correct the influence of heteroscedasticity of panel data and intra-group autocorrelation, we added the robust standard error of enterprise clustering.

4. Results

Table 1 presents the descriptive statistics and correlations of the main variables in our study. Executive changes are significantly correlated with strategic continuity and the breakthrough level of enterprise innovation (r=-0.079, p<0.01; r=-0.095, p<0.01; r=-0.053, p<0.01). Strategic continuity is significantly correlated with the breakthrough level of enterprise innovation (r=0.093, p<0.01). These results indicate that Hypothesis 1 and Hypothesis 2 are reasonable. Moreover, we conducted the VIF (Variance inflation factor) test on each variable. The maximum VIF was 2.04, less than 10, and the average VIF was 1.35. It can be seen that there is no serious multicollinearity problem among the variables.

We tested our hypothesis using hierarchical regression analysis. Table 2 reports our empirical results. We found that executive change was significantly negatively correlated with the breakthrough level of enterprise innovation (β=-0.061, p<0.01, Model 2), as well as with strategic continuity (β=-0.152, p<0.01, Model 5). There is a significant positive correlation between strategic continuity and the breakthrough level of enterprise innovation (β=0.023, p<0.05, Model 3).

H2 predicted the mediating role of strategic continuity in the relationship between executive change and the breakthrough level of enterprise innovation. As shown in Model 4 and Model 5, when strategic continuity is added, the impact of executive change on the breakthrough level of enterprise innovation decreases and remains significantly negatively correlated (β=-0.058, p<0.01). This indicates that strategic continuity mediates the impact of executive changes on the breakthrough level of enterprise innovation.

Table1.Descriptive statistics and correlations.

	Mean	S.D.	1	2	3	7	8	9	10	11	12
BI	1.208	1.392									
Turnover	0.269	0.444	-0.053								
SP	-0.013	2.418	0.093	-0.079							
Size	22.29	1.366	0.193	0.006	0.061						
Leverage	0.488	0.195	-0.025	0.022	-0.064	0.419					
ROA	0.044	0.059	0.026	-0.022	0.096	-0.028	-0.448				
Duality	0.171	0.377	0.051	-0.051	-0.006	-0.100	-0.083	0.065			
TobinQ	2.017	1.260	-0.054	-0.037	-0.043	-0.177	-0.168	0.145	0.037		
SOE	0.604	0.489	0.023	0.041	0.031	0.247	0.213	-0.163	-0.214	-0.066	
Firmage	2.701	0.334	0.071	0.033	-0.012	0.207	0.110	-0.173	-0.032	0.024	0.048

N=6100.

The coefficient is significant at p<0.05 when the absolute value of correlation is greater than 0.025.

Table 2. Moderating Mediating Effect Test.

	(1) BI	(2) BI	(3) BI	(4) BI	(5) SP
Turnover		-0.061***		-0.058***	-0.152***
		(0.022)		(0.022)	(0.047)
SP			0.023**	0.022**	
			(0.010)	(0.010)	
Size	0.124**	0.123**	0.119**	0.118**	0.231*

	(0.050)	(0.050)	(0.049)	(0.049)	(0.121)
Leverage	0.148	0.150	0.163	0.164	-0.618
	(0.183)	(0.183)	(0.183)	(0.182)	(0.376)
ROA	0.339	0.358	0.293	0.313	2.032***
	(0.312)	(0.312)	(0.313)	(0.312)	(0.707)
Duality	0.081*	0.079	0.082*	0.080	-0.049
	(0.049)	(0.049)	(0.049)	(0.049)	(0.116)
TobinQ	-0.016	-0.017	-0.014	-0.015	-0.090**
	(0.016)	(0.016)	(0.016)	(0.016)	(0.042)
SOE	-0.024	-0.024	-0.019	-0.020	-0.200
	(0.100)	(0.100)	(0.099)	(0.099)	(0.316)
Firmage	-0.093	-0.093	-0.087	-0.087	-0.266
	(0.148)	(0.148)	(0.147)	(0.147)	(0.353)
Constant	-1.829*	-1.777*	-1.736*	-1.689*	-3.906*
	(0.946)	(0.947)	(0.933)	(0.934)	(2.172)
Firm Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
R^2	0.133	0.134	0.135	0.136	0.013
F	19.890	19.091	19.123	18.374	1.865

5. Robustness test

To ensure the validity of the results, we conducted a series of robustness tests. First, we re-run our model using the tobit function in Stata 18, with a deletion limit of 0, because our dependent variable (Stata command: "xttobit y x1 x2... ll (0) "). The results are shown in Table 5 and are consistent with our main findings.

