



Research on Talent Management and Incentive Measures in Chinese Enterprise Research Institutes

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Abstract. Against the backdrop of the deepening of the national science and technology innovation strategy, state-owned enterprise research institutes serve as the core carrier for key technological breakthroughs and achievement transformation, with talent as their core competitiveness. Currently, state-owned enterprise research institutes generally face problems such as insufficient salary competitiveness, a single career path, extensive assessment and evaluation, weak incentives for achievement transformation, and a lack of innovative culture, which restrict the release of innovative vitality. This article is based on theories such as human capital, dual factor, and 3PIM compensation, combined with the characteristics of high education, strong autonomy, emphasis on achievement, and difficulty in quantifying achievements of scientific research talents. It systematically analyzes the pain points of talent management and proposes feasible optimization plans from five aspects: salary system, career development, assessment and evaluation, achievement transformation, and organizational culture. It provides practical reference for state-owned enterprise research institutes to attract, retain, and stimulate talents, and helps promote high-quality development and national strategic implementation.

Keywords: Institute, Talent Management, Incentive Measures, Salary Optimization

1 Introduction

Global technological competition is intensifying, and technological innovation has become the core of national comprehensive strength competition. State owned enterprise research institutes undertake key tasks in strategic fields such as aerospace, information technology, and high-end equipment, and are an important support for the country's strategic scientific and technological strength. Talents, as the primary resource, determine the efficiency and innovation ability of scientific research [1-4]. However, constrained by institutional mechanisms, state-owned enterprise research institutes are at a disadvantage in the competition for talent marketization: the average annual turnover rate of core talents is about 8% -15% [5-6], the salary of high-level talents is only 60% -75% of that of private technology enterprises, and the proportion of personal income

from achievement transformation is less than 10%, resulting in insufficient innovation motivation and low achievement transformation rate[7-8].

In this context, building a management and incentive system that adapts to scientific research laws and meets talent needs has become a key focus of reform for state-owned enterprise research institutes. This article is based on the attributes of state-owned enterprise research institutes and the characteristics of scientific research talents. It combines classic incentive theories with scientific research scenarios, strengthens the practicality of theories and measures, reduces vague discussions, supplements quantitative basis and implementation details, and forms a reform framework that can be directly applied. It not only enriches the human resources theory of specific scenarios, but also provides reference for similar scientific research institutions.

2 Theoretical Foundation

2.1 Theories Related to Talent Management

Human Capital Theory. Human capital refers to knowledge, skills, and innovation capabilities embodied in individuals, constituting the core asset of research institutions. Most talents in SOE research institutes are highly educated researchers, whose human capital features high input, high added value, long cycles, and low substitutability. Their value must be maximized through training, incentives, and career development.

Strategic Human Resource Management Theory. Talent management must align with national strategies and institutional development goals. Resources and systems should be allocated and designed around core tasks such as key technological breakthroughs, achievement transformation, and talent echelon construction, ensuring human resources support strategic implementation.

2.2 Theories Related to Talent Incentive

Maslow's Hierarchy of Needs. Scientific research talents have moved beyond basic physiological and safety needs; esteem and self-actualization needs dominate. Incentives must balance material security with achievement recognition, career growth, and value realization.

Herzberg's Two-Factor Theory. Herzberg's Two-Factor Theory divides incentive factors into hygiene factors and motivator factors. Hygiene factors include salary, welfare, working environment, and basic guarantees, which can eliminate employees' dissatisfaction but cannot directly stimulate work enthusiasm; motivator factors include challenging research, achievement recognition, career promotion, and innovation rewards, which can effectively stimulate employees' initiative and creativity. Subsequent reform proposals in this paper strictly correspond to this theory: hygiene factors match salary, welfare, and basic guarantee optimization; motivator factors correspond to ca-

reer development, performance recognition, innovation incentives, and cultural empowerment, which can precisely match the multi-level needs of scientific research talents.

3P1M Compensation Theory. Compensation is determined by Position, Person, Performance, and Market to achieve internal fairness, individual equity, and external competitiveness, providing a direct framework for salary reform in SOE research institutes.

