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The Impact of Enterprise Management Efficiency on Human Capital†

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Abstract

The 2 main research objectives of this paper are to examine the relationship between firm management efficiency and the effect of human capital accumulation, and to examine the relationship between firm management efficiency and the level of vocational education of employees. This paper collects information through a questionnaire and conducts a study of the questions. Our statistical questionnaire is aimed at enterprises in Hainan Province, China. At the same time, 2 questionnaires were prepared to collect data. On the basis of collecting and sorting out the data, the statistical analysis is carried out to verify the 2 hypotheses proposed in this paper. A total of 3,500 company questionnaires and employee questionnaires were distributed. Among them, some enterprises and employees have default values and outliers in the indicators, which are eliminated and sorted. In the end, 2980 valid questionnaires were obtained. Using the data obