ISSN: 2688-8645

Research on Configuration Path of Incentive Factors of Science and Technology Talents: A QCA Analysis

Hao Dong[1, 2, 3, 4, 5], Jing Wei[1, 2, 3, 4, 5], Jie Cheng[1, 2, 3, 4, 5]

[1]Shaanxi Provincial Land Engineering Construction Group Co. ,Ltd. ,Xi'an, 710075, China

[2]Institute of Shaanxi Land Engineering and Technology Co. , Ltd. , Xi'an, 710075, China

[3]Key Laboratory of Degraded and Unused Land Consolidation Engineering, Ministry of Land and Resources, Xi'an, 710075, China

[4]Shaanxi Provincial Land Consolidation Engineering Technology Research Center, Xi'an 710075, China

[5]Land Engineering Technology Innovation Center, Ministry of Natural Resources, Xi'an, 710075, China

Abstract

Talents are the first resource of scientific and technological innovation, and the key of talents to play a role lies in encouragement.However, there is little literature on the motivational factors of scientific and technological talents.Multiple interactions were studied.Taking 247 scientific and technological talents in Liaoning Province as the research object, the fuzzy set qualitative comparative analysis method is adopted to explore how the incentive factors interact with each other to affect the job engagement of scientific and technological talents.The results show that the salary system is a necessary part of influencing the job involvement of scientific and technological talents, and there are three ways to influence the job involvement of scientific and technological talents. The first way is high performance appraisal, high salary system and high work autonomy.The second path is high performance appraisal, high compensation system and high organizational support.The third path is high salary system, high work autonomy, high organizational support and high achievement development. There are two paths for non-active job involvement of scientific and technological talents, and there is an asymmetric relationship between them.

Keywords

Scientific and technological personnel;Incentive factor; Configuration effect; Path analysis; QCA method.

1. Introduction

Talent is a key element in the development of science and technology innovation, under the innovation drive back view, scientific and technological personnel for the development of the economic transformation and high quality effect is more outstanding In recent years, China's scientific and technological personnel total continues to grow, and further expanded technology talent team According to statistics, by 2018, according to the amount of research and development personnel in our country (full-time equivalent calculation for 4.19 million years, in our country. The total number of research and development personnel surpassed the United States in 2013, ranking first in the world for six consecutive years. However, with the increasing abundance of scientific and technological personnel resources, the problem of scientific and technological personnel unable to play an effective role is highlighted, and the key of talents to play a role is to encourage the CPC Central Committee to adhere to and improve

ISSN: 2688-8645

the socialist system with Chinese characteristics to promote national governance approved by the Fourth Plenary Session of the 19th CPC Central Committee. The decision on a number of major issues concerning the modernization of systems and governance capabilities states that the incentive mechanism for the discovery and training of scientific and technological personnel should be improved, the management system and policy system for science and technology in line with the laws of scientific research should be improved, and the evaluation system for science and technology should be improved. From this point of view, the incentive factors and mechanisms of scientific and technological talents deserve attention and research.

At present, the existing research has extensively discussed the incentive factors of knowledge workers or scientific and technological talents. According to the characteristics of knowledge workers, Mahan Tambo [1] puts forward four main motivation factors from the specific motivation factors: personal growth, work autonomy, business achievement and financial wealth; Zhang Wangjun et al. [2] concluded four incentive modes, namely, compensation incentive, culture incentive, organizational incentive and work incentive, through comparative analysis of incentive factors for knowledge workers between China and foreign countries and between knowledge workers and non-knowledge workers. Shi Chaoying [3] constructed an incentive system for scientific and technological talents from the aspects of spiritual incentive, material incentive and comprehensive incentive. Zhang Shuxia [4] found that the motivation factors of knowledge workers are divided into work motivation factors, external motivation factors and peripheral motivation factors. There are also scholars' opinions on the fair performance appraisal system, the favorable salary and welfare, the harmonious working atmosphere, and the good working conditions. Scholars have proposed different motivational factors and analyzed the impact of a single factor, but few studies have been conducted on the multi-factor interaction of organizational incentives on the job engagement of scientific and technological talents from the perspective of the whole body. In reality, there is not a single motivational factor for scientific and technological talents. But a variety of factors interact with job engagement, and it is necessary to explore the interaction of incentive factors for scientific and technological talents from an overall perspective. The qualitative comparison method is based on the analysis of small and medium-sized samples and is suitable for dealing with the multiple interactions among various variables.

As the old industrial base in Northeast China and the main battlefield of revitalization in Northeast China, Liaoning has a large number of equipment manufacturing enterprises and a large number of scientific and technological talents. In recent years, Liaoning's economic growth has slowed down, and the loss of scientific and technological talents is serious. There are problems in the organizational factors that motivate talents to play a role. From 2005 to 2017, the aggregation degree of scientific and technological talents in Liaoning showed a downward trend, decreasing from 1.64 to 0.80 [5].This phenomenon is widespread in the process of economic development in Northeast China. Therefore, taking Liaoning as an example, it is of great practical significance to discuss how organizational incentive factors affect the job involvement of scientific and technological talents. Therefore, based on the talent incentive theory, this paper takes the scientific and technological talents in Liaoning Province as the research sample, and uses the qualitative comparative analysis method (QCA) to explore the configuration configuration of various influencing factors, distinguish the core conditions and the edge conditions, and then summarizes the multiple effective paths for the efficient incentive of scientific and technological talents.

