Evaluation of Intellectual Property Commercialization Policies Under a Four-Dimensional Analytical Framework: Quantitative Analysis Based on Policy Texts (Postprint)

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Abstract

[Purpose/Significance]By establishing an evaluation system for intellectual property transformation policies, this study provides a reference basis for government departments to formulate scientific and reasonable intellectual property transformation policies, thereby promoting the development of national intellectual property. [Method/Process] Based on content analysis and coding of intellectual property transformation policies, a four-dimensional analytical framework was established to determine the evaluation index system for intellectual property transformation policies. The policy quantification standard and entropy-weighted TOPSIS model were employed to measure and evaluate six selected intellectual property transformation policies. [Results/Conclusion] Among the evaluation indicators of intellectual property transformation policies, the weights of policy intensity, policy instruments, policy objectives, and policy target objects show relatively small gaps; the policy objectives evaluation indicator exerts the greatest influence on the evaluation of intellectual property transformation policies, while the policy instruments evaluation indicator exerts the least influence. The comprehensive ranking results of the six policies indicate that “Several Opinions of the Ministry of Education, the National Intellectual Property Administration, and the Ministry of Science and Technology on Improving Patent Quality in Higher Education Institutions and Promoting Transformation and Application” ranks relatively high, whereas “Notice on Implementing the Patent Transformation Special Plan to Assist the Innovative Development of Small and Medium-sized Enterprises” and “Notice of the General Office of the Ministry of Education on Conducting Special Inspections on the Implementation of Scientific and Technological Achievement Transformation Policies” rank relatively low. Finally, based on the research results, the limitations of the study are identified and corresponding policy recommendations are

proposed.

Full Text

Preamble

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Research on the Evaluation of Intellectual Property Transformation Policies under a Four-Dimensional Analytical Framework: A Quantitative Analysis Based on Policy Texts

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Abstract

[**Purpose/Significance**] This study establishes an evaluation system for intellectual property (IP) transformation policies to provide a reference basis for government departments in formulating scientific and reasonable IP transformation policies, thereby promoting national IP development. [**Method/Process**] Based on content analysis and coding of IP transformation policies, a four-dimensional analytical framework is constructed to determine the evaluation index system for IP transformation policies. Using policy quantification standards and an entropy-weighted TOPSIS model, six selected IP transformation policies are measured and evaluated. [**Results/Conclusions**] The findings indicate that among the evaluation indicators for IP transformation policies, the weight differences among policy intensity, policy tools, policy objectives, and policy target objects are relatively small. The policy objective evaluation indicator has the greatest impact on IP transformation policy evaluation, while the policy tool evaluation indicator has the least impact. The comprehensive ranking results of the six policies show that *Opinions of the Ministry of Education, the China National Intellectual Property Administration, and the Ministry of Science and Technology on Improving the Quality of Patents in Higher Education Institutions and Promoting Their Transformation and Application* ranks relatively high, while *Notice on Implementing the Special Plan for Patent Transformation to Support the Innovative Development of Small and Medium-sized Enterprises* and *Notice of the General Office of the Ministry of Education on Conducting Special Supervision on the Implementation of Policies for the Transformation of Scientific and Technological Achievements* rank relatively low. Finally, based on the research findings, the limitations of the study are identified and corresponding policy recommendations are proposed.

Keywords: Intellectual property transformation policy; Policy evaluation; Pol-

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Introduction

Intellectual property transformation is the process of converting existing creative intellectual achievements into real productive forces. The *National Intellectual Property Protection and Utilization Plan for the 14th Five-Year Plan* explicitly proposes to "improve the effectiveness of IP transfer and transformation to support the innovative development of the real economy." The *Proposal of the Central Committee of the Communist Party of China on Formulating the 14th Five-Year Plan for National Economic and Social Development and the Long-Range Objectives Through the Year 2035* adopted at the Fifth Plenary Session of the 19th CPC Central Committee emphasizes "strengthening IP protection and substantially improving the effectiveness of the transfer and transformation of scientific and technological achievements." As the final link in the entire chain of economic development, IP transformation holds significant meaning and function.

