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How Policy Perception Drives Sustainable Innovation: The Mediating Role of Innovation Investment and Organizational Incentives

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Abstract. The significant impact of science and technology policies on corporate innovation performance has been widely recognized by scholars. However, some studies suggest that science and technology policies may have only moderate effectiveness or even no effect on corporate innovation development. Addressing the controversy over the effectiveness of science and technology policies, this study draws on innovation theory and agency theory to systematically explore the boundaries and underlying mechanisms of policy effectiveness. This study selected 443 high-tech enterprises in the Pearl River Delta region as the sample and employed structural equation modeling (SEM) to conduct empirical analysis of the hypothesized relationships. The results indicate that firms' perceptions of science and technology policies can significantly enhance innovation performance through innovation investment and organizational incentives, with the mediating effect of organizational incentives being particularly prominent. Additionally, innovation leadership plays a primary moderating role in the influence of policy perceptions on these mediating factors—when innovation leadership is at a lower level, the mediating effect of organizational incentives becomes insignificant. This finding clarifies the environmental boundary conditions for the effective operation of policies. This study provides important insights for relevant fields by revealing how policy cognition, organizational internal mechanisms, and leadership collectively shape sustainable innovation outcomes.

Keywords: science and technology innovation policy, innovation performance, innovation investment, organizational incentives, innovation leadership

1. Introduction

Science and technology policy, as an important policy tool for enhancing corporate innovation capabilities, has achieved significant results in corporate innovation practices around the world. Governments formulate science and technology policies with the aim of addressing issues related to the production, dissemination, and application of knowledge in the science and technology sector, including the mobilization and use of R&D funds, the allocation and guidance of social capital, and the transfer and commercialization of technology patents (Janssen et al., 2021). These policies not only provide direct economic support to enterprises, helping them overcome various obstacles in the innovation process to enhance their innovation performance, but also promote the flow of social capital and the aggregation of innovation resources to a certain extent (Song et al., 2024; Batuparan et al.,2025), thereby driving the overall innovation capacity of the economy.

However, there is significant disagreement in academic research regarding the effectiveness of science and technology policies. On the one hand, studies have found that science and technology policies can provide more resources for corporate innovation and signal government trust and support to the market, thereby addressing market failures caused by the leakage of innovative knowledge. Science and technology policies have a positive incentive effect on corporate innovation (Edler et al., 2023; Wennberg & Sandström, 2022). On the other hand, research has found that science and technology policies may crowd out firms' own innovation investments, thereby hindering autonomous innovation behaviour (Leong & Howlett, 2022; Montmartin et al., 2018). Due to insufficient coordination mechanisms and implementation biases during the policy formulation process, the implementation of science and technology policies often fails to achieve the expected outcomes and may even produce negative effects (Akcigit et al., 2021; Bahmanova & Lace, 2024). Some policies may lead to resource waste or deviation from policy objectives due to unclear implementation details. Science and technology policies may not only fail to assist enterprises in autonomous innovation but may even suppress their innovative capabilities (Leong & Howlett, 2022). Some studies also suggest that the positive incentive effects of science and technology policies are only effective within a specific scope. Exceeding this scope may trigger opportunistic behaviour among enterprises, leading to policy ineffectiveness or even counterproductive outcomes (Akcigit et al., 2021; Zhou & Pan , 2019)

Academic debates on the effectiveness of science and technology policies have preliminarily revealed that the promotional role of such policies in fostering corporate innovation is subject to specific conditions and boundary effects (Wennberg & Sandström, 2022). From the perspective of policy essence, the core objective of science and technology policy is to address market failures in the processes of knowledge production, diffusion, and application in the science and technology sector (Yu & Fang, 2023),This includes key dimensions such as support for research and development funding, guidance on the allocation of social capital, and the optimisation and reasonable pricing of innovative elements such as talent and technology (Anton-Tejon et al., 2024).

At the corporate innovation level, existing research indicates that outcomes are highly correlated with resource inputs and allocation efficiency(Busru & Shanmugasundaram, 2017; Chen et al., 2023; Wang et al., 2024). Innovation behaviour is essentially a process of re-combining various resource elements, and its outcomes depend on the synergistic effects of factors such as capital investment, human resource allocation, and internal incentive systems (Wang et al., 2024). Based on this, innovation investment and internal incentive systems are widely regarded as the core resource foundations for enterprises to enhance their innovation capabilities and improve innovation performance (Manzoor et al., 2023) Therefore, exploring the impact mechanisms of science and technology policies on these core resource elements has become an important pathway for evaluating the effectiveness of science and technology policies. Additionally, existing research has further found that leadership style plays a key role in integrating policy resources, stimulating team creativity, and formulating innovation strategies (Nadi et al., 2022). When corporate leaders lack strategic vision and innovation orientation, the role of policies cannot be fully utilised, and even in mismatched internal mechanisms or economic environments, there may be diminishing returns or even failure of the policy to take effect (Bodolica et al., 2020).

Based on the above background, this study aims to explore how corporate perceptions of policy promote corporate innovation performance through the integration of innovation resources, the stimulation of team creativity, and internal mechanisms of leadership style, and further analyse the conditions and boundary effects of science and technology policy on the effectiveness of corporate innovation.

2. Theoretical Framework and Hypotheses Development

2.1. Theoretical Framework

Innovation theory emphasises that innovation is the fundamental driving force behind corporate competitiveness and national economic growth. Schumpeter (1912) defined innovation as a process of ‘creative destruction’—whereby firms disrupt market equilibrium by introducing new products, technologies, or processes, thereby generating excess profits. Subsequent research further highlights that science and technology policies, as a crucial component of the external institutional environment, play a key role in this process (Dou, 2021; Yang et al., 2020; Hasnawati et al., 2024; Han & Ali, 2025;). Policies such as research and development (R&D) subsidies, tax incentives, and intellectual property protection can effectively stimulate innovation investment by alleviating firms’ financial constraints, reducing innovation risks, and strengthening the expected returns from technological activities, thereby fostering sustained R&D engagement and enhancing overall innovation performance (Song et al., 2024).

Especially in environments with high technological uncertainty, these policy tools not only alleviate firms' resource constraints but also reduce the risk of innovation failure, thereby enhancing firms' willingness to explore and invest in innovation (Bozeman & Sarewitz, 2011).

Within a company's internal governance structure, managers do not always prioritise the long-term interests of the company. Agency theory suggests that differences in objectives and information asymmetry between principals and agents may lead to moral hazard and adverse selection issues (Wang, 2024). In an innovative environment characterised by high costs, uncertainty, and delayed returns, agents (such as middle managers or project leaders) may exhibit risk-averse behaviour and avoid radical innovation. This phenomenon is particularly evident in short-term performance evaluation systems. Managers often prefer incremental improvements over breakthrough innovations, thereby weakening overall innovation momentum (Islam & Rahman, 2023). Additionally, innovation often disrupts existing organisational structures and interest distribution patterns, potentially triggering resistance or passive responses from senior managers, thereby exacerbating agency conflicts (Tang & Liu, 2024).

This study integrates innovation theory and agency theory to construct a comprehensive analytical framework aimed at exploring how science and technology policies influence corporate innovation performance through internal mechanisms. The framework identifies innovation investment and organisational incentive mechanisms as key mediating variables, revealing the causal pathways linking external policy perceptions to internal innovation outcomes. On the one hand, enhanced policy awareness prompts firms to optimise resource allocation by increasing R&D funding, talent, and technological investments (Dou, 2021). On the other hand, well-designed incentive mechanisms can mitigate agency problems, activate the innovative motivation of management and employees, and improve innovation implementation (An & Lasi, 2024). Additionally, innovation leadership is introduced as a moderating variable, which can facilitate strategic-level policy interpretation and foster an innovation culture, thereby further enhancing the impact of policies on innovation behaviour (Bodolica et al., 2020)，This comprehensive framework provides a clear empirical logic and offers actionable insights for policymakers and business managers.