2. Literature Review

Research on incentive theory has multi-disciplinary, multi-level and multi-dimensional characteristics (Ma Xifang, Rui Zhengyun, 2020).Based on the content view of organizational

ISSN: 2688-8645

motivation, this study regards motivation as factor motivation or will, and regards motivation as the will to achieve organizational goals through high-level efforts [6], as well as the internal factors that promote behavior and the external factors that act as behavior inducers [7]. Organizational motivation refers to the integration of various incentive factors provided by the organization to employees that can stimulate, maintain and regulate employees' behaviors and effectively achieve the goals of the organization and employees, reflecting the internal needs that employees hope to be met by the organization [8]. Job involvement refers to a positive emotion or energetic state displayed by employees at work [9]. It is characterized by vigor, dedication, and focus. Vitality is defined as being full of passion and emotion in the work, dedication is defined as being aware of the general principles and putting them first, and focus is defined as having no distractions and being single-minded for the common good. Job engagement, as a working state, can have a direct impact on individual performance and organizational performance [10]. From the perspective of incentive content, organizations can stimulate the creative vitality of scientific and technological talents by designing different incentive factors, such as performance appraisal, salary system, work autonomy, organizational support, achievement and development, so as to make them actively engage in work, improve organizational innovation ability, and thus improve organizational performance.

2.1. Performance Assessment

Among the organizational incentive factors, performance appraisal focuses on evaluating the phased results and evaluable behavior of scientific and technological talents in their positions through the performance evaluation indicators of assessment standards. Hu Wei and Liu Songbo [11] investigated 1,879 scientific and technological talents in Beijing and found that 52% of them believed that their organizations had a standardized performance appraisal system. They believe that the combination of performance appraisal with salary education and training and position can have a greater incentive effect on scientific and technological talents. Tai Leilei and Liu Xiaofeng [12] proposed that the implementation of relatively fair performance appraisal, job promotion and salary system can encourage young scientific and technological talents to devote themselves to scientific research work efficiently and creatively. He Yanna [13] pointed out that performance appraisal should implement differentiated incentives on the basis of understanding and respecting individuals. Utilitarianism and one-size-fits-all should be avoided in the assessment process. For inexperienced young people, tutors can be arranged to assist in the selection of research directions. At the same time, dedication award and progress award can be set to fully stimulate their innovative ability; Li Yahong and Li Jian [14] emphasized that performance appraisal can stimulate the working motivation of knowledge team members, including team output and personal skills, and has played a very good incentive effect in concrete practice. To sum up, performance appraisal is an important factor to stimulate the work involvement of scientific and technological talents.

2.2. Salary System

Salary system is an important value embodiment of the innovative research activities of scientific and technological talents. This part of the salary income not only includes the narrow sense of money, but also includes a variety of non-monetary forms of satisfaction. Zhang Xueyan and Zhou Xiaohu [11] believe that the annual salary system has internal and external driving functions, so the annual salary system for top scientific and technological talents can be implemented, and an incentive system conducive to innovation evaluation can be constructed. Guo Yingyuan and Zhang Sheng (2015) believe that the key of technological innovation incentive mechanism is to let scientific and technological personnel participate in the income distribution of transformation of scientific and technological achievements. A reasonable salary system can greatly enhance the work enthusiasm of scientific and technological personnel. Xiong Liang [12] emphasized that the organization should establish a salary system based on

ISSN: 2688-8645

the post responsibilities and actual contributions of researchers, enhance internal fairness and external competitiveness, further stimulate the vitality of scientific and technological talents, and provide talent guarantee for the implementation of innovation-driven development strategy. Research shows that the top four incentive factors affecting knowledge workers' job engagement are salary, job nature, job promotion and interpersonal relationship, and salary ranks first, highlighting its importance in the incentive link [15]. Therefore, the salary system has become the key factor affecting the work involvement of scientific and technological talents.

2.3. Work Autonomy

The organization should create a scientific research atmosphere that "advocates innovation, tolerates failure and supports risk taking" for scientific and technical personnel, and give them greater autonomy in their work. The higher their work autonomy is, the easier it is to reduce their job burnout and thus stimulate their work vitality. In view of the characteristics of scientific and technological innovation jobs, the performance growth rate of scientific and technological researchers is relatively slow at present. The creation of a relaxed working environment to encourage scientific and technological researchers to actively explore is more conducive to stimulating the enthusiasm and work enthusiasm of scientific and technological workers to climb the peak of scientific research. Therefore, it is necessary to create a good atmosphere for scientific research, to give scientific and technological talents strong autonomy in their work, and to increase flexible working hours, so as to stimulate the potential of individual innovation. To sum up, work autonomy is an indispensable part of the motivation factors for scientific and technological talents.