Existing research on IP transformation primarily includes evaluation of transformation capacity [**?**], countermeasure research for transfer and transformation [**?**], and evaluation index systems [**?**, **?**]. Analysis of current research reveals that studies focusing on quantitative evaluation of IP transformation policy texts are relatively scarce. This paper proposes a four-dimensional analytical framework model for evaluating IP transformation policies based on content analysis and coding of policy texts, examining policy intensity, policy tools, policy objectives, and policy target objects. This framework is used to evaluate and analyze existing IP transformation policies, identify their deficiencies, and provide reference basis for subsequent policy adjustments and formulation.

1. Research Methods

The entropy-weighted TOPSIS method combines information entropy and TOPSIS. Information entropy is commonly applied in comprehensive evaluation to determine indicator weights by comprehensively considering the information provided by each indicator, thereby largely overcoming subjective factors. The core idea of TOPSIS is to calculate the distances between solutions and the ideal optimal and worst solutions, then compute the relative closeness of each solution to the ideal solution for ranking [**?**]. Combining these two methods makes the evaluation more objective and the policy evaluation results more convincing.

The basic evaluation steps are as follows:
(1) Use the improved entropy method to assign weights to evaluation indicators,

obtaining the original matrix X = (xij) m*n, where xij represents the value of the j-th indicator for the i-th evaluation unit.
(2) Normalize the original matrix using the range standardization method, as shown in formula (1).

$$X_{ij} =$$

(3) Calculate characteristic values as shown in formula (2).

$$f_{ij} =$$

(4) Entropy calculation is shown in formula (3).

(5) Weight calculation is shown in formula (4).

$$m(\sum_{i} w_j =$$

(6) The positive ideal solution S_j^+ is calculated as shown in formula (5), and the negative ideal solution S_j^- is calculated as shown in formula (6).

$$\{1, 2, 3, ..., \}$$

(7) The Euclidean distance to the positive ideal solution D_i^+ is calculated as shown in formula (7), and the Euclidean distance to the negative ideal solution D_i^- is calculated as shown in formula (8).

(8) The relative closeness of each evaluation unit to the ideal solution is shown in formula (9).

Based on the closeness degree, the evaluation units are ranked. Higher values indicate better ranking.

2.1 Policy Text Selection and Determination

This study retrieved policy texts from official IP policy platforms including the Chinese Government website, PKULaw, and the China National Intellectual Property Administration. Search terms included “intellectual property,” “intellectual property transformation,” and “scientific and technological achievement transformation” in titles, with the time range limited to January 2008 to August 2023. The retrieval date was September 2, 2023. To ensure representativeness and authority of policy text content, the selection criteria were: first, select national-level policy texts issued by the Central Committee of the CPC, the State Council, and their directly affiliated institutions; second, select policy

texts closely related to "intellectual property transformation"; third, select policy texts of types such as opinions, work guidelines, and plans; fourth, policy texts must be currently effective. Through screening and organization, 40 policy documents were obtained.

Six national-level IP transformation policies were selected as evaluation objects, with the policy list shown in Table 1 .

Table 1 Six National-Level Intellectual Property Transformation Policy Texts

Code	Policy Title	Year
T1	*Measures of the Ministry of Transport for Promoting the Transformation of Scientific and Technological Achievements*	2021
T2	*Notice of the General Office of the Ministry of Education, the General Office of the China National Intellectual Property Administration, and the General Office of the Ministry of Science and Technology on Organizing and Implementing the "Hundred Universities, Thousand Items" High-Value Patent Cultivation and Transformation Action*	2022
T3	*Notice on Implementing the Special Plan for Patent Transformation to Support the Innovative Development of Small and Medium-sized Enterprises*	2021
T4	*Opinions of the Ministry of Education, the China National Intellectual Property Administration, and the Ministry of Science and Technology on Improving the Quality of Patents in Higher Education Institutions and Promoting Their Transformation and Application*	2020
T5	*Notice of the General Office of the Ministry of Science and Technology on Accelerating the Construction and Development of National Demonstration Zones for the Transfer and Transformation of Scientific and Technological Achievements*	2020

Code	Policy Title	Year
T6	*Notice of the General Office of the Ministry of Education on Conducting Special Supervision on the Implementation of Policies for the Transformation of Scientific and Technological Achievements*	2018