2.2. The Relationship between Science and Technology Policy and Innovation Performance

Previous studies have demonstrated that science and technology (S&T) policies exert a significant positive impact on firms' innovation performance (Fan, 2017; Salomon, 1977).

These policies not only guide enterprises to enhance R&D investment and improve technological capabilities, but also optimize the allocation of innovation resources and stimulate technological vitality. Such findings provide a solid theoretical foundation and practical basis for the formulation and implementation of S&T policies, reinforcing their practical value in promoting innovation.

Most existing studies are conducted at the macro level, relying primarily on data from listed companies or public databases (Dou, 2021). These studies tend to focus on the overall effectiveness of policy instruments such as fiscal subsidies, tax incentives, and intellectual property protection, while overlooking the heterogeneity in how individual firms perceive and respond to policies. In reality, even under the same policy environment, firms often exhibit divergent innovation behaviors and performance outcomes (Jian et al., 2024). This suggests that firms' perceptions of policy may serve as a critical mediating variable influencing policy effectiveness (Xu et al., 2022).

As firms interpret, accept, and implement S&T policies, their subjective judgments are shaped by factors such as resource endowments, strategic orientations, and managerial cognition (Zhou et al., 2021) These perceptions not only determine the degree of attention given to specific policies, but also affect decision-making in areas such as resource allocation and strategic planning, ultimately influencing both innovation input and innovation performance (Jiang et al., 2022). Although the notion of policy perception has garnered increasing attention in the academic community, related studies remain limited in scope and analytical depth, and lack a systematic theoretical framework.

To address this gap, the present study adopts a firm-level perspective, focusing on the subjective perception of S&T policy. Drawing upon both innovation theory and policy perception theory, this study constructs a more comprehensive theoretical model to explore the internal mechanisms through which S&T policy influences firm innovation performance. This approach not only deepens the understanding of how firms perceive and respond to policy, but also provides practical implications for enhancing the effectiveness of policy implementation.

Accordingly, the following hypothesis is proposed:

H1: Science and technology policy is positively associated with firm innovation performance.

2.3. The relationship between innovation investment, science and technology policy, and innovation performance

A substantial body of research has demonstrated that science and technology policies can effectively address market failures caused by insufficient innovation incentives and limited resources within firms. These policies achieve this by alleviating innovation resource constraints, reducing marginal innovation costs, and mitigating innovation risks (Liu et al., 2024). Furthermore, S&T policies play a vital role in facilitating the efficient allocation of innovation resources by promoting the flow of capital, knowledge, and talent from governments, research institutions, and private investors into enterprises. This helps relieve firms' financing constraints (Ren et al., 2021), enhances the efficiency of resource allocation, and partially bridges the gap between private and social returns on innovation, thereby significantly strengthening firms' innovation motivation, investment behaviors, and performance outcomes (Lin & Wang, 2024).

Against this backdrop, innovation input is widely regarded as a critical resource foundation for firms to achieve technological breakthroughs and performance improvements. Empirical studies have shown that innovation input is positively associated with firms' technological innovation efficiency; the greater the investment intensity, the higher the quantity, quality, and market conversion capability of technological outputs (Wang et al., 2024). As such, innovation input serves not only as a key mediating variable linking S&T policies to innovation performance, but also as a strategic lever for promoting high-quality enterprise development (Kunpeng et al., 2023).

Within the analytical framework of how S&T policies influence firm-level innovation performance, innovation input is frequently conceptualized as a mediating pathway. However, existing studies tend to rely on single macro-level indicators—such as the ratio of R&D expenditure to operating revenue—to measure innovation input (Yu & Fang, 2023). While such metrics offer operational simplicity and comparability, they often fail to capture the multidimensional and layered nature of actual innovation activities within firms, thus overlooking important factors such as human capital investment, technological infrastructure upgrades, and collaborative innovation practices.

Building upon prior research, this study expands the conceptual and measurement dimensions of innovation input. It proposes a more comprehensive assessment framework that includes actual R&D funding, updates to technological equipment and software systems, the number and qualification of R&D personnel, and the extent of technical collaboration with external partners. By incorporating these more practical and context-sensitive indicators, the study seeks to more accurately reveal the guiding mechanisms through which S&T policies influence firms' innovation behavior.

Based on the above analysis, the following research hypotheses are proposed:

H2: S&T policies are positively associated with innovation input;

H3: Innovation input is positively associated with innovation performance;

H4: Innovation input mediates the relationship between S&T policies and firms' innovation performance.

2.4. The Relationship between Organisational Incentives, Science and Technology Policy, and Innovation Performance

Previous research has paid considerable attention to the impact of organizational incentives on enterprise innovation performance (Aoun et al., 2024). However, within the research framework examining how science and technology (S&T) policies influence innovation performance, the mediating role of organizational incentives has been relatively overlooked. Existing studies have primarily focused on macro-level factors—such as policy environment, financial support, or leadership behavior—and their direct effects on innovation performance, while relatively little attention has been given to how internal incentive mechanisms may function as a bridge between policy perception and innovation outcomes (Yang et al., 2020). Therefore, building upon prior research, this study incorporates organizational incentives into the analytical framework as a mediating variable. Along with innovation input, it constructs a dual mediation pathway to systematically explore the internal mechanisms through which S&T policies affect innovation performance.

The effective implementation of S&T policies relies on several core elements—policy supply, organizational leadership, innovation drive, and resource agglomeration—which jointly facilitate the efficient transformation of scientific and technological achievements (Aoun et al., 2024). In this process, the embedding of multi-level incentive mechanisms, particularly at the organizational level—such as task allocation, performance appraisal, and reward systems—can effectively motivate members and improve organizational operational efficiency (Ma & Rui, 2020) . Under policy guidance, enterprises can mitigate risks stemming from resource misallocation and reduce moral hazard by optimizing internal division of labor and adopting rational competitive strategies (Wang & Chen, 2024). Meanwhile, the market mechanisms stimulated by policy interventions can further enhance organizational performance and environmental adaptability, thereby improving the survival capacity and innovation potential of small and medium-sized enterprises (Pan & Deng, 2021).

From the perspective of principal–agent theory, organizational incentives are not only crucial tools in human resource management but also essential governance mechanisms for mitigating internal agency conflicts and reducing opportunistic behavior (Li, 2021). As external incentives, S&T policies are typically issued by government or supervisory bodies acting as principals, while enterprises, acting as agents, are responsible for translating policy goals into internal actions. In this process, innovation input primarily addresses issues of resource availability, whereas organizational incentives focus on resolving problems related to implementation willingness and agency deviation (Yang et al., 2020). By enhancing incentive structures, enterprises can reduce information asymmetry, improve accountability, and increase the motivation of both managers and employees, thereby improving the effectiveness and consistency of policy implementation.

It is worth noting that although both innovation input and organizational incentives function as mediating variables, they differ in their mechanisms and theoretical foundations, while exhibiting a degree of complementarity. Innovation input represents an external resource allocation mechanism, emphasizing tangible investments—such as R&D funding, technological equipment, human capital, and cooperation channels—that directly support innovation output (Pan et al., 2022). In contrast, organizational incentives reflect internal governance optimization, which indirectly influences innovation performance by motivating individual behavior and strengthening organizational cohesion. These differences suggest that the two mediating pathways may exhibit synergistic, substitutive, or mutually reinforcing effects in the process by which S&T policies affect enterprise innovation (Ma & Rui, 2020). Therefore, this study conducts a comparative empirical analysis of the effect sizes, mechanistic differences, and potential interactions between the two mediators, aiming to uncover the multi-dimensional impact pathways of S&T policies at the organizational level.