2.4. Organizational Support

Scientific and technological personnel cannot work without organizational support. High-level scientific research platform, sufficient scientific research funds and scientific and technological achievements transformation policies will greatly enhance the enthusiasm of scientific and technological workers. Xu Yankun (2020) believes that the government can give full play to its administrative function, increase policy support, establish information exchange platforms, industrial parks and incubators, and provide funding support for scientific research. Zhang Baoling et al. pointed out that sufficient research funds are the key to greatly improve the work commitment of scientific and technological talents. The policy of transformation of scientific and technological achievements is an important part of organizational support. The transformation of scientific and technological achievements refers to the planned marketing of laboratory scientific research achievements, which can not only bring realistic economic benefits to the development of universities, but also improve the income of scientific and technological personnel, effectively stimulate their internal creative vitality and enhance their work enthusiasm. Therefore, organizational support is included in the antecedent variables that affect the job involvement of scientific and technological talents.

2.5. Achievement Development

Scientific and technological talents generally have strong personal growth motivation, which encourages scientific and technological talents to continuously learn, innovate and grow in their organizations and industries (Kong Deyi and Zhang Xiangqian, 2015). Research shows that occupational achievement motivation is to promote individual innovation ability and promote the core elements of innovation behavior [16], and scientific research personnel and general staff of the largest area Don't is that the former has a high achievement motivation, obtaining good results of personal desire more intense, achievement motivation) (internal demand is far greater than the economic interests of the external incentive motivation [17-18]. According to existing studies, knowledge workers believe that the four main factors that motivate them to work hard are the sense of success in the business, the work environment,

ISSN: 2688-8645

compensation and benefits, and personal growth. Among them, the business sense of achievement accounts for 51.3%, highlighting the incentive effect of the sense of achievement on the innovative work behavior of scientific research workers (Chen Jing 'an, Jing Guangyi, 2005).

In order to meet the strong thirst of scientific and technological talents for knowledge, organizing relevant training can not only satisfy their pursuit of knowledge, but also effectively enhance their ability of scientific and technological innovation. The status of training incentive is becoming increasingly prominent (Cai Shutang and Lu Ziyuan, 2015). Shi Guanfeng sorted the incentive factors of knowledge workers and ranked the factors of personal growth and development in the first place, indicating that knowledge workers are eager to continuously improve their personal abilities through learning and training. Based on this, achievement development has become an important factor to motivate scientific and technological personnel to devote themselves to work.

Throughout the existing studies, it is found that there are abundant researches on the influencing factors of organizational motivation, but the research conclusions are relatively simple, which are all explained from the single influencing factor of organizational motivation. In reality, the incentive factors of scientific and technological talents are more complex, and there is no way to better explain the incentive effect of scientific and technological talents only from a single factor Angle. For this reason, this paper studies the multiple effects of the interaction of the influencing factors of organizational incentives, taking the job involvement of scientific and technological talents as the outcome variable, and the performance assessment, salary system, job autonomy, organizational support and achievement development as the antecedent variable. Accordingly, this paper constructs a theoretical model of incentive factors for job involvement of scientific and technological talents, as shown in Figure 1.Based on this, this paper proposes the following corollarys:

Corollary 1: The influencing factors of job involvement of scientific and technological talents are composed of a variety of motivating factors.

Corollary 2: The factors that lead to inactive work are not the only ones, but exist in multiple combined paths, and there is asymmetry with active work.

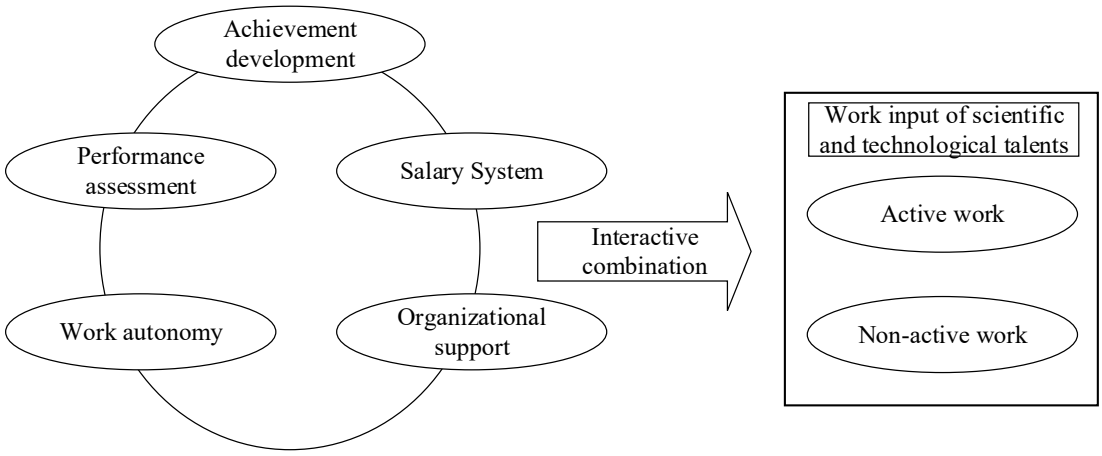

Figure 1. Theoretical Research Model

3. Variable Measurement, Data Collection and Analysis

3.1. Variable Measurement

Based on the interviews with experts, this paper makes a semi-open questionnaire on the motivation factors of scientific and technological talents by searching and reading the related