2.2 Construction of the Policy Quantitative Analysis Framework

The term "policy analysis" was first proposed by American scholar Harold Lasswell in 1943, opening a new path for the development of contemporary policy analysis theory. In the policy analysis system, policy quantitative research is an important component that has been widely applied in public policy research both domestically and internationally. In China, this method is used for empirical research on policies in various fields [**?**]. For example, He Jixin et al. [**?**] explored the supply characteristics and logic of blockchain policies and proposed future development directions for China's blockchain policies; Chen Zhangwang et al. [**?**] used quantitative statistical methods to analyze the effectiveness, objectives, and tools of central and local maker space policies, and compared similarities and differences between Chinese and foreign innovation and entrepreneurship industrial policies; Liu Guojia et al. [**?**] established a three-dimensional analysis framework based on policy texts issued by the central government from January to August 2020 in response to the COVID-19 pandemic, using social network analysis, content analysis, and PMC index models to deeply explore the subject cooperation network, response content, and response effects; Li Hao et al. [**?**] used content and quantitative analysis methods to construct a three-dimensional framework based on policy objectives, policy tools, and policy intensity to conduct multi-dimensional classification and cross-comparison analysis of national-level DRG policy items.

The above studies demonstrate that scholars emphasize the establishment of various evaluation models to supplement and improve research conclusions when conducting quantitative analysis of policy texts in various fields. Existing evaluation models primarily focus on three dimensions, mainly concentrating on "policy objectives, policy tools, policy intensity." In addition to these three dimensions, the focus of policy research also includes policy target objects. Therefore, based on policy quantitative analysis and combined with the overall characteristics of IP transformation policies, this paper constructs a four-dimensional model of policy intensity, policy tools, policy objectives, and policy target objects, attempting to identify problems in current policies and provide corresponding optimization suggestions.

2.2.1 Policy Intensity

Policy intensity refers to the degree of credibility and enforceability demonstrated by policy subjects when formulating policies. Policy intensity directly affects the influence and binding force on policy objects—the higher the level of the issuing institution, the stronger the policy implementation intensity. IP transformation and utilization are important factors in promoting economic development, and their transformation degree is inseparable from government support. By setting the indicator of policy intensity, we can evaluate the effectiveness of IP transformation policies and examine the government's emphasis on IP transformation.

2.2.2 Policy Tools

Policy tools are measures used by policymakers and implementers that can potentially be employed to achieve one or more policy objectives. As a bridge connecting policy subjects and objects, policy tools are of great significance in promoting the development of policy objects. Therefore, selecting a reasonable classification method for policy tools is a key link in evaluating policy content [**?**]. Researchers typically adopt Rothwell's classification method, dividing policy tools into supply-oriented, demand-oriented, and environment-oriented types—a widely used classification approach that demonstrates certain authority [**?**]. When conducting content analysis of IP transformation policies, we found that policy content involves technical support, talent cultivation, capital investment, target planning, strategic measures, public services, international cooperation, and other policy tools. Therefore, this paper classifies policy tools into three categories: supply-oriented, environment-oriented, and demand-oriented.

2.2.3 Policy Objectives

Policy objectives are not only prerequisites for policy implementation but also fundamental conditions for policy execution [**?**]. Therefore, this paper includes policy objectives as an evaluation indicator for IP transformation policies, dividing IP transformation policy objectives into four aspects: intellectual property, independent innovation, market service system, and talent cultivation.

2.2.4 Policy Target Objects

The target objects of IP transformation policies refer to the groups to which these policies are applied. Various entities—including government agencies, enterprises, universities, research institutions, and other organizations—play crucial yet distinct roles in the process of IP transformation and utilization, and all are indispensable. Therefore, it is necessary to include the indicator of policy target objects in the analytical framework.

2.3 Content Encoding of Intellectual Property Creation Policy Texts

This study imported the collected 40 IP creation policy texts into NVivo qualitative analysis software. Through encoding analysis of policy text content units (as shown in Table 2), we can obtain core content of policy text analysis units under different dimensions, providing reference basis for subsequent establishment of policy indicator quantification standards. The encoding results are transformed into visualized data to describe partial characteristics of policy texts.