Based on the above theoretical foundations and research gaps, the following hypotheses are proposed:

H5: Science and technology policies are positively correlated with organizational incentives;

H6: Organizational incentives are positively correlated with enterprise innovation performance;

H7: Organizational incentives mediate the relationship between science and technology policies and enterprise innovation performance.

2.5. The moderating relationship of innovative leadership

Prior research has extensively examined the impact of leadership styles on firm-level innovation behaviors, indicating that leadership plays a critical role in motivating employees, fostering organizational change, and enhancing innovation capacity (Shen et al., 2024). Among various leadership styles, innovative leadership is particularly regarded as a key driver of corporate innovation, due to its advantages in facilitating cross-functional collaboration, integrating resources, and promoting knowledge sharing (Aman-Ullah et al., 2022). Studies have shown that innovative leadership can not only enhance product innovation performance through supporting R&D teams and optimizing organizational processes, but also moderate the relationship between individual employee capabilities and overall organizational innovation performance (Jing, 2024).

However, most existing studies tend to focus on the direct effects of leadership on isolated stages of innovation, such as employee behavior or innovation output, and have largely overlooked its broader moderating function within the macro-policy context (Huo & Li, 2023). In particular, the moderating role of leadership within the framework of science and technology policy—a key external driver of enterprise innovation—has received limited attention. Furthermore, the effectiveness of policy implementation is often constrained by various internal managerial factors, including organizational culture, incentive mechanisms, and leadership style (Chen, 2023). Nevertheless, empirical studies exploring how leadership styles may interact with policy tools to improve firms' responsiveness to policy and stimulate innovation performance remain scarce (Cortes & Herrmann, 2021). This research gap not only limits our understanding of the boundary conditions of policy effectiveness, but also weakens the actual impact of science and technology policy at the organizational level.

In light of these gaps, this study introduces innovative leadership as a moderating variable to explore its potential role in shaping the mechanism through which science and technology policy influences firm innovation outcomes. On the one hand, innovative leaders foster cross-departmental cooperation and implement human resource practices that support and incentivize R&D teams, thereby facilitating higher-level collaborative innovation across functional units (Worapongpat et al., 2024). On the other hand, by integrating internal and external resources, mediating interdepartmental relationships, and optimizing knowledge sharing mechanisms, innovative leadership enhances organizational adaptability to policy orientation and responsiveness to external incentives (Comtet & Johannessen, 2021). These processes may in turn strengthen the effectiveness of policy implementation and elevate firm-level innovation performance.

Based on the above theoretical framework, this study proposes the following research hypotheses:

H8: Innovative leadership moderates the relationship between science and technology policy and innovation input.

H9: Innovative leadership moderates the relationship between science and technology policy and organizational incentives.

H10: Innovative leadership moderates the relationship between science and technology policy and enterprise innovation performance.

2.6. Research model

Combining innovation theory and agency theory, this paper reviews relevant literature and constructs an analytical framework with science and technology policies as the independent variable, innovation investment and organizational incentives as the mediating variables, and corporate innovation performance as the dependent variable. The model also introduces innovation leadership as a moderating variable to explore its moderating role in the impact of science and technology policies on corporate internal innovation mechanisms. This design aligns with innovation theory's focus on leadership behavior and resource allocation, as well as agency theory's core propositions regarding organizational incentive mechanisms， as shown in Figure 1. Through this integrated model, this study can deeply explore how science and technology policies can ultimately enhance enterprise innovation performance through the guidance of innovative leaders and the optimization of intermediary mechanisms.

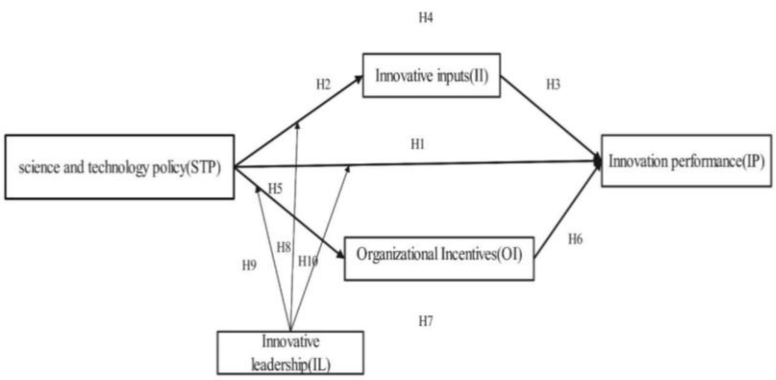

Fig.1: Hypotheses and research model

3.Reseach Methodology

3.1. Instrument Development

To ensure the reliability and validity of the measurement tool, this study developed a structured questionnaire based on established and validated scales from prior research. The questionnaire consists of 54 items in total, covering five core constructs relevant to the research model.

The first section of the questionnaire collects basic demographic and organizational information through six items. These items capture key characteristics of the respondents and their firms, including the respondent's position, industry type, firm ownership, and company size. This information facilitates the examination of sample representativeness and enables subgroup analysis.

The second section contains 48 items, with the measurement of each core variable drawing on established scales: the scale for perceived science and technology policies, referencing the studies by Yang Shixin (2020) and Wu Jing (2018), categorizes science and technology policies into five dimensions based on the intensity of firms' policy perception, namely Financial Policy (FTP), Tax Policy (TP), Talent Policy (TPP), Technology Policy (TP), and Intellectual Property Policy (IPP), encompassing 22 items in total; the scale for innovation input, adapted from Barasa (2019), consists of 6 items; the scale for organizational incentives, referencing Ma Xifang (2020), includes 5 items; the scale for innovation performance, based on Yang Shixin (2020), comprises 4 items; and the scale for innovative leadership, drawing on Bao Jingfeng (2024), contains 6 items. All items are rated using a 7-point Likert scale (1 = "Strongly Disagree," 7 = "Strongly Agree") to enable a nuanced assessment of respondents' attitudes, perceptions, and evaluations.

The structured design of the instrument, grounded in existing literature and tested scales, contributes to the methodological rigor of the study. By ensuring internal consistency and content validity, the questionnaire provides a reliable foundation for the subsequent empirical analysis and structural model testing.

3.2. Data Collection and Sample

This study employed a combination of deductive research and questionnaire surveys. Questionnaires were distributed to the heads of R&D departments of enterprises in the Pearl River Delta region that have been recognised as national high-tech enterprises, and data was collected using convenience sampling. The survey was conducted from February to April 2025 using a combination of online and offline methods. The online survey was conducted via an electronic questionnaire platform, while paper questionnaires were distributed through offline channels such as industry conferences and company recommendations to ensure sample representativeness and data quality. A total of 552 questionnaires were collected. After rigorous screening, 109 invalid questionnaires were excluded, resulting in 443 valid responses, with an effective response rate of 80.3%. The screening criteria for invalid questionnaires included abnormal response times, missing key items, logical contradictions, and selecting the same answer for all questions.

3.3. Data Analysis

This study utilised statistical software such as SPSS 26.0 and AMOS 26.0 for data analysis, testing the reliability and validity of the questionnaire. Descriptive statistical analysis, correlation analysis, structural equation modelling (SEM), and other methods were employed to reveal the relationships between variables, validate the research hypotheses, and achieve the research objectives.

4. Results

4.1. Descriptive Statistical Analysis

This study conducted descriptive statistical analysis on the main variables. The results showed that the mean values of all variables were around 5 points, with standard deviations ranging from 1.16 to 1.50. This indicates that respondents scored relatively high across all variable dimensions, with some internal variability within the sample. Among these, the mean value for Innovative Leadership (IL) was the highest (M = 5.22), reflecting that enterprises exhibit a stronger tendency toward innovative leadership styles; the standard deviation for Science and Technology Policy Perception (STP) was the smallest (SD = 1.16), indicating that this variable exhibited minimal variability across the sample.