ISSN: 2688-8645

literature of the motivational factors of scientific and technological talents. Organize the paper and electronic information of the sent and sent back into five incentive factors, including performance appraisal, salary system, work autonomy, organizational support, and achievement and development.202 electronic questionnaires were sent out for the second time, 126 questionnaires were collected and 123 valid questionnaires were collected.SPSS25.0 was used to extract 5 effective factors by using principal component analysis, and then the items with low load on the factors were deleted to form 19 items of formal questionnaire. Among them, the performance test has two items, such as "the current work unit has a relatively clear set of performance appraisal standards"; The salary system consists of three items, such as "Compared with self-paid work, I am more satisfied with my income from scientific and technological work". There are two questions about work autonomy. For example, the question "Have a good degree of autonomy in scientific and technological innovation work"; For example, the transformation of scientific and technological achievements can be strongly supported by relevant policies. There are 7 achievements and development items. Example items include "Through scientific and technological work, personal potential and ability have been fully released and brought into play". The measurement of job engagement refers to the scale translated by Zhang Yiwen and Gan Yiqun, with three items revised. For example, the sample item is "You are full of enthusiasm for the current scientific and technological innovation work, and you maintain a high degree of focus and commitment". All variables in this study were measured by Likert 7-point scale for construct measurement, where 1 means "very inconsistent" and 7 means "very consistent".

3.2. Data Collection

The research data came from 8 cities including Shenyang, Dalian, Fushun, Anshan, Jinzhou and Fuxin in Liaoning Province, mainly involving science and engineering universities, scientific research institutes, listed technology enterprises and other units of different nature. With the help of the company's official website and CNKI platform resources, from November 2019 to March 2020, we conducted an electronic questionnaire survey on single technicians of different sexual qualities. A total of 1109 questionnaires were sent out, 280 were recovered, 33 invalid questionnaires were deleted, and 247 valid questionnaires were obtained. Among them, 80.57% of scientific and technological talents came from universities, 17.41% from science and technology enterprises, and 1.62% from research institutes. Males accounted for 74.49% and females 25.51%;11.34% were under 30 years old, 32.39% were 31~40 years old, 35.22% were 41~50 years old, and 21.05% were over 51 years old;38.87% of senior titles, 34.82% of associate senior titles, 17.41% of intermediate titles and 8.9% of junior titles; Postgraduate students accounted for 66.8%, postgraduate students accounted for 23.89%, undergraduate students accounted for 9.31%;Those who have been working for less than 5 years account for 20.24%, those who have been working for 6 to 10 years account for 23.48%, those who have been working for 11 to 20 years account for 29.15% and those with more than 20 years account for 27.13%.

3.3. Descriptive Statistical Analysis

The mean value, standard deviation and correlation coefficient of the variables of organizational motivation factors are shown in Table 1. As can be seen from Table 1, there is a significant correlation between the antecedent variables and job engagement, which is in line with expectations.

ISSN: 2688-8645

Table 1. Descriptive statistical analysis results (N=247)

Variable	Mean Value	Standard Deviation	1	2	3	4	5	6
1.Job Involvement	2.71	1.01	1					
2.Performance Assessment	2.94	1.15	0.593**	1				
3.Salary System	3.64	1.26	0.452**	0.565**	1			
4.Work Autonomy	2.82	1.03	0.494**	0.511**	0.563**	1		
5.Organizational Support	3.18	1.04	0.561**	0.575**	0.569**	0.699**	1	
6.Achievement Development	2.96	1.06	0.607**	0.572**	0.669**	0.665**	0.792**	1

Note:* means P<0.05 means ** means p<0.01, two-tailed test

3.4. Reliability and Validity Analysis

Reliability and validity tests were conducted on the questionnaire data results, and the results are shown in Table 2. Cronbach'sα coefficient of all variables is greater than 0.7, which proves that this questionnaire has good reliability. The structural validity test by factor analysis showed that the KMO value was 0.941, greater than 0.7, indicating that the correlation degree among various items was good. As can be seen from the data in Table 2, the lowest AVE value is 0.42, meeting the basic requirements of validity (AVE value above 0.36 is acceptable).QCA method focuses on the progressive analysis of the interaction between variables, which breaks through the limitation of the independence of variables in the traditional method and acknowledges the correlation between variables. Therefore, the requirement for validity can be relaxed appropriately. To sum up, all the 19 items in the questionnaire meet the requirements of validity.