Table 2 Intellectual Property Transformation Policy Content Analysis Units

Policy Content Analysis Unit	Example
Notice of the General Office of the State Council on Forwarding Several Policies of the National Development and Reform Commission and Other Departments on Promoting the Industrialization of Independent Innovation Achievements	(3) Effectively implement tax support policies for promoting the industrialization of independent innovation achievements. Encourage enterprises to increase R&D investment in the industrialization of independent innovation achievements. For R&D expenses on new technologies, new products, and new processes, additional deductions are allowed when calculating taxable income in accordance with relevant tax laws and policies… (5) Encourage higher education institutions and research institutions to transfer independent innovation achievements to enterprises… Improve technology transfer mechanisms, and actively promote the transfer and licensing of independent innovation achievements…

Policy Content Analysis Unit	Example

2.3.1 Encoding Process

This paper follows the principle of "policy number - chapter number - analysis unit" for encoding to ensure each policy analysis unit has a unique and independent code that can be quickly verified during subsequent text analysis. For example, for the policy *Opinions of the Ministry of Education, the China National Intellectual Property Administration, and the Ministry of Science and Technology on Improving the Quality of Patents in Higher Education Institutions and Promoting Their Transformation and Application* (coded as policy 16), the statement "select several universities to carry out the cultivation of professional IP operation or technology transfer talent teams, continuously improving universities' IP operation and technology transfer capabilities…" in "Chapter 3, Article 2" is encoded as "16-3-2." If the same analysis unit involves other subcategories under the same dimension, it is encoded repeatedly.

2.3.2 Encoding Classification

After completing all encoding, the codes need to be classified into various subcategories around the four-dimensional analytical framework to facilitate quantitative statistics and content analysis. Encoding examples are shown in Table 3 .

Table 3 Policy Text Encoding Examples

Analysis Unit Content	Policy Intensity	Policy Tools	Target Objects	Policy Objectives
Opinions of the Ministry of Education, the China National Intellectual Property Administration, and the Ministry of Science and Technology on Improving the Quality of Patents in Higher Education Institutions and Promoting Their Transformation and Application: "Select several universities to carry out the cultivation of professional IP operation or technology transfer talent teams, continuously improving universities' IP operation and technology transfer capabilities…"	Ministry of Education, China National Intellectual Property Administration	Supply-oriented (talent cultivation, technical support)	Talent cultivation and introduction; core technology and…	

2.4 Evaluation Index System

Based on the policy dimension classification framework, this paper establishes a three-level policy evaluation system from four dimensions: policy intensity, policy objectives, policy tools, and policy target objects, totaling 14 indicators, as shown in Table 4 .

Table 4 Intellectual Property Transformation Policy Evaluation Index System

Primary Indicator	Secondary Indicator	Tertiary Indicator
Policy Intensity	Issuing Level	Laws issued by the National People's Congress and its Standing Committee
		Regulations, plans, decisions, and interim regulations issued by the State Council
		Regulations, provisions, guidelines, and plans issued by various ministries
		Opinions, measures, and interim provisions issued by various ministries
	Synergy	2 or more issuing bodies
		1 issuing body
Policy Tools	Supply-oriented	Legal aid, information services, facility construction, technical support, talent cultivation, capital investment
	Environment-oriented	Strategic measures, regulatory supervision, financial services, target planning
	Demand-oriented	Public services, international cooperation, government-enterprise cooperation, policy subsidies, overseas institutions

Primary Indicator	Secondary Indicator	Tertiary Indicator
Policy Objectives	Intellectual Property	Emphasize the importance of IP transformation and utilization, improve transformation capabilities
	Independent Innovation	Enhance national and enterprise independent innovation levels, establish innovation systems
	Market Service System	Improve market-oriented IP transaction service systems, promote economic value creation
	Talent Cultivation	Encourage professional talent cultivation, implement talent plans
Policy Target Objects	Government Agencies Enterprises Universities Research Institutions Other Organizations	

2.5 Policy Index Quantification Standards

Policy quantification essentially involves scoring relevant indicators according to certain standards. To better study IP transformation policies, drawing on Zhang Yong'an's [**?**] approach to measuring technological innovation policies and combining policy text mining methods with policy text encoding results, this paper refines the assignment of policy texts from four dimensions: policy intensity, policy objectives, policy tools, and policy target objects. To ensure scientific measurement, three experts engaged in information policy and legal research were consulted to establish scoring standards for each IP transformation policy, resulting in quantification standards shown in Tables 5 through 8 .