Additionally, the skewness of all variables was negative, ranging from –0.18 to –0.64, indicating that the overall distribution of the variables was slightly left-skewed, with higher scores concentrated in the lower end, suggesting a positive evaluation bias. The kurtosis values range from –0.58 to –1.25, with all variables exhibiting negative kurtosis, indicating that their distributions are slightly flatter than a normal distribution. Overall, the variable distributions generally meet the requirements for normality, making them suitable for subsequent correlation analysis and structural equation modelling.

Table 1. Descriptive analysis of core variables

Variable	N	Mean	Std. Deviation	Skewness	Kurtosis
ETP	443	5.14	1.45	-0.56	-0.73
II	443	5.15	1.46	-0.62	-0.69
OI	443	5.18	1.42	-0.54	-0.80
IP	443	5.07	1.50	-0.49	-0.94
IL	443	5.22	1.37	-0.58	-0.66

4.2. Validity and Reliability Testing

As shown in Table 2, the overall Cronbach's alpha coefficient of the scale is 0.967, and the values of each measurement dimension of this scale range from 0.852 to 0.932, with Cronbach's alpha > 0.8. Therefore, it can be concluded that the internal consistency of the questionnaire is very good, and its reliability is very high, with the content reliability of each measurement indicator meeting acceptable or higher standards.

This study conducted confirmatory factor analysis on the scale, with all factor loadings ranging from 0.749 to 0.944, indicating a strong correlation between the items and their underlying factors. The cumulative variance explained reached 80.433%, indicating that the extracted factors effectively captured most of the information contained in the observed variables. The composite reliability (CR) exceeded 0.87, and the average variance extracted (AVE) was greater than 0.65. Additionally, the square root of the AVE for each construct was higher than the inter-construct correlation coefficient. These measurement indicators suggest that the scale has good convergent validity and discriminant validity.

Table 2. Internal consistency reliability analysis of each scale

Variable	Cronbach's Alpha	CR	AVE
ETP	0.967	0.895	0.680
II	0.895	0.933	0.697
OI	0.932	0.922	0.701
IP	0.903	0.903	0.699
IL	0.852	0.924	0.671

4.3. Common Method Bias Test

This study used the most frequently used Harman single-factor test to test for common method bias. The results showed that the initial variance explained by the maximum factor was 42.797%, which was less than 50%. Therefore, there was no serious common method bias in this study.

4.4. Correlation Analysis

As shown in Table 3， the results of the correlation analysis indicate that all variables are significantly correlated at the P < 0.01 level, with correlation coefficients ranging from 0.536 to 0.608. This suggests moderate to moderately strong positive relationships among the variables, supporting the feasibility of further analysis using Structural Equation Modeling (SEM).

Table 3. Correlation analysis

	STP	II	OI	IP	IL
STP	1				
II	.578**	1			
OI	.608**	.580**	1		
IP	.576**	.586**	.600**	1	
IL	.585**	.536**	.623**	.596**	1

*Note：*** Correlation is significant at the 0.001 level (2-tailed).** Correlation is significant at the 0.01 level (2-tailed).* Correlation is significant at the 0.05 level (2-tailed).*

4.5. Structural Equation Modelling Analysis

The structural model in this study fits well overall. The CMIN/DF value is 1.366 (<5), and the SRMR is 0.040 (<0.08), indicating that the model residuals are acceptable. GFI (0.912) and AGFI (0.899) are both close to the recommended threshold of 0.90. Other key indicators—NFI (0.936), IFI (0.967), TLI (0.962), and CFI (0.967)—all exceed 0.90, further confirming the model's good performance. The RMSEA value is 0.029 (< 0.08), further supporting the model's fit and providing a solid foundation for subsequent path analysis.

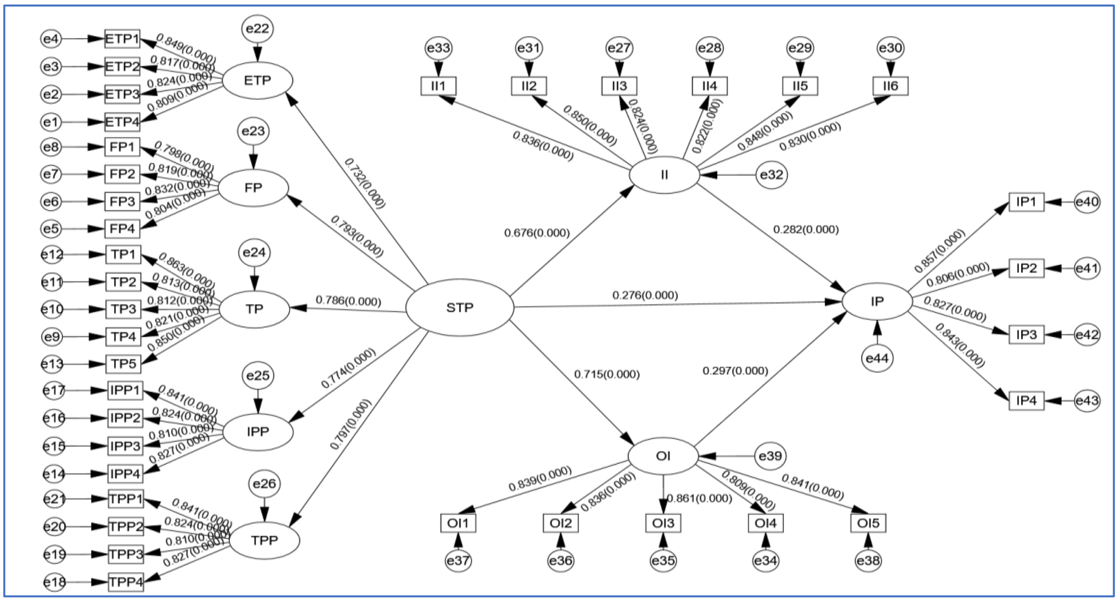

Fig.2: Structural equation modelling diagram.

As shown in Table 4, science and technology policy (STP) has a significant positive effect on innovation performance (IP) (β = 0.276, t = 3.448, p < 0.001), supporting H1. STP also positively affects innovation inputs (II) (β = 0.676, t = 10.855, p < 0.001) and organisational incentives (OI) (β = 0.715, t = 11.147, p < 0.001), confirming H2 and H5.

Both II and OI significantly contribute to IP (β = 0.282, t = 4.944, p < 0.001; β = 0.297, t = 4.816, p < 0.001), supporting H3 and H6.

These results indicate that STP enhances innovation performance both directly and indirectly through II and OI, validating the proposed model structure.

Table 4. Latent variable path coefficients

hypothesis	Path	B	β	SE	t-value	p-value	Hypothesis Supported
H1	STP→IP	0.397	0.276	0.115	3.448	***	Yes
H2	STP→II	0.950	0.676	0.088	10.855	***	Yes
H3	II→IP	0.288	0.282	0.058	4.944	***	Yes
H5	STP→OI	0.948	0.715	0.085	11.147	***	Yes
H6	OI→IP	0.322	0.297	0.067	4.816	***	Yes

*Note:*** Correlation is significant at the 0.001 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).* Correlation is significant at the 0.05 level (2-tailed).*

As shown in Table 5, the direct effect of STP on IP was significant (β = 0.276, 95% CI [0.131, 0.442]), accounting for 40.65% of the total effect. The indirect effect via II was 0.191 (95% CI [0.101, 0.281]), and via OI was 0.213 (95% CI [0.118, 0.301]), accounting for 28.13% and 31.37% of the total effect, respectively. As all confidence intervals excluded zero, both II and OI showed significant partial mediation effects, supporting H4 and H7.

