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Research on Practice of Human Capital Pricing Within the Chinese Aeronautical Manufacturers

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Abstract

With the economic globalization and entry's into World Trade Organization (WTO), human capital pricing has been great strategy fulcrum of Chinese economic growth gradually. At present, sufficient theory guidance on human capital pricing can't be supplied because of studies on human capital pricing is underway stage. This paper, based on the international studies on human capital pricing, analyzes the practice of human capital pricing within Chinese aeronautical manufacturers via statistical analysis by the usage of Statistic Product of Science and Society (SPSS). It aims at identifying the key factors of human capital pricing in China, which can provide decision support for Chinese aeronautical manufacturers.

Key words: Human capital pricing; Statistical analysis; Chinese aeronautical manufacturers; Factor analysis

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INTRODUCTION

The theory of human capital has become an essential branch in the system of economic theory since Schults established the conception of human capital in 1960 (Schultz T.W., 1961). As the relevant research gradually deepened, as the core part of the human capital theory, human capital pricing has attracted lots of attentions from the scholars around the world and has become the leading edge problem in current research of human capital. One of the remarkable contributions of the sixteenth Central Committee of Communist Party of China was that it straightforward presents whether the various production elements, for instant management, technology, labor capital, etc., should join the income distribution and the principle of distribution based on the contribution of their own was reasonable. The Enterprises Institute of the National Council Research and Development Centre of China issued a report named Human Capital Management in Transitional Enterprises of China in Beijing on 24th, April 2005, which pointed out that through 20 years' market economic reformation, the enterprises of China had strong promotion in establishing market employment structure and that the reward treatment level of the top managers in the enterprises had obviously progressed, moreover, distribution based on elements and inclination to the leading posts had gradually become a driving force. At present, the largest income gap between the top managers and the ordinary employees at domestic is 50 times. Therefore, the research of human capital pricing, especially finding out scientific evidence for such large gap in human capital pricing, will provide a practical and guiding significance for the implementation of enterprises management. As for the development of Chinese aeronautical industry, macro environment and structure element had admittedly influenced the self-innovation of aeronautical industry, simultaneous, solving the problems of the lack of scientists and technicians and deficiency

of stimulation structure on the process of self-innovation is in an urgent edge, which need to be solved efficiently. Otherwise, the initiation of the project called "huge airplane" during the Eleventh's Five Plan for China will not be an auto-drive of the self-innovation of aeronautical industry. Comparing with the advantages of the advanced aeronautical manufacturers in Europe and US, Chinese aeronautical enterprises should attach importance to human capital advantage whose main characters are high quality and low cost. Based on the current related literatures, this paper investigated the current practice status of human capital pricing within Chinese aeronautical industry through the statistical analysis via the collected data, which could provide the advice for governments in their efforts to make corresponding policies.

Since 60th of the 20th century, the initial research of human capital pricing theory came from the works of the pioneers, such as Schultz, Becker, Mincer (Schultz T.W., 1961; Mincer Jacob, 1962; Mincer Jacob, 1962). Until 80th of the 20th century, through the efforts from economists such as Romer, Lucas, etc, new economic development theory was formed, in which the human capital factor as an independent variable was introduced (Romer P. M., 1986; Lucas, E. Robert, 1988; Jennifer Mann, 2002). However, these researches mainly focused on analyzing the effects of human capital to the social economy in the macroscopical level, and did not come to the analysis of related problems on human capital pricing in the microcosmic level. Less research of human capital pricing in the related specific certain industry was found, this paper will make some contribution for this topic within Chinese aeronautical industry.

1. Methodology

1.1 Questionnaire Development

The empirical data used in this paper consisted of questionnaire responses from employees including managers. The questionnaire was from the content of human capital pricing of the advises of top managers of aeronautical manufacturers and college scholars who have engaged in human capital pricing at domestic with 22 relevant problems. The questions were answered using a five-point Liker-type scale (e.g.1 = not considering it, 2 = planning to consider it, 3 = consider it currently, 4 = initiating implementation, 5 = implementing successfully). In order to avoid confusing respondents on five-point scales, we provided brief explanation at the beginning of each section in the survey questionnaire. Detailed items for the survey questionnaire, are shown in Table 2. From November 2006 to August 2007, we put forward 270 pieces of questionnaire survey papers and received 181 pieces of effective papers.