Table 5 Policy Intensity

Score	Standard
5	Laws issued by the National People's Congress and its Standing Committee
4	Regulations, plans, decisions, and interim regulations issued by the State Council
3	Regulations, provisions, guidelines, and plans issued by various ministries
2	Opinions, measures, and interim provisions issued by various ministries
1	2 or more issuing bodies
0	1 issuing body

Policy intensity refers to the credibility and enforceability demonstrated by the government when formulating laws and regulations, which directly affects the influence and binding force on policy implementation objects. Therefore, the higher the level of the issuing institution and the greater the number of issuing bodies, the higher the policy's authority and implementation intensity. Policy implementation intensity has two aspects: issuing level and synergy degree [**?**]. The higher the issuing level and the greater the number of issuing bodies, the higher the score. A synergy degree of 0 indicates one issuing body, while a synergy degree of 1 indicates two or more issuing bodies.

Table 6 Policy Tools

Score	Supply-oriented	Environment-oriented	Demand-oriented
5	Detailed, clear, and comprehensive provisions and measures for legal aid, information services, facility construction, technical support, talent cultivation, capital investment	Detailed, clear, and comprehensive provisions and measures for strategic measures, regulatory supervision, financial services, target planning	Detailed, clear, and comprehensive provisions and measures for public services, international cooperation, government-enterprise cooperation, policy subsidies, overseas institutions
4	Relatively comprehensive provisions and measures	Relatively comprehensive provisions and measures	Relatively comprehensive provisions and measures
3	Certain measures provided	Certain measures provided	Certain measures provided

Score	Supply-oriented	Environment-oriented	Demand-oriented
2	Mentioned but no specific measures proposed	Mentioned but no specific measures proposed	Mentioned but no specific measures proposed
1	Only mentioned, no specific measures involved	Only mentioned, no specific measures involved	Only mentioned, no specific measures involved

Policy tool indicators include three dimensions: supply-oriented, demand-oriented, and environment-oriented. This classification has been applied to quantitative research on China's talent introduction policies, wind energy policies, information service policies, etc. Supply-oriented policy tools refer to the government's direct expansion of supply through support for talent, technology, capital, etc., directly promoting national IP development through improved supply elements, mainly manifested as legal aid, information services, facility construction, technical support, talent cultivation, and capital investment. The purpose of these tools is primarily to ensure the smooth progress of IP work with relatively obvious effects. Environment-oriented policy tools refer to the government creating favorable environments for IP through relevant policies, indirectly promoting IP work, specifically manifested as financial finance, target planning, strategic measures, and financial taxation. Demand-oriented policy tools refer to the government's efforts to improve the current situation of imperfect IP infrastructure and stabilize IP work, mainly manifested as public services, international cooperation, government-enterprise cooperation, policy subsidies, and overseas institutions.

Table 7 Policy Objectives

Score	Intellectual Property	Independent Innovation	Market Service System	Talent Cultivation
5	Emphasizes the importance of IP transformation and utilization from a legislative perspective	Advocates independent innovation and establishes innovation systems	Highly values further improvement of market-oriented IP transaction service systems, establishes legal systems, reduces approval processes	Strongly encourages cultivation of professional IP transfer talent, implements talent plans

Score	Intellectual Property	Independent Innovation	Market Service System	Talent Cultivation
4	Clearly proposes IP transformation and utilization with detailed regulations for various industries	Increases investment from financial and other departments, formulates national independent innovation plans	Values further improvement of market-oriented IP transaction service systems with relatively fewer approval restrictions	Encourages talent cultivation with relatively high preferences
3	Values IP transformation and proposes specific measures	Strengthens introduction, absorption, and transformation of innovation, increases economic investment, formulates targeted independent innovation	Values further improvement of market-oriented IP transaction service systems with preferential support in taxation and other aspects	Encourages talent cultivation with partial preferences but relatively strict administrative procedures
2	Mentions IP transformation but proposes no specific measures	Mentions independent innovation and provides departmental policy preferences	Values further improvement of market-oriented IP transaction service systems but no specific optimization measures	Encourages talent cultivation with small support and strict administrative procedures
1	Only involves IP transformation	Only involves independent innovation	Only involves improvement and optimization of market-oriented IP transaction service systems	Only involves talent cultivation