Table 5. Mediating effect analysis

Path	Effect type	Effect	β	SE	BootLLCI	BootULCI	Relative effect
STP→TP	Total	0.976	0.679	0.033	0.609	0.740	100.00%
STP→TP	Direct	0.397	0.276	0.078	0.131	0.442	40.65%
STP→II→TP	Indirect	0.274	0.191	0.046	0.101	0.281	28.13%
STP→OI→TP	Indirect	0.305	0.213	0.047	0.118	0.301	31.37%

4.6. Moderating Effect Test

Bootstrapping (5,000 samples) was used to assess the moderating effects. Results show that the interaction term STP × IL has a significant positive effect on II (β = 0.1121, t = 2.985, p < 0.01) and on OI (β = 0.1988, t = 6.045, p < 0.001), indicating that IL positively moderates the relationships between STP and both II and OI, supporting H8 and H9. However, the moderating effect on IP is not significant (β = 0.0575, t = 1.570, p > 0.05), thus H10 is not supported.

Table 6 Testing the moderated mediation model

hypothesis	Dependent variable	Independent variable	coeff	se	t	p	LLCI	ULCI	R-sq	F	Hypothesis Supported
H8	II	STP*IL	0.112	0.038	2.985	0.003	0.038	0.186	0.412	50.921	Yes
H9	OI	STP*IL	0.199	0.033	6.045	0.000	0.134	0.263	0.722	79.327	Yes
H10	IP	STP*IL	0.058	0.037	1.570	0.117	-0.015	0.130	0.513	57.130	No

*Note: STP*IL is the interaction term between STP and IL.*

Simple slope analysis showed that at low levels of IL (M − SD), STP significantly predicted II (slope = 0.330, t = 4.037, p < 0.01); at high IL levels (M + SD), the predictive effect was stronger (slope = 0.636, t = 8.778, p < 0.001), supporting H8. The corresponding indirect effects of STP on IP via II were significant at both low (effect = 0.077, 95% CI [0.027, 0.145]) and high IL levels (effect = 0.149, 95% CI [0.078, 0.231]).

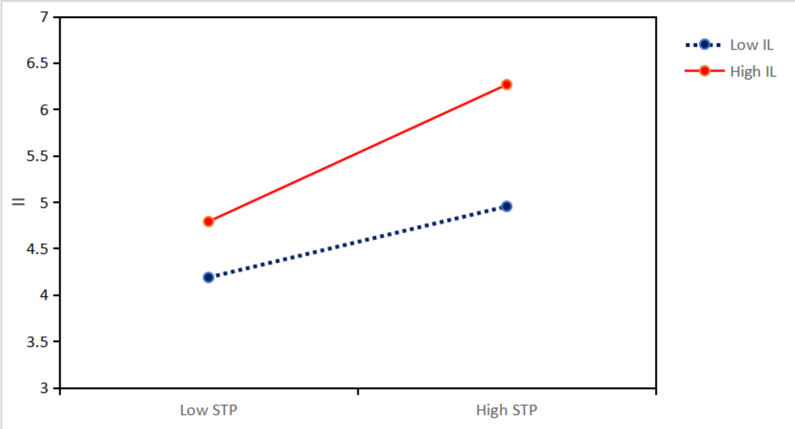

Fig.3: Simple Slope Plot.

Similarly, STP significantly predicted OI at low IL (slope = 0.141, t = 1.975, $p < 0.05$) and more strongly at high IL (slope = 0.685, t = 10.785, $p < 0.001$), supporting H9. The indirect effect via OI was not significant under low IL (effect = 0.029, 95% CI [−0.0004, 0.068]) but was significant at high IL (effect = 0.140, 95% CI [0.061, 0.226]).

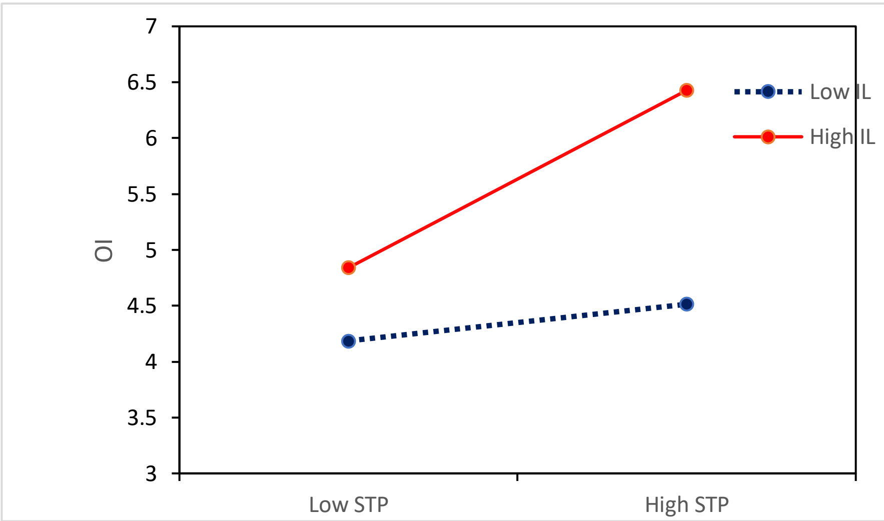

Fig.4: Simple slope diagram

Overall, IL significantly moderates the indirect effects of STP on IP via II and OI, enhancing the transmission of policy influence under high-level innovative leadership. However, IL does not significantly moderate the direct path from STP to IP, and H10 is not supported.

5. Conclusions and Discussion

Under the premise that enterprises have a positive perception of science and technology policies, they are not only more inclined to increase R&D resource investments but are also more likely to stimulate employees' innovative momentum through optimising internal incentive mechanisms (Pan & Deng, 2021). Managers' perceptions of science and technology policies are not only the cognitive starting point for enterprise innovation responses but also effectively promote the realisation of innovation performance through two pathways: resource allocation and organisational support, providing empirical support for understanding the mechanism of science and technology policy effects.

Innovation investment plays a significant mediating role between perceptions of science and technology policies and corporate innovation performance. This finding suggests that when corporate managers actively perceive the supportive orientation of science and technology policies, they will correspondingly increase resource allocation in areas such as R&D funding, technical equipment, and talent recruitment, thereby creating conditions for subsequent innovation output and enhancing the likelihood of realising innovation outcomes (Afrifa et al., 2020).This study found that while this mediating pathway is significant, its effect strength is relatively lower than that of organisational incentives, Innovation investment is merely one of the conditions, and its incentive efficacy still requires support from internal management mechanisms and cultural atmosphere to be fully realised.

Organisational incentives play a significant mediating role between perceptions of science and technology policies and innovation performance, with their effect strength surpassing that of innovation investments. This finding underscores that, in the process of enterprises responding to external policies, it is more critical to optimise internal systems and adjust incentive mechanisms to stimulate the innovative potential of organisational members, thereby achieving a deep transformation of policy effects, rather than merely increasing resource allocation.

From the perspective of agency theory, innovation inherently carries a certain degree of risk, particularly for management acting as agents of the firm. Innovation often involves uncertainty, long-term investments, and the possibility of failure (Antón et al., 2023). Management may prioritise decisions with more certain short-term returns for their own interests, rather than investing in innovative projects that require long-term investment and carry higher risks (Li, 2021). This tendency to prioritise short-term interests can be seen as a manifestation of agency issues, especially when management decisions may not fully align with the best interests of shareholders or the company's long-term development. At this point, organisational incentive mechanisms, as institutional safeguards, can effectively mediate such agency conflicts, prompting management to align personal interests with the company's long-term goals, alleviate concerns about innovation failures, and encourage them to invest resources and effort into achieving long-term innovation outcomes (Ma et al., 2018). When companies perceive the positive orientation of science and technology policies, if they can simultaneously establish clear incentive orientations, reasonable authorisation mechanisms, and positive feedback systems, they can internalise policy signals into employees' goal alignment and behavioural responses, thereby fostering synergy within the organisation to facilitate the smooth implementation and high-quality outcomes of innovation activities.