Table 2. Reliability and validity analysis results

Variable	Cronbach's α	Minimum factor load factor	AVE	CR
Performance Assessment	0.829	0.819	0.68	0.81
Salary System	0.876	0.742	0.60	0.82
Work Autonomy	0.723	0.548	0.48	0.64
Organizational Support	0.867	0.540	0.42	0.78
Achievement Development	0.945	0.621	0.55	0.89
Job Involvement	0.780	0.539	0.45	0.62

4. QCA Analysis

4.1. Research Method

Qualitative comparative analysis (QCA) is a new method for analyzing complex causality of configuration problems based on Boolean algebra and set theory. QCA, as a new method combining quantitative and qualitative comparative analysis, provides a new way of thinking for management research on recurrent causality such as asymmetry, concurrent causality and equivalence. At the same time, it provides a strong support for the study of configuration problem combining phenomenon-driven and theory-driven. According to variable types, QCA is divided into CSQ-CA (qualitative comparative analysis of clear sets), MVQCA (qualitative comparative analysis of multiple values) and FSQCA (qualitative comparative analysis of fuzzy

ISSN: 2688-8645

sets).This paper selects fsQCA, which is widely used, to analyze the influence of configuration effect of organizational motivators on job engagement of scientific and technical talents.

4.2. Variable Calibration

The use of QCA method needs to calibrate the original data and transform it into collective affiliation, which is the process of assigning collective affiliation to the case .The fuzzy set method requires that the root data theory should set up a set of categorization criteria, and set up three critical bound values of the exact criterion and external knowledge of the root data: complete affiliation, cross point and complete unaffiliation, and the membership degree of the set after transformation is between 0 and 1.Referencing the practice of Fiss et al, this paper sets 5 condition variables and 3 anchor points of result variables,7 as "full membership",4 as "cross points", and 1 as "complete non-membership".

4.3. Analysis of Necessity

Before the configuration analysis, necessary condition analysis should be carried out on a single variable to test the necessity of the single antecedent variable for the active work participation of scientific and technological talents. The results of necessary condition analysis are shown in Table 3.

One measure of the importance of a requirement is consistency. In general, as long as the consistency coefficient of the antecedent condition variable is greater than 0.9, it can be considered as a necessary condition for the result. According to Table 3, the uniformity coefficient of high salary system is 0.926, greater than 0.9, that is, the salary system is a necessary condition for active work participation. The consistency coefficient of the single antecedent condition of the non-high incentive factor did not reach 0.9, which did not constitute a necessary condition. Therefore, with the help of fsQCA, this paper further discusses the combination path of active and inactive job involvement.

Table 3. Necessity analysis results of antecedent variables

Conditional Variable	Outcome Variable	
	Active work	Non-active work
Performance Assessment	0.836	0.379
~Performance Assessment	0.434	0.884
Salary System	0.926	0.522
~Salary System	0.555	0.744
Work Autonomy	0.769	0.434
~Work Autonomy	0.451	0.802
Organizational Support	0.876	0.420
~Organizational Support	0.320	0.852
Achievement Development	0.841	0.370
~Achievement Development	0.421	0.891

4.4. Configuration Analysis

Through qualitative comparative analysis of fuzzy sets, complex solutions, contracted solutions and intermediate solutions are obtained. The complex solution only analyzes the actual observed cases and does not use the logical remainder; The reduced solution includes all possible logical residuals; The intermediate solution is only for the logical remainder that conforms to theory and practice. In general, compared with complex and contracted solutions, scholars tend to report intermediate solutions and distinguish core conditions from edge conditions in combination with reduced solutions. For the condition that appears in both the

ISSN: 2688-8645

contracted solution and the intermediate solution, it is defined as the core condition. For conditions that only appear in intermediate solutions, they are defined as edge conditions. Using fsQCA3.0, according to Ragin's suggestion, this paper sets the consistency to 0.8 and the frequency to 1. Combined with the requirement that PRI consistency is greater than 0.7, three paths of active job involvement and two paths of non-active job involvement are finally obtained (see Table 4).

Table 4. Active/non-active Work Configuration

Conditional Variable	Active Work Engagement			Non-active Work Engagement	
	H1	H2	H3	NH1	NH2
Performance Assessment	·	●			⊗
Salary System	·	·	·		·
Work Autonomy	●		●	⊗	⊗
Organizational Support		●	·	⊗	·
Achievement Development			·	⊗	
Consistency	0.844	0.805	0.821	0.969	0.979
Original Coverage	0.669	0.762	0.695	0.812	0.356
Unique Coverage	0.020	0.082	0.037	0.475	0.020
Solution Consistency	0.854			0.963	
Solution Coverage	0.819			0.832	

Note: ● represents the presence of the core condition, · represents the absence of the core condition, ⊗ represents the presence of the edge condition, ⊗ represents the absence of the edge condition, and "Blank" represents the presence or absence of the condition

As can be seen from Table 4, under the interaction of organizational motivation factors, 3 active job involvement paths and 2 non-active job involvement paths are generated, and the consistency of the 5 paths is 0.844, 0.805, 0.821 and 0.969, 0.979, respectively. Indicates that three paths constitute sufficient conditions for active work involvement, and two paths constitute sufficient conditions for non-active work involvement. The coverage rates of the model solutions are 0.819 and 0.832, respectively. That is to say, the three paths largely explain the original cause of the active job involvement of scientific and technological talents, and the non-active job involvement also has a similar explanation.