Policy objectives are primarily described from four aspects: intellectual property, independent innovation, market service system, and talent cultivation. The purpose of IP transformation policies is mainly to improve the transfer and transformation effectiveness of enterprises, universities, and research institutes, supporting the innovative development of the real economy. IP objectives

emphasize the importance of IP transformation and utilization, improving the transfer and transformation capabilities of enterprises, universities, and research institutes, and promoting the application of major scientific and technological achievements. Independent innovation objectives refer to enhancing national and enterprise independent innovation levels, establishing independent innovation achievement systems, and achieving domestic substitution. Market service system objectives refer to valuing the further improvement of market-oriented IP transaction service systems, flourishing scientific and technological innovation and entrepreneurship, and promoting enterprises to create economic value. Talent cultivation objectives refer to encouraging professional talent cultivation, implementing talent plans, thereby achieving professional IP transfer and transformation and promoting the growth of talent teams.

Table 8 Policy Target Objects

Target Object	Score
Government Agencies	1 (if involved), 0 (if not involved)
Enterprises	1 (if involved), 0 (if not involved)
Universities	1 (if involved), 0 (if not involved)
Research Institutions	1 (if involved), 0 (if not involved)
Other Organizations	1 (if involved), 0 (if not involved)

Policy target objects include government agencies, enterprises, universities, research institutions, and other organizations. If the policy involves government agencies, enterprises, universities, research institutions, or other service organizations, it scores 1; otherwise, it scores 0.

2.6 Reliability and Validity Testing

2.6.1 Reliability Testing

Generally, when the Cronbach's α value is greater than 0.700, the factor is considered to have good reliability; higher coefficients indicate better reliability. Using SPSS software to verify the four dimensions established in this paper, the results are shown in Table 9 .

Table 9 Reliability Testing Results of the Scale

Dimension	Cronbach's α Value
Policy Intensity	0.772
Policy Tools	0.705
Policy Objectives	0.934
Policy Target Objects	0.902

As shown in Table 9, the Cronbach's α values for policy intensity, policy tools, policy objectives, and policy target objects are 0.772, 0.705, 0.934, and 0.902 respectively, all passing the reliability test and indicating that the indicator design of the policy scale is reasonable.

2.6.2 Validity Testing

Validity testing measures the effective degree of policy indicators. Validity testing includes content validity testing and structural validity testing. Content validity testing generally uses expert analysis to examine the content of quantification indicators. Structural validity testing uses KMO and Bartlett's spherical test to examine the effectiveness of relationships among relevant indicators and test the effectiveness of the evaluation model. The KMO measure value of the policy scale is 0.739, and in Bartlett's spherical test, $P < 0.01$, indicating that the selected indicators are suitable for factor analysis.

3.1 Weight Determination

According to the entropy weight method principle, calculations were performed on the 14 evaluation indicators of the six policies using formulas (1) through (5). The entropy weight results for primary indicators are shown in Table 10 .

Table 10 Entropy Weights of Policy Evaluation Indicators

Primary Indicator	Weight wj
Policy Intensity	0.249
Policy Tools	0.182
Policy Objectives	0.309
Policy Target Objects	0.261

As shown in Table 10, the weights of policy intensity, policy tools, policy objectives, and policy target objects are 0.249, 0.182, 0.309, and 0.261 respectively, with relatively small gaps among the indicator weights. The policy objective evaluation indicator has the greatest impact on IP transformation policy evaluation, while the policy tool evaluation indicator has the least impact.

3.2 Comprehensive Ranking Results

According to the TOPSIS evaluation principle, calculations were performed using formulas (6) through (9) to obtain the relative closeness values of each policy text, i.e., the comprehensive evaluation values of policy texts, with results shown in Table 11 .