To test the robustness of the dependent variable, we changed the measurement method of the dependent variable. We used the citation count of the patent as a substitute indicator to measure the breakthrough level reflecting the enterprise's innovation. The breakthrough level (BI2) of enterprise innovation is the logarithm of the number of citations of all patents applied for by the enterprise within one year plus one. According to the results in Table 3 (1), by changing the measurement method of the breakthrough level of enterprise innovation, our results remain similar in terms of direction and support.

To test the robustness of the mediating variables, since Chinese listed companies do not disclose advertising expenses and R&D investment in detail, sales expenses and net intangible assets are often used as approximate substitutes in the study, making it difficult to truly reflect the enterprises' investment in advertising and R&D. Therefore, we added up the other four standardized indicators besides advertising expenses and R&D investment to obtain a new strategic continuity indicator (SP2) to test the robustness of the mediating effect. The Table 4 results indicate that the hypothetical conclusion remains robust.

6. Conclusions and Recommendations

Executive changes inhibit the breakthrough level of enterprise innovation by reducing strategic continuity. Our findings reveal a significant negative relationship between executive turnover and breakthrough innovation, suggesting that such changes affect innovation outcomes primarily through their impact on the continuity and focus of corporate strategy. Further analysis demonstrates that strategic continuity serves as a partial mediator in this relationship, offering a novel perspective on how leadership transitions shape innovation trajectories. These insights imply that when facing executive succession decisions, firms should carefully consider the potential disruption to their innovation strategies and take measures to preserve strategic stability while sustaining innovative momentum.

This study yields important practical implications. While conventional wisdom suggests that executive changes may introduce fresh perspectives and accelerate technological advancement, our theoretical and empirical analyses indicate that such transitions can hinder breakthrough innovations—those critical for sustaining competitive advantage and long-term success. Therefore, organizations should not rely solely on leadership replacement to generate radical innovation. Moreover, maintaining a clear and consistent strategic direction can serve as a buffer against the uncertainties and risks associated with executive turnover. By prioritizing strategic continuity during periods of management transition, firms can protect and enhance their long-term innovation capacity and market competitiveness.

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Table 3. Robustness tests for dependent variable.

	(1) BI2
Turnover	-0.08***
Firm Size	0.04
Leverage	0.45**
ROA	-0.81**
Duality	0.01
Tobin's Q	-0.07***
SOE	-0.04
Firm age	-0.08
Constant	0.17
Firm Fixed Effects	YES
Year Fixed Effects	YES
R^2	0.74
F	186.37

Table 4. Robustness Test of Mediating Effects.

	(1) BI	(2) BI	(3) BI	(4) BI	(5) SP2
Turnover	-0.061***		-0.058***		-0.125***
	(0.022)		(0.022)		(0.041)
SP2		0.030***	0.029***	0.030***	
		(0.011)	(0.011)	(0.010)	
Size	0.123**	0.118**	0.117**	0.118**	0.200*
	(0.050)	(0.049)	(0.049)	(0.049)	(0.110)
Leverage	0.150	0.164	0.165	0.156	-0.539*
	(0.183)	(0.183)	(0.183)	(0.183)	(0.324)
ROA	0.358	0.286	0.306	0.269	1.824***
	(0.312)	(0.312)	(0.312)	(0.313)	(0.609)
Duality	0.079	0.080	0.079	0.085*	0.020
	(0.049)	(0.049)	(0.049)	(0.049)	(0.097)
TobinQ	-0.017	-0.015	-0.016	-0.014	-0.038
	(0.016)	(0.016)	(0.016)	(0.016)	(0.035)
SOE	-0.024	-0.017	-0.017	-0.020	-0.238
	(0.100)	(0.098)	(0.099)	(0.098)	(0.271)
Firmage	-0.093	-0.093	-0.093	-0.086	-0.017
	(0.148)	(0.147)	(0.147)	(0.147)	(0.310)
Constant	-1.777*	-1.709*	-1.663*	-1.592*	-3.936**
	(0.947)	(0.934)	(0.936)	(0.935)	(1.947)
Firm Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
R^2	0.1338	0.1350	0.1361	0.1360	0.0120
F	19.091	19.344	18.542	17.608	1.966

Table 5. Robustness Test of tobit Model.

	(1) BI
Turnover	-0.114***
	(-3.247)
Size	0.170***
	(4.347)
Leverage	0.181
	(1.061)
ROA	0.626
	(1.640)
Duality	0.139**
	(2.481)
TobinQ	-0.011
	(-0.609)
SOE	-0.016
	(-0.147)
Constant	-5.879***
	(-5.545)
sigma_u	0.000
	(0.000)
sigma_e	0.985***
	(79.133)
N	6100