1.2 Descriptive Statistical Analysis and Factor Analysis

In this paper, two methods were used, the first of which is descriptive statistical analysis, and the second of which is factor analysis. The previous one was performed through the values of means and standard deviations, and the latter one is used to analyze the practice of human capital pricing within Chinese aeronautical manufacturers. Factor analysis is a way to fit a model to multivariate data, estimating their interdependence. It addresses the problem of analyzing the structure of interrelationships among a number of variables by defining a set of common underlying dimension, the factors, which are not directly observable, segmenting a sample into correlative homogeneous. Since each factor may affect several variables in common, they are known as "common factors", the detailed information was showned in reference (CHEN A., 2007).

2. SURVEY RESULTS

2.1 Descriptive Analysis

Due to the limitations of the length of this paper, the data of the mean values and standard deviations for descriptive statistical analysis for the collected data were omitted. Through the descriptive statistical analysis process, it is obvious that the mean values of the majority of 22 respects of human capital pricing in the investigated aeronautical manufacturers are between 3-4, which indicates that these manufacturers had considered the content and implementation of human capital pricing and some of manufacturers had come into the implementation.

2.2 Factor Analysis

The main application of factor analysis were to classify and to reduce the number of variables, and to structure the relationships between them. Factor analysis attemptd to identify underlying variables or factors, which could explain the pattern of correlations within a set of observed variables. Factor analysis has been performed using the principal component method. The eigenvalues of the sample covariance

Table 1
Eigenvalue and Cumulative Percentage of Factors

Principal factors	Y1	Y2	Y3	Y4	Y5	Y6
Eigenvalue	7.037	2.607	1.770	1.643	1.384	1.189
Cumulative percentage (%)	31.985	11.849	8.044	7.469	6.292	5.406
Accumulative cumulative percentage (%)	31.985	43.833	51.877	59.346	65.639	71.045

were shown in Table 1. As for factor analysis, it is usual to consider a number of factor equal to the number of eigenvalues higher than 1. This paper considered that the number of factors is able to explain 70% of the variables. In our results, up to six factors satisfied the condition. Table 1 also illustrated the percentage of variance explained by each other and the cumulative variance. The considered six factors accounted for more than 70% of the total sample variance and, therefore, represented the 22 stating variables sufficiently and accurately. The varimax method is an orthogonal rotation method that minimizes the number of variables that have high loadings on each factor. This method simplifies the interpretation of the factors. Table 2 reported the results of the rotated factor loadings with varimax rotation.

Table 2
Rotated Component Matrix

Investigated items	Six principal components					
	1	2	3	4	5	6
Rewarding treatment is different according to the distinctive characteristic of post and salary performance	0.775	-0.111	0.322	-0.140	0.148	0.090
Manufacturer has a correlative consummate profit sharing plan according to different sections or middle-level and high-level managers	0.735	0.286	0.322	0.063	-0.081	0.123
As for different sections or employees, manufacturer has a sharing plan based on cost saving and profit increasing	0.745	0.413	0.173	-0.033	0.055	0.008
Rewarding treatment level of the directors is related close to the manufacturer performance	0.800	0.243	0.093	0.126	0.104	-0.133
Rewarding treatment structure of the directors has reasonable stimulation and limitation term	0.742	-0.038	0.224	0.318	0.067	0.142
The relative bigger gap for incentive system between top managers and other staffs in manufacturer can make efficiency of top managers' work	0.738	0.030	0.032	0.400	-0.018	0.339
There are stock ownership and stock option for staffs in manufacturer in order to motivate them to participate into the work	0.671	0.075	0.117	0.048	0.046	-0.246
Evaluation of the management level is based on the comprehensive evaluation system which is a joint of the whole condition of the industry and the financial performance of the manufacturer	0.573	-0.100	0.436	0.293	-0.061	0.110
Managers' interests are related to venture mortgage and postponed salary	0.561	0.281	-0.177	-0.378	-0.017	-0.246
Staff reward contains salary with skill capability	-0.080	0.772	0.038	0.167	0.286	-0.100
As for successful staffs or teams pursuing in technology innovation, the manufacturer motivates them by money reward such as promoting basic salary, cash bonus, stock, etc	0.252	0.709	0.035	0.033	-0.036	-0.065
There are many kinds of no-money incentive especially for successful staffs pursuing in technology innovation	0.138	0.681	0.430	0.177	-0.017	0.066
Establishing career consuming reward system, which aims at setting up the number of consuming sum based on different career. If there is surplus at the end of year, sharing it; if over-used, taking it by oneself	-0.649	0.510	-0.016	-0.028	-0.107	0.045
Comparing with other companies at the same industry at domestic, high-level managers of the manufacturer have a higher payment level	0.237	0.319	-0.071	0.299	0.024	-0.733
The manufacturer provides spirit motivation to the people who give variety of reasonable suggestion and ideas for management innovation	0.279	0.379	0.697	0.016	0.033	0.216
The manufacturer provides many kinds of corporeal motivations to the people who give variety of reasonable suggestion and ideas for management innovation	0.295	0.094	0.770	0.008	0.104	-0.028
The management level possesses variously reasonable and long-term or short-term stimulating payment structures	0.071	-0.035	0.569	0.533	-0.001	-0.229