3 Characteristics of Talent Groups in SOE Research Institutes

The talent groups in state-owned enterprise research institutes have distinct group characteristics adapted to scientific research work, which are the important basis for formulating talent management and incentive measures. More than 70% of these talents hold master's degrees or above, with high creativity and strong autonomy, requiring independent research and flexible scheduling, and resisting excessive administrative intervention that restricts research freedom. At the same time, they have a strong desire for self-actualization, value academic status, industry recognition, and research contributions highly, and are highly sensitive to spiritual incentives such as achievement recognition and career development. In addition, their work outcomes have the characteristics of difficulty in quantification, with long research cycles, strong teamwork and lagging value realization, so short-term economic indicators are not suitable for measuring their work performance; affected by market competition, these talents have high mobility and turnover risk, especially high-level talents are widely targeted by private enterprises, foreign companies and universities, and salary level and career development space are the main driving factors for their job hopping.

4 Current Situation and Problems of Talent Management and Incentive in SOE Research Institutes

4.1 Unreasonable Salary System with Insufficient Attractiveness

The salary system of state-owned enterprise research institutes has weak external competitiveness. Salaries for equivalent research positions in the same region are 25%–40% lower than those in private technology enterprises, with an even wider gap for core high-level talents. The salary structure is monotonous and egalitarian, with fixed wages accounting for more than 70% and performance bonus differentials less than 15%, showing obvious "equal sharing" and a serious disconnect between salary and innovation contribution. The salary adjustment mechanism is rigid, mostly linked to professional titles and seniority rather than personal competence and actual performance. Salary freezes for 2–3 years are common, greatly reducing the attractiveness and retention capacity of salaries for scientific research talents.

4.2 Single Career Development Channel with Limited Growth Space

The career development is strongly bureaucracy-oriented, with more than 80% of promotion resources concentrated on the management track. Professional talents find it difficult to improve their salary or status without administrative positions. The technical promotion system is imperfect: professional title evaluation overemphasizes papers and neglects actual contributions, and more than 60% of researchers believe that promotion standards are misaligned with actual work. There is a lack of institutional career planning: more than 70% of research institutes lack a mentoring system and personalized development paths, leading to blind talent growth and difficulty in building a stable and sustainable echelon of scientific research talents.

4.3 Unscientific Performance Evaluation System with Misguided Orientation

Performance appraisal prioritizes quantity over quality: papers and patents account for more than 50% of the appraisal weight, while indicators related to achievement transformation and engineering application account for less than 20%, directly leading to a quantity-over-quality tendency in scientific research. The appraisal method is single and long-cycle, relying excessively on annual appraisal and lacking milestone and process evaluation, resulting in strong subjectivity of results. The application of appraisal results is weak: the linkage between appraisal results and salary/promotion is low, and the gap between "excellent" and "qualified" is small, greatly weakening the incentive and restraint effects and failing to motivate high-performing and restrain low-performing talents.

4.4 Imperfect Achievement Transformation Mechanism with Insufficient Incentives

The ownership and income distribution of achievement transformation are unclear: the actual proportion of transformation income distributed to research teams is less than 15%, and the individual share is even lower, which cannot fully reflect the value contribution of scientific research talents. The support system for achievement transformation is missing: there is a lack of pilot platforms, market connection, investment and financing services, and the overall achievement transformation rate is less than 10%. The incentive form is too single, relying excessively on one-time bonuses and lacking long-term incentives such as equity, dividends, and project commissions, which is not conducive to stimulating the long-term enthusiasm of talents for achievement transformation.

4.5 Lagging Organizational Culture with Insufficient Innovation Atmosphere

The institutional operation is excessively administrative, with lengthy and cumbersome approval processes that seriously restrict research autonomy and reduce the efficiency of scientific research decision-making. Inter-departmental collaboration is weak and barriers

are high: departmental segmentation hinders knowledge sharing and the efficient development of cross-field research, which is not conducive to collaborative research on core technologies. There is a lack of an innovation-tolerant culture: 45% of researchers choose conservative research due to fear of accountability for failure, which directly restricts the exploration and breakthrough of original and cutting-edge technologies.

5 Optimization Measures

5.1 Salary System Optimization: Based on 3P1M + Two-Factor Hygiene Factors

Adhere to a market-oriented salary design. Core talents are paid by contract, project, or annual salary, with salary levels targeting the top 25% industry percentile, determined with reference to the 2025 national science and technology industry salary survey data and salary levels of leading private technology enterprises. Establish an annual salary survey and dynamic adjustment mechanism, with salary growth rates not lower than the market average to ensure external salary competitiveness. Build a diversified salary structure: the ratio of fixed salary: performance salary: special bonus is set at 5:3:2, derived from the pilot reform practice of more than 20 central enterprise research institutes and the theoretical derivation of 3P1M compensation theory, balancing basic security and incentive orientation. Set up special awards for innovation research, key problem-solving, achievement transformation, patents, high-quality papers, etc., widening the reward gap to 30%–50%, formulated based on common industry incentive practices and the principle of fully reflecting performance differences, effectively breaking egalitarianism and highlighting the value of core contributions. Provide supplementary benefits such as housing subsidies, children's education, supplementary medical insurance, academic leave, and priority access to research equipment to improve hygiene factors and eliminate talent dissatisfaction. Implement a broadband salary system, breaking rank restrictions so that professional talents can get salary increases without promotion, up to the salary level of middle managers, achieving precise alignment between salary and ability contribution.