Regarding the moderating effect, innovative leadership has a significant positive moderating effect on the relationship between science and technology policies and innovation investment, as well as between science and technology policies and organisational incentives. This indicates that in companies with higher levels of innovative leadership, the promotional effect of policy awareness on internal innovation mechanisms is more pronounced. Further analysis reveals that when innovation leadership is low, the mediating effect of science and technology policies on innovation performance through organisational incentives is not significant. When managers lack a firm belief in the value of innovation, even with policy-supported incentive mechanisms, they may tend to reduce innovation investments and avoid innovation risks under short-term pressure for benefits, leading to incentive resources being redirected toward routine operations. In such cases, the incentive effects of science and technology policies are gradually eroded, ultimately failing to exert a substantial impact on innovation performance. This highlights the critical role of innovation leadership in policy implementation. Without this core element, the transmission chain between policy and performance experiences structural breakdowns. Therefore, innovation leadership not only strengthens the intensity of the mediating pathway but also serves as the key moderating condition for transforming policy awareness into innovation performance.

The study also found that innovative leadership styles did not have a significant moderating effect on the direct path between perceptions of science and technology policies and innovation performance.

This result suggests that the primary influence mechanism is concentrated at the process variable level, specifically the initial investment in innovation activities and the organisational preparation phase, rather than direct intervention in the final outcome. The generation of performance involves multiple factors such as external market feedback, product maturity, and commercialisation pathways, and the influence of leadership style is more likely to be indirect and gradual (Persada & Nabella, 2023). This finding further suggests that the influence of leadership behaviour on policy outcomes follows an 'indirect' rather than a "direct" pathway, highlighting its bridging role between 'policy perception' and 'organisational response.' Practically speaking, this implies that a high-quality science and technology policy environment can only maximise its effectiveness in a management context characterised by supportive leadership styles; otherwise, even with clear policy direction, effectiveness may diminish due to insufficient internal organisational transmission mechanisms.

6. Management Implications

6.1 Implications for Corporate Management Practices

Managers should regard policy perception capabilities as a core component of corporate strategic adaptability and establish a regular mechanism for interpreting and responding to science and technology policies to ensure that external policy signals are quickly transmitted to internal strategic planning, resource allocation, and incentive system design, thereby shortening the response time and transmission distance between policies and actions.

When allocating innovation resources under policy guidance, companies should shift their focus from merely 'how much to invest' to 'the effectiveness of investments.' Blindly increasing R&D funding is not the only way to improve innovation performance; the key lies in precise resource allocation. Companies should prioritise R&D in core technologies and the commercialisation of short-chain research outcomes, ensuring that innovation resources are concentrated in areas with the greatest potential and market prospects. Additionally, it is recommended to strengthen cross-departmental collaboration and technological integration to avoid resource dispersion, thereby enhancing the precision of resource allocation and the return on innovation investments. By optimising the structure of innovation investments, companies can not only improve resource utilisation efficiency but also accelerate the conversion process from R&D to market, thereby enhancing overall innovation output efficiency and competitiveness.

In the process of policy implementation, organisational incentives have had a more significant effect than innovation investment, indicating that companies should place greater emphasis on supporting and guiding innovative behaviour at the institutional level. To improve innovation performance, companies should strengthen the development of incentive mechanisms, such as authorisation, promotion, training, and recognition. These incentives not only promote the improvement of employee skills but also enhance their sense of responsibility and belonging, stimulating their long-term creativity and willingness to work collaboratively. Additionally, companies should establish incentive mechanisms centred on trust and growth to encourage employees to innovate spontaneously and collaborate as a team. By restructuring incentive mechanisms, companies can effectively enhance employees' intrinsic motivation, driving improvements in the organisation's overall innovation capabilities and competitive advantages.

Companies should promote a shift in leadership styles from control-oriented to support-oriented, particularly among middle and senior management, by fostering open, exploratory, and error-tolerant leadership behaviours. Innovative leadership not only enhances an organisation's ability to absorb and implement science and technology policies but also provides crucial support for the effective implementation of incentive mechanisms and precise resource allocation. By advocating supportive leadership behaviours, companies can create an environment that encourages innovation and risk-taking, helping employees better leverage their creativity under policy guidance to drive organisational sustainable development and competitiveness. Innovative leadership is a key force in achieving the successful alignment of corporate strategy and policy.

6.2 Implications for Government Policy Making

This study shows that whether science and technology policies can produce performance effects depends not only on the strength of the policies themselves, but more importantly on whether enterprises can effectively embed incentive systems and management mechanisms into the policy implementation process to achieve policy ‘absorption and transformation.’ Therefore, policy makers should consider the internal operational logic of enterprises, especially the interface with incentive systems and leadership mechanisms, when designing policies to ensure that they can be smoothly implemented within enterprises. By enhancing the policy's executability and organisational adaptability, the policy will better stimulate the enterprise's innovative potential and drive performance improvements.

In terms of the perceived strength of policies, talent policies are perceived as stronger than technology policies, which are stronger than intellectual property policies, which are stronger than financial policies, which are stronger than fiscal and tax policies. This ranking reflects the different policy areas that enterprises prioritise in their innovation processes, with talent policies having the most significant impact on driving enterprise innovation momentum. Understanding this hierarchical structure helps policymakers design and implement relevant policies with precision, thereby enhancing the influence and effectiveness of policies.

Therefore, it is recommended that governments at all levels establish a more precise science and technology policy service system, providing differentiated policy packages and supporting measures tailored to the different development stages of enterprises. Additionally, it is recommended to pilot a ‘direct access mechanism’ for policies in innovation clusters such as science and technology parks and high-tech zones, simplifying the process of obtaining policies, reducing the barriers and costs for enterprises to access policy resources, and improving the reach of policies and the sense of benefit for enterprises. Through this transformation, the government can more effectively provide targeted and practical policy support to enterprises, driving their rapid growth and innovative development.

7. Conclusion

This study develops a theoretical model linking science and technology policy perception, innovation input, organizational incentives, innovative leadership, and innovation performance. Empirical testing through structural equation modeling and moderated mediation analysis yields valuable insights. Nonetheless, several limitations should be addressed in future research.

First, the sample focuses on high-tech enterprises in China, with limited industry, firm size, and regional diversity. This may constrain the generalizability of the findings. Future studies should expand the sample across sectors and regions to improve external validity.

Second, the cross-sectional design limits the ability to infer causality and track dynamic policy effects. Longitudinal studies, field experiments, or quasi-experimental methods are recommended to capture policy evolution and firm behavior over time.

Third, the model does not fully consider contextual moderators such as environmental dynamism, firm life cycle, or regional policy enforcement intensity. Incorporating these factors using multilevel modeling could strengthen explanatory power and deepen understanding of policy effectiveness.

Fourth, the study relies mainly on quantitative analysis, lacking qualitative insights into internal policy interpretation and innovation mechanisms. Future research could integrate interviews or case studies to explore managerial perceptions, communication practices, and leadership behaviors more deeply.

Lastly, while innovative leadership is identified as a key moderator, its internal dimensions and behavioral patterns warrant further examination. Exploring how different leadership styles influence policy implementation could provide practical guidance for leadership development in innovation contexts.

In conclusion, future research should diversify samples, extend timeframes, consider broader contextual variables, and adopt mixed methods to enrich theory and inform practice. These efforts will enhance the understanding of how science and technology policies translate into firm-level innovation outcomes.