To be continued

Continued

Investigated items	Six principal components					
	1	2	3	4	5	6
The directors adopt the terms of openness and clarity of appointing general manager	0.312	0.133	-0.083	0.631	-0.151	-0.045
Other high-level managers are nominated by general manager or nomination committee, and also are appointed with openness and clarity	-0.046	0.261	0.193	0.788	0.292	-0.027
Evaluation of the management is based on the comprehensive system, which includes finance, processing, innovation, consumer' s satisfaction, etc	0.097	0.189	-0.053	0.110	0.779	0.266
Rewarding treatment of the management level is related to their performance, which makes it more incentive	0.082	-0.046	0.130	-0.043	0.882	-0.131
The performance evaluation for staff or working-team is strictly based on the previously planned targets	0.442	0.259	-0.004	0.204	0.251	0.599

According to the results of factor analysis and the original information reflected in the factors, this paper redefined the six principal factors as follows: Y_1 denoted manufacturers surplus demanded and shareable design; Y_2 denoted rewarding design for particular employees; Y_3 denoted stimulation of management and innovation; Y_4 denoted employment of high-level manager; Y_5 denoted performance evaluation of management level; Y_6 denoted performance evaluation of staffs. In addition, we did not hesitate to suppose Y_7 as other factors and apply this principal factors to illuminate the messages excluded in the previous six principal factors, and its cumulative percentage is 28.95%.

According to the cumulative percentage of the six principal factors in Table 1, this paper obtained the practical behavior equation of human capital pricing within Chinese aeronautical manufacturers as follows:

$$Y = 0.32\ Y_1 + 0.118\ Y_2 + 0.080\ Y_3 + 0.074\ Y_4 + 0.063\ Y_5 + 0.054\ Y_6 + 0.290\ Y_7$$

The aboove equation indicates that Chinese aeronautical manufacturers had paid more attention to the distribution of shareable design of the residual right including stock option shareable design, staff shareholder design, profit sharing design, etc, which occupied cumulative percentage of 32.0%; Moreover, manufacturers put the emphasis on the rewarding stimulation on the particular staff who mainly are technicians, which indicates that Chinese aeronautical manufacturers put importance to the technology innovation, aiming at establishing the capability of the competition via technology innovation; 8.0% of the cumulative percentage of the management innovation stimulation indicated that Chinese aeronautical manufacturers had taken some actions on the management innovation stimulation while recognizing the technology innovation. The relative small coefficient of management innovation stimulation reflected that the implementation potency dimension was not enough; small coefficients of the high-level managers' employment and the performance evaluation for the manager level and stuffs indicated that Chinese aeronautical manufacturers should attach more importance on these respects which had not been considered to have significant effect on stimulating the innovation of human capital, and indicated that most of Chinese aeronautical manufacturing enterprises did not implement human capital pricing practice in these three respects.

CONCLUSIONS

Along with the intension of the global marketing competition and the strategy demand of the national defense power, the issues on aeronautical industry was listed into National Middle and Long-run Science and Development Planning Program of China during the period from 2006 to 2020. In order to increase the competition capability of Chinese aeronautical manufacturers, it is necessary to make appropriate price and reward for human capital of the aeronautical manufacturers, and to stimulate the potential creativities of managers and technicians of Chinese aeronautical manufacturers, and to convert the traditional system restriction in the past to present system management with incentives characteristics. Throughout enforcing the human capital pricing within Chinese aeronautical manufacturers, which can help the manufacturers to retain and own more human capital, and to increase the innovation capability and global competitive capability.

In conclusion, human capital pricing is an effective method to enhance the comprehensive competitive capability of Chinese aeronautical manufacturers, by which Chinese aeronautical manufacturers could improve global position by enforcing human capital pricing and joining in the well-known global famous enterprises' human capital system. In addition, by using human capital pricing, Chinese aeronautical manufacturers could reduce the loss of technicians, and enhance the stock of the human capital, and enhance the manufacturers' economic performance. In this way, it is possible for Chinese

aeronautical manufacturers to become the converge space for the global human capital, especially those with the excellent skills, and make outstanding performance in the fierce global human capital competition.

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