4.4.1 Analysis of the Active Work Involvement Path of Scientific and Technological Talents

H1: performance appraisal * * work independently, salary system show that regardless of weaves group can provide a good support, that can genuinely feel the achievements of science and technology development value, as long as an organization to give scientific and technological personnel sufficient work authorization, reasonable and fair performance appraisal and compensation system, can arouse the enthusiasm for science and technology talents' job involvement, the path once again to verify the work independently The important role played as a key element. In order to give full play to the creative ability of scientific and technological talents, it is not always important to create a cultural environment suitable for the growth of innovative talents. We should abandon the shackles of traditional concepts on talents, vigorously advocate the spirit of innovation, and encourage scientific and technological innovation talents to have the courage to try and not fear failure (Liu Bing et al.,2018).This combination path is suitable for the spontaneous combustion type of scientific and technological talents. The biggest characteristic of this kind of scientific and technological talents is that they are not affected by the external environment, can realize self-drive to the

ISSN: 2688-8645

maximum extent, and are full of enthusiasm and vitality for the scientific and technological work they are engaged in. Aiming at the spontaneous combustion type of scientific and technological talents, the rational use of this combination path will greatly enhance their work involvement.

H2: Performance appraisal * salary system * organizational support, indicating that if there is a scientific performance appraisal system, strong organizational support for scientific and technological talents and a competitive salary system, scientific and technological talents can be stimulated even if their self-achievement sense of value is not strong and their work autonomy is not high. This combination path is suitable for the external force driven scientific and technological talents. If the organization provides excellent work support for such talents and adopts scientific performance appraisal system to rationalize and supervise them, their work enthusiasm will be greatly ignited, their work potential will be released, and they will show positive work input.

H3: salary system * work autonomy * organizational support * achievement and development, Show that organization does not pay attention to performance evaluation, and attention to scientific and technological personnel working since the sovereign, build good innovative culture environment, fully empowered, give employee career value feeling, pay attention to personal growth, provide competitive remuneration and good organizational support conditions, such as led technology innovative talent fully release subject, show the positive work. Under this path, work autonomy is the core condition, while salary system, organizational support and achievement development are the marginal conditions, playing an important role. The above approaches play a prominent role in the post-80/90 generation of scientific and technological talents, because the post-80/90 generation of scientific and technological talents are full of vitality, and technology enterprises advocate innovation, give full authorization to employees, attach great importance to employees' work autonomy, and can provide good organizational support and reasonable salary treatment, so as to improve the independent innovation vitality of such employees.

4.4.2 Path Analysis of Non-active Work Involvement of Scientific and Technological Talents

NH1:~ Work autonomy *~ Organizational support *~ Achievement and development, indicating that no matter whether the organization has a good performance evaluation system or salary system, when the organization does not give scientific and technical talents high autonomy in work and lack of innovation culture and corresponding support conditions, the sense of value of achievements of scientific and technical talents. Low, it will greatly inhibit its innovative ability to play. The reason for this phenomenon is that organizations are not fully aware of the importance of scientific and technological talents to their own and even economic and social development, not to mention that it is their responsibility to provide good external working conditions for them. The lack of work autonomy and organizational support as the core conditions, coupled with the lack of work achievement and social respect for scientific and technological talents in the marginal conditions, even if there is a good performance appraisal system and corresponding salary system within the organization, the work involvement of scientific and technological talents cannot be fundamentally stimulated.

NH2: ~ performance appraisal * * ~ * group independently woven salary system support, can show whether employees feel development achievements, if the organization has failed to establish clear performance appraisal system, and does not give employees a certain autonomy, even offer very attractive salary system and good organization support conditions, also cannot essentially incentive talents of science and technology work. As input. This path demonstrates the role of job autonomy and performance appraisal. Therefore, organizations should strive to give scientific and technological talents greater autonomy in their work, create an inclusive academic atmosphere for them, advocate the research spirit of being brave in innovation and

ISSN: 2688-8645

not afraid of failure, and adopt a fair and just performance appraisal system to stimulate the individual potential of scientific and technological talents.