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Reference

Afrifa, G. A., Tingbani, I., Yamoah, F., & Appiah, G. (2020). Innovation input, governance and climate change: Evidence from emerging countries. *Technological Forecasting and Social Change*, *161*, 120256. https://www.sciencedirect.com/science/article/pii/S0040162520310829

Akcigit, U., Hanley, D., & Serrano-Velarde, N. (2021). Back to basics: Basic research spillovers, innovation policy, and growth. *The Review of Economic Studies*, *88*(1), 1–43. https://academic.oup.com/restud/article-abstract/88/1/1/5922649

Aman-Ullah, A., Mehmood, W., Amin, S., & Abbas, Y. A. (2022). Human capital and organizational performance: A moderation study through innovative leadership. *Journal of Innovation & Knowledge*, *7*(4), 100261. https://www.sciencedirect.com/science/article/pii/S2444569X22000968

An, J., & Lasi, M. A. (2024). Research on Corporate Innovation and Compensation Incentives. *Financial Economics Insights*. https://doi.org/10.70088/e5w9w562

Antón, M., Ederer, F., Giné, M., & Schmalz, M. (2023). Common Ownership, Competition, and Top Management Incentives. *Journal of Political Economy*, *131*(5), 1294–1355. https://doi.org/10.1086/722414

Anton-Tejon, M., Barge-Gil, A., Martinez, C., & Albahari, A. (2024). Science and technology parks and their heterogeneous effect on firm innovation. *Journal of Engineering and Technology Management*. https://doi.org/10.1016/j.jengtecman.2024.101820

Aoun, A., Adda, M., Ilinca, A., Ghandour, M., & Ibrahim, H. (2024). Comparison between Blockchain P2P Energy Trading and Conventional Incentive Mechanisms for Distributed Energy Resources—A Rural Microgrid Use Case Study. *Applied Sciences*, *14*(17), 7618. https://doi.org/10.3390/app14177618

Bahmanova, A. & Lace, N. (2024). The High Stakes of Cyber Resilience: What Key Business Assets Can SMEs Afford to Lose? *Journal of Service, Innovation and Sustainable Development*, 5(1), 12-29. https://doi.org/10.33168/SISD.2024.0102.

Batuparan, D.S.; Wahyuni S.& Sudhartio, L. (2025). Business Model Innovation and Digitalization in SME Internationalization: The Mediating Role of Internationalization Process. *Journal of Logistics, Informatics and Service Science*, 12(4), 18-37. 10.33168/JLISS.2025.0402.

Bodolica, V., Spraggon, M., & Saleh, N. (2020). Innovative leadership in leisure and entertainment industry: The case of the UAE as a global tourism hub. *International Journal of Islamic and Middle Eastern Finance and Management*, *13*(2), 323–337. https://doi.org/10.1108/IMEFM-12-2019-0521

Bozeman, B., & Sarewitz, D. (2011). Public Value Mapping and Science Policy Evaluation. *Minerva*, *49*(1), 1–23. https://doi.org/10.1007/s11024-011-9161-7

Busru, S., & Shanmugasundaram, G. (2017). Effects of Innovation Investment on Profitability and Moderating Role of Corporate Governance: Empirical Study of Indian Listed Firms. *Indian Journal of Corporate Governance*, *10*, 117–197. https://doi.org/10.1177/0974686217730938

Chen, W. (2023). Research on the Mechanism and Path of Innovation Policy Driving Enterprise Technological Innovation. *Frontiers in Science and Engineering*, *3*(5), 58–69. https://doi.org/10.54691/fse.v3i5.5021

Chen, Y., Fang, Y., & Jia, Z. (2023). Analysis of the time dynamics of science and technology achievement transformation policies under the policy mix perspective. *China Science and Technology Forum, 3*, 26–36, 48. https://doi.org/10.13580/j.cnki.fstc.2023.03.017

Comtet, H. E., & Johannessen, K.-A. (2021). The moderating role of pro-innovative leadership and gender as an enabler for future drone transports in healthcare systems. *International Journal of Environmental Research and Public Health*, *18*(5), Article 5. https://www.mdpi.com/1660-4601/18/5/2637

Cortes, A. F., & Herrmann, P. (2021). Strategic Leadership of Innovation: A Framework for Future Research. *International Journal of Management Reviews*, *23*(2), 224–243. https://doi.org/10.1111/ijmr.12246

Dou, S. (2021). *A study of the impact of S&T policy mix on firms' innovation performance* [PhD Thesis, Central University of Finance and Economics, Beijing]. https://doi.org/10.27665/d.cnki.gzcju.2021.000040

Edler, J., Blind, K., Kroll, H., & Schubert, T. (2023). Technology sovereignty as an emerging frame for innovation policy. Defining rationales, ends and means. *Research Policy*, *52*(6), 104765. https://www.sciencedirect.com/science/article/pii/S0048733323000495

Fan, C. (2017). Knowledge components and systems in science and technology policy. *scientific research*, *35*(2), 161–169, 254. https://doi.org/10.16192/j.cnki.1003-2053.2017.02.001

Han, N.; Ali M. H. (2025). An Empirical Study on the Dynamic Impact of the Value Co-Creation Model on Business Model Innovation within a Digital-Driven Business Ecosystem. *Journal of Logistics, Informatics and Service Science*, 12(2), 311-324. https://doi.org/10.33168/JLISS.2025.0219

Hasnawati, Kusumaningtyas, A. & Cempena, I.B. (2024). Ambidextrous Leadership, Customer Orientation, Environmental Innovation Through Digital Capability and Technological Capability: The Influence of Moderation of Service Innovation Capability. *Journal of Logistics, Informatics and Service Science*, 11(11), 502-518. https://doi.org/10.33168/JLISS.2024.1127.

Huo, M., & Li, C. (2023). Impact of managerial power on enterprise innovation performance: The mediating roles of financing constraints and strategic orientation. *Chinese Management Studies*, *17*(3), 637–659. https://doi.org/10.1108/CMS-06-2021-0249

Islam, E., & Rahman, L. (2023). Shades of grey: Risk-related agency conflicts and corporate innovation. *Journal of Corporate Finance*. https://doi.org/10.1016/j.jcorpfin.2023.102475

Janssen, M. J., Torrens, J., Wesseling, J. H., & Wanzenböck, I. (2021). The promises and premises of mission-oriented innovation policy—A reflection and ways forward. *Science and Public Policy*, *48*(3), 438–444. https://academic.oup.com/spp/article-abstract/48/3/438/6298315

Jian, Z., Javaid, M., & Liao, S. (2024). Strategic orientation, strategic flexibility and firm performance: The important role of strategic human resource management. *Chinese Management Studies*. https://doi.org/10.1108/cms-02-2024-0112

Jiang, H., Yang, J., & Liu, W. (2022). Innovation ecosystem stability and enterprise innovation performance: The mediating effect of knowledge acquisition. *Journal of Knowledge Management*, *26*(11), 378–400. https://www.emerald.com/insight/content/doi/10.1108/JKM-04-2022-0275/full/html

Jing, B. (2024). *Progress and Prospects of Innovative Leadership Research*. Journal of Chongqing Gongshang University. 10.3969/j.issn.1672-0598.2024.02.007

Kunpeng, S. U. N., Ting, L. U. O., & Xing, X. (2023). Talent Policy, R&D Personnel Recruitment and Corporate Innovation. *Frontiers of Business Research in China*, *17*(2), Article 2. https://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=16737326&AN=173132884&h=03pupK9iBRXqdNG1DMu7NS1Klf7nUaHqFPdIPesPM%2FrAGk6irbQS0W356eDmUdNBeaXjkM42t4xvqXD0M9CLMA%3D%3D&crl=c

Leong, C., & Howlett, M. (2022). Policy Learning, Policy Failure, and the Mitigation of Policy Risks: Re-Thinking the Lessons of Policy Success and Failure. *Administration & Society*, *54*(7), 1379–1401. https://doi.org/10.1177/00953997211065344