5.2 Improved Career Development: Based on Needs Hierarchy + Two-Factor Motivator Factors

Build three parallel and interchangeable career development channels: management track (Director → Department Head → Project Supervisor), technical track (Junior → Intermediate → Senior → Chief Engineer), and research track (Assistant Researcher → Researcher → Chief Scientist). Equivalent ranks and aligned salaries across tracks allow free switching for talents, solving the problem of a single promotion channel for professional talents. Promote the reform of professional title evaluation: reduce the weight of papers, raise the weight of achievement transformation, engineering application, and technological breakthroughs to more than 50%, adopt the "representative works + peer review" evaluation method, and add transformation and engineering title tracks to align evaluation standards with actual work contributions. Establish a career

mentoring system with a personalized development plan for each person, clarifying 3–5 year development goals, training directions, and project opportunities, with annual reviews and adjustments to provide targeted growth guidance for talents.

5.3 Performance Evaluation Reform: Strengthening Orientation and Result Application

Set classified and differentiated appraisal indicators: basic research emphasizes originality, high-quality papers, and industry influence; applied research emphasizes patents, technological breakthroughs, and prototype development; achievement transformation emphasizes revenue, industrialization, and market scale; management services emphasize support efficiency, team satisfaction, and guarantee effectiveness, adapting to the work characteristics of different types of positions. Adopt a diversified evaluation method combining project appraisal + quarterly appraisal + annual appraisal + third-party peer review, organically integrating team and individual performance to avoid egalitarianism and improve the objectivity of evaluation results. Strengthen the application of appraisal results: excellent performers receive a 20% salary increase, priority promotion, project leadership, and further training; qualified performers receive normal salaries and improvement support; unqualified performers receive interviews, post adjustments, and special training, and those still failing to meet standards will be removed from research positions, giving full play to the incentive and restraint role of appraisal.

5.4 Improved Achievement Transformation Incentives: Matching Human Capital Value

Clarify the ownership and income distribution rules of achievement transformation: no less than 50% of achievement transformation income is used to reward research teams and individuals, and core contributors account for no less than 40% of team rewards. This rule is formulated in accordance with national policy requirements for achievement transformation incentives in state-owned enterprises and fully reflects the value of human capital. Adopt diversified incentives such as one-time bonuses, revenue sharing, technology investment, equity, options, and project co-investment to achieve an organic combination of short-term and long-term incentives. Count transformation income toward performance for promotion and awards to further stimulate talents' enthusiasm for achievement transformation. Build a full-chain support system for achievement transformation: set up special transformation funds, pilot platforms, legal and commercial support teams, and jointly build transformation bases with enterprises and parks to reduce the market-oriented docking costs for researchers.

5.5 Organizational Culture Construction: Empowering Innovation and Sense of Belonging

Promote de-administration and research empowerment: simplify approval processes, grant research groups greater autonomy in fund use, project selection, and team for-

mation, fully implement the "project manager responsibility system", and return scientific research decision-making power to research teams. Strengthen cross-departmental collaboration and break business barriers: form cross-departmental innovation teams, hold regular academic salons, build shared databases, carry out joint training, and set up an annual "Excellent Collaborative Team" award with collective incentives to promote cross-field and cross-departmental collaborative innovation. Cultivate an innovation-tolerant culture: allocate 10%–15% of scientific research funds to high-risk innovative research, allow exploratory failures within a reasonable range, and impose no accountability or negative impact on appraisal for innovative failures, encouraging researchers to carry out original and breakthrough research.

6 Conclusions

The core contradiction in talent management and incentive in SOE research institutes is the mismatch between the traditional administrative management model and the needs of market-oriented, innovative scientific research talents. Based on human capital, needs hierarchy, two-factor, and 3PIM theories, this paper proposes a systematic solution targeting five shortcomings: market-oriented salary, multi-track development, classified evaluation, achievement transformation emphasis, and innovation culture. All measures comply with SOE institutional constraints, are implementable, executable, and quantifiable, and can effectively attract, retain, and motivate core scientific research talents to unlock innovation vitality.

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