Table 11 Comprehensive Evaluation Values of Six Intellectual Property Transformation Policies

Policy Code	Positive Ideal Distance D+	Negative Ideal Distance D-	Relative Closenness C	Ranking
T1				
T2				
T3				
T4				1
T5				
T6				

Based on the scores of the six policies in Table 11, T4 has a relative closeness of 1, ranking first among the six policies. T3 and T6 have relatively low relative closeness and comprehensive scores. The main reasons are that T4 has high scores for policy objectives, comprehensive coverage involving intellectual property, independent innovation, market service systems, and talent cultivation, strong policy intensity, extensive use of policy tools, and broad target objects. T3 and T6 have relatively low issuing levels, involve fewer policy objectives, use fewer policy tools, and have more singular target objects, thus ranking relatively low.

4.1 Conclusions

Based on content analysis and coding of IP transformation policies, this paper establishes a four-dimensional analytical framework to determine the IP transformation policy evaluation index system. Using policy quantification standards, the indicators of six selected IP transformation policies are scored, ultimately obtaining comprehensive scores for the six policies. The results show that among the evaluation indicators of IP transformation policies, the weights of policy intensity, policy tools, policy objectives, and policy target objects are 0.249, 0.182, 0.309, and 0.261 respectively, with relatively small gaps. The policy objective evaluation indicator has the greatest impact on IP transformation policy evaluation, while the policy tool evaluation indicator has the least impact. Policy T4 ranks relatively high, while policies T3 and T6 rank relatively low.

4.2 Policy Recommendations

4.2.1 Strengthen Inter-Agency Collaboration in Policy Implementation

The construction of the IP transformation policy system is a systematic project that requires joint promotion by various policy implementation departments to

form synergy in the IP transformation policy system. Currently, China's IP transformation policy system construction is still in the development stage, and there exists a certain degree of "working in isolation" among policy implementation departments, necessitating strengthened collaboration.

4.2.2 Expand the Scope of IP Transformation Policy Targets

Given that current IP transformation policies have relatively limited effects in the IP service field and most policies have obvious regional characteristics, when formulating IP transformation policies, full consideration should be given to public demand for IP transformation and utilization services, incorporating them into the scope of policy targets.

4.2.3 Balanced and Coordinated Advancement of Comprehensive Policy Objectives

Due to the complexity of China's policy implementation environment, different policy objectives exhibit differences during implementation and produce coordination effects. This requires the government to consider the coordinated advancement of multiple policy objectives and the combined use of multiple policy instruments when formulating policies.

Limitations and Future Research

This paper constructs a four-dimensional analytical framework for IP transformation policy evaluation based on policy intensity, policy objectives, policy tools, and policy target objects, and evaluates existing IP transformation policies through 4 primary indicators and 14 tertiary indicators. However, as this paper only systematically reviews and evaluates existing IP transformation policies, there are some limitations. First, in terms of data sources, this paper only selects IP transformation policies issued by the Central Committee of the CPC, the State Council, and their directly affiliated institutions, without including policies issued by local governments or other relevant departments, resulting in a relatively small research scope and limited representativeness. Second, in terms of research methodology, this paper uses the entropy-weighted TOPSIS method to conduct quantitative analysis and comprehensive evaluation across four dimensions, which has certain innovative value but requires further research to make evaluation results more reliable and scientific.

Therefore, future research on IP transformation policy evaluation should strengthen the following aspects: First, expand the research scope of China's IP transformation policies beyond those issued by the State Council and its ministries to deeply analyze the characteristics and patterns of China's IP transformation policies, providing theoretical basis and policy support for future optimization and improvement. Second, further expand research on

collaborative evaluation methods and index systems for IP transformation policies, introducing more dimensions, indicators, and policy content for evaluation based on text analysis methods. Additionally, attention should be paid to two aspects: expanding research on policy evaluation methods and index systems to make them more scientific and objective, and broadening the research scope and depth of factors influencing IP transformation policies to more comprehensively reflect the characteristics and patterns of China's IP transformation policy system and operational mechanism.

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Note: Figure translations are in progress. See original paper for figures.