By analyzing the combination of three factors affecting the active job involvement of scientific and technological talents, it is found that path H2 explains 76% of the outcome variables, and the index coverage is higher than that of path H1 and H3, which proves that most organizations have achieved high job involvement through path H2, indicating performance appraisal, salary system and group. The combination of three factors can motivate the scientific and technological talents to work. The existence of path H1 and H3 indicates that the influence path of scientific and technological talents' active work input is diverse. By analyzing the combination paths of two negative incentive factors, it is found that path NH1 explains 81.2% of the outcome variables, and its index coverage is much higher than that of path NH2, which proves that both of these two paths inhibit the innovation behavior of scientific and technological talents in the organization, and path NH1 is more difficult to motivate the work engagement of scientific and technological talents.

5. Conclusion

5.1. Research Conclusions

(1) Salary system is a key factor to motivate scientific and technological talents to work actively. It is found that the salary system is the necessary condition that affects the job involvement of scientific and technological talents. As a marginal piece, salary system exists in all three configurations of active job involvement, but it is not the absolute influencing factor of stimulating job involvement of scientific and technological talents. Therefore, the organization to establish a reasonable salary system is the key to stimulate the work of scientific and technological talents.

(2) The influencing factors of scientific and technological talents incentive accord with the essence of collection. Inspiring factors of scientific and technological talents' active work involvement are multifaceted, and unilateral influencing conditions cannot motivate scientific and technological talents' active work, which proves corollary 1.There is one or more core conditions and one or more auxiliary conditions in the combination of factors that motivate the active work involvement of scientific and technological talents. The combination paths of core conditions and auxiliary conditions jointly influence the work involvement of scientific and technological talents.

(3) The combination of multiple factors produces the influencing factors of non-active job involvement of scientific and technological talents, and there is a non-symmetric relationship with the influencing factors of active job involvement. This study found two combined paths of non-active job involvement of scientific and technological talents, and by comparing the three paths of active job involvement, it was found that the influencing factors of motivating the job involvement of scientific and technological talents were asymmetrical, that is, the active job involvement path was not the reverse path of non-active job involvement, which proved Corollary 2.The incentive problem of scientific and technological talents is complex and has certain regularity at the same time.

5.2. Management Enlightenment

(1) Establish a salary system that can reflect the market value and social value of scientific and technological talents. As a necessary condition, salary system plays an important role in the incentive process of scientific and technological talents. As a knowledge-based group, scientific and technical personnel have a strong spiritual pursuit and desire to be respected by the organization and recognized by the society, but the basic material needs are also indispensable. In a sense, the salary income is an important reflection of the value of scientific and

ISSN: 2688-8645

technological talents and the status of the society, so the labor value of talents should be reflected in the salary. In 2017, the Liaoning Provincial Government issued the Implementation Opinions on Implementing the Distribution Policy Oriented by Increasing the Value of Knowledge, which pointed out that researchers should gradually increase their income level through salary, encourage researchers to obtain research income through the transformation of scientific and technological achievements, and encourage qualified state-owned scientific and technological types. Enterprises to sell equity, equity incentive, equity options and other ways. In 2019, Liaoning Leading Group of Scientific and Technological Innovation issued the Work Plan on Further Deepening the Reform of Scientific and Technological System and Conducting the Pilot Program of Policies and Incentive for the Transformation of Scientific and Technological Achievements, which specifically explained the innovation mode of transformation of scientific and technological achievements, the optimization of the organization mode of scientific research management, and the improvement of the incentive distribution mechanism for scientific and technological innovation. The work plan has improved the salary system of scientific and technological talents, emphasized various incentive methods according to the value of knowledge, and stimulated the working vitality of scientific and technological talents.

(2) Establish a combined incentive model with organizational support and performance appraisal as the core conditions and salary system as the auxiliary conditions. From the combined path H2, it can be found that when the organization has good organizational support, scientific and reasonable performance appraisal system and fair salary system, the work investment of scientific and technological talents can be reflected. Therefore, according to the characteristics of scientific and technological talents, organizations can consider implementing the combined incentive mode of "organizational support + performance appraisal + salary system". In the survey of Liaoning science and technology enterprises, it is found that scientific and technological talents pay more attention to scientific research platform, project support and perfect support mechanism. The most important reason for brain drain is not lack of funds, but lack of platform. In 2019, Liaoning Province has built a series of scientific and technological research centers, creating national platforms in the fields of artificial intelligence and biology, and there are 1,500 provincial-level platforms in the province[14].The Notice on Several Measures to Deepen the Reform of "Delegation, Regulation and Service" of Provincial Science and Technology Plan Projects and Fund Management points out that the burden of researchers should be effectively reduced and the efficiency of the use of financial research funds should be improved. Scientists should be fully engaged in their research projects, and complex approval processes should not hamper their work. Therefore, it is necessary to do a good job of external guarantee work in the early stage of scientific research, so that the main energy of scientific and technological talents is devoted to scientific and technological innovation activities, and the working environment is effectively optimized. When engaged in scientific and technological innovation activities, appropriate investment in research and development should be given, and the construction of hardware conditions such as laboratories should be strengthened to provide a comfortable working environment. For example, Shenyang Blower Group Co., Ltd. has a research team of 1600 people, whose annual research investment accounts for 5%-7% of sales revenue. Science and technology input is an important driving force for the development of innovation capability in the future, which can greatly enhance the enthusiasm and vitality of scientific and technological talents for innovation work.