Li, P. (2021). Organisational incentive dilemmas, fair games and incentive synergies in a dual principal-agent framework. *leadership science*, *10*, 73–76. https://doi.org/10.19572/j.cnki.ldkx.2021.10.019

Lin, S. & Wang, Z. (2024). Measuring the Effectiveness of Technological Innovation Policies and Evaluating the Implementation Effectiveness of Chinese Enterprises. *Southeast Academic*, *1*, 151–164. https://doi.org/10.13658/j.cnki.sar.20240002.001

Liu, D., Li, X., Shi, H., & Chen, Z. (2024). Advancing nuanced pollution control: Local improvements and spatial spillovers of policies on key enterprises. *Journal of Environmental Management*, *356*, 120533. https://doi.org/10.1016/j.jenvman.2024.120533

Ma Xi Fang, Jong Kwan-yuen, & Yan Shifu. (2018). A study of the mechanisms by which organisational motivation and leadership styles synergistically affect organisational creativity. *Management Commentary*, *30*(8), 153–167. https://doi.org/10.14120/j.cnki.cn11-5057/f.2018.08.013

Ma Xi Fang & Rui Zhengyun. (2020). A Review of the Frontiers of Motivation and a Perspective on Motivational Synergy Research—A Multidisciplinary/School, Multilevel, Multidimensional Perspective. *Science and Science and Technology Management*, *41*(6), 143–158. https://kns.cnki.net/KCMS/detail/detail.aspx?dbcode=CJFQ&dbname=CJFDLAST2020&filename=KXXG202006009

Manzoor, F., Wei, L., Subhan, Q. A., & Siraj, M. (2023). Sustainability-oriented innovation system and economic stability of the innovative countries. *Frontiers in Public Health*, *11*, 1138034. https://doi.org/10.3389/fpubh.2023.1138034

Montmartin, B., Herrera, M., & Massard, N. (2018). The impact of the French policy mix on business R&D: How geography matters. *Research Policy*, *47*(10), 2010–2027. https://www.sciencedirect.com/science/article/pii/S0048733318301744

Nadi, M. A., Haghshenas, Z., & Khorsandi, E. (2022). The Role of Knowledge-oriented Leadership in Knowledge Management Practices and Innovation. *Educational and Scholastic Studies*, *11*(3), 266–241. https://pma.cfu.ac.ir/mobile/article_2519_ebc1f820020f90c10b2691acb9cc61b4.pdf

Pan, W., Xie, T., Wang, Z., & Ma, L. (2022). Digital economy: An innovation driver for total factor productivity. *Journal of Business Research*, *139*, 303–311. https://www.sciencedirect.com/science/article/pii/S0148296321007128

Pan, Y., & Deng, X. (2021). Incentive Mechanism Design for Distributed Autonomous Organizations Based on the Mutual Insurance Scenario. *Complexity*, *2021*(1), 9947360. https://doi.org/10.1155/2021/9947360

Persada, I. N., & Nabella, S. D. (2023). The influence of leadership, motivation and incentives on the performance of personnel of the operations section of Polda Kepri. *International Journal of Accounting,* *Management, Economics and Social Sciences (IJAMESC)*, *1*(4), 403–416. http://ijamesc.com/index.php/go/article/view/38

Ren Shuming, Zhang Wan Ying, Li Lianqing, & Liu Dan. (2021). The Impact of Monetary Policy Uncertainty on Firm Innovation—Mediating Effects Based on the Level of Firm Risk Taking. *Contemporary Economic Studies*, *8*, 101–112. https://kns.cnki.net/KCMS/detail/detail.aspx?dbcode=CJFQ&dbname=CJFDLAST2021&filename=DDJJ202108010

Salomon, J.-J. (1977). Science policy studies and the development of science policy. *Science, Technology and Society*, 43–70. https://cir.nii.ac.jp/crid/1572261550567199488

Shen, H., Xiong, P., Yang, L., & Zhou, L. (2024). Quantitative evaluation of science and technology financial policies based on the PMC-AE index model: A case study of China's science and technology financial policies since the 13th five-year plan. *PLOS ONE*, *19*(8), e0307529. https://doi.org/10.1371/journal.pone.0307529

Song, Z.; Xu, G.; & Jiao, B. (2024). Can a new national system policy for science and technology promote industrial restructuring in China's national innovation center cities? *Soft Computing*. https://doi.org/10.1007/s00500-023-09537-3

Tang, J. & Liu, Q. (2024). R&D Tax Incentive Policy, Intellectual Property Right Protection, and Corporate Innovation in an Emerging Market. *Research in International Business and Finance*. https://doi.org/10.1016/j.ribaf.2024.102244

Wang, H. (2024). Information Asymmetry and Agency Problems in the Financial Market. *Highlights in Business, Economics and Management*. https://doi.org/10.54097/2eq3j535

Wang, H. & Chen, N. (2024). An empirical study of executive research backgrounds on enterprise innovation-the moderator of internal and external institutional environments on physics-reason-human methodology. *International Review of Economics & Finance*, *93*, 140–151. https://www.sciencedirect.com/science/article/pii/S1059056024002417

Wang, X.; Chen, Y.; & Zhao, M. (2024). Research on the Combined Effect of Scientific and Technological Achievement Transformation Policies in China's Provincial Areas. *scientific research*, *42*(9), 1864–1876. https://doi.org/10.16192/j.cnki.1003-2053.20230919.001

Wennberg, K., & Sandström, C. (2022). *Questioning the entrepreneurial state: Status-quo, pitfalls, and the need for credible innovation policy*. Springer Nature. https://library.oapen.org/handle/20.500.12657/54427

Worapongpat, N., Wongkumchai, T., & Anuwatpreecha, T. (2024). Innovative Leadership of Educational Institution Administrators at Dhonburi Rajabhat University. *Journal of Education and Learning Reviews*, *1*(2), 1–12. https://so19.tci-thaijo.org/index.php/JELS/article/view/675

Wu, J. & Ger, B. (2023). Influencing Factors and Path Selection of Science and Technology Innovation Policy Implementation—A Qualitative Comparative Analysis of Fuzzy Sets Based on 109 Cases. *Research and development management*, *35*(3), 151–162. https://doi.org/10.13581/j.cnki.rdm.20220244

Xu, L., Wen, T., & Wang, J. (2022). How does job insecurity cause unethical pro-organizational behavior? The mediating role of impression management motivation and the moderating role of organizational identification. *Frontiers in Psychology*, *13*, 941650. https://www.frontiersin.org/articles/10.3389/fpsyg.2022.941650/full

Yang, S.; Liu, W.; Han, H.; & Liu, Y. (2020). Study on the Incentive Effect of Science and Technology Policies on Enterprise Innovation—Based on Empirical Evidence from Ethnic Minority Regions. *Scientific management studies*, *38*(6), 94–101. https://doi.org/10.19445/j.cnki.15-1103/g3.2020.06.014

Yu, Y. & Fang, S. (2023). Science and technology policy, enterprise innovation and innovation decision-making. *Science and Science and Technology Management*, *44*(7), 75–90. https://kns.cnki.net/KCMS/detail/detail.aspx?dbcode=CJFQ&dbname=CJFDLAST2023&filename=KXXG202307006

Zhou, B.; Li, Y.; Sun, F. & Zhou, Z. (2021). Executive compensation incentives, risk level and corporate innovation. *Emerging Markets Review*, *47*, 100798. https://www.sciencedirect.com/science/article/pii/S1566014121000066

Zhou, Y. & Pan, Y. (2019). Fiscal Subsidies and Tax Breaks: Analysis of New Energy Vehicle Industry Policies from the Perspective of Transaction Costs. *Managing the World*, *35*(10), 133–149. https://doi.org/10.19744/j.cnki.11-1235/f.2019.0137