(3) To establish a variety of combined excitation modes with work autonomy as the core condition. According to Path H1 and Path H3, organizations can implement the combined incentive mode of "work autonomy + performance appraisal + salary system" and "work autonomy + salary system + organizational support + achievement and development" for different types of scientific and technological talents. Appropriate flexible time arrangement for

scientific and technological talents, flexible working system, to help them balance work and life, promote their knowledge sharing, stimulate their innovative work potential and vitality. At the same time, from the perspective of the path of non-active job involvement, the influencing factors of scientific and technological talents' job involvement have asymmetry, and the organization should avoid the implementation of single incentive mode and reverse combination incentive mode.

5.3. Shortcomings and Prospects

This research also exists in a certain limit, which is worth further exploration. Firstly, based on the incentive content view, this paper studies the influence of organizational incentive factors on the job involvement of scientific and technical talents. Limited by the number of cases and the degree of detail, whether other factors are applied to the job involvement of scientific and technical talents remains to be explored further. Secondly, this paper analyzes the multiple interactions of organizational motivation factors based on QCA method, and other empirical methods can be used for demonstration from different perspectives in the future.

Acknowledgments

Project fund: Inner scientific research project of Shaanxi Provincial Land Engineering Construction Group “Development and Application of Land Engineering Digital Scientific Research Management Information System” (DJNY2021-16)

References

[1] LOCKER E A, LATHAM G P. What should we do about motivation theory? six recommendations for the twenty-first century [J]. Academy of management review, 2004,29(3): 388-403.

[2] ALEGRE J, CHIVA R. Assessing the impact of organizational learning capability on product innovation performance: an empirical test[J]. Technovation, 2008, 28 (6) :315-326.

[3] HOFMAN E. HALMANJ I M. SONG M. When to use loose or tight alliance networks for innovation? empirical evidence[J]. Journal of Product Innovation Management, 2017, 34 (1):81-100.

[4] GUO B. PANG X. LI W. The role of top management team diversity in shaping the performance of business model innovation: a threshold effect[J]. Technology Analysis &. Strategic Management, 2018,30(2) :241-253.

[5] MEYER H H, KAY E. FRENCHJ R P. Split roles in performance appraisal[J]. Harvard Business Review. 1965,43(1):123-129.

[6] ADLER P S. CHEN C X. Combining creativity and control: understanding individual motivation in large-scale collaborative creativity [J]. Accounting Organizations &. Society, 2011 ,36(2):63-85.

[7] RYAN R M, DECI E L. A self-determination theory approach to psychotherapy: the motivational basis for effective change [J]. Canadian Psychology/Psychologie Canadienne, 2008,49(3):186-193.

[8] HOLLENSBE E C, GUTHRIE J P. Group pay-for-performance plans: the role of spontaneous goal setting[J]. Academy of Management Review, 2000, 25(4) :864-872.

[9] DELANEY T J, HUSELID M A. The impact of human resource practices on perceptions organizational performance[J]. Academy of Management Journal, 1996, 39 (4): 949-969.

[10] DECI E L, RYAN R M. The"What"and"Why"of goal pursuits: human needs and the self-determination of behavior [J7. Psychological Inquiry, 2000, 11(4):227-268.

[11] CHEN Z, ARYEE C S. Delegation and employee work outcomes: an examination of the cultural context of mediating processes in China[J]. Academy of Management Journal, 2007,50(1) :226-238.

[12] BIEMANN T, KEARNEY E, MARGGRAF K. Empowering leadership and managers' career perceptions: examining effects at both the individual and the team level [J]. The Leadership Quarterly, 2015,26(5) :775-789.

ISSN: 2688-8645

[13] KEM M, BEEHR T A, PREWETT M S. Employee responses to empowering leadership: a metaranalysis[J]. Journalof Leadership &. Organizational Studies, 2018,25(3):257-276.

[14] SCHILPZAND P, HOUSTON L, CHO J. Not too tired to be proactive: daily empowering leadership spurs nextmorning employee proactivity as moderated by nightly sleep quality[J]. Academy of Management Journal, 2018,61(6):2367-2387.

[15] AHEARNE M, MATHIEU J, RAPP A. To empower or not to empower your sales force? an empirical examination of the influence of leadership empowerment behavior on customer satisfaction and performance. [J]. Journal of Applied Psychology, 2005,90(5):945-955.

[16] HUY Q N. An emotion-based view of strategic renewal[J]. Advances in Strategic Management, 2005,22(1):3-37.

[17] ASHFORTH B E. Emotion in the workplace: a reappraisal [J]. Human Relations, 1995,48(2):97-125.

[18] WEICK K E, WESTLEY F. Organizational learning: affirming an oxymoron[M]. Handbook of Organization Studies, London: Sage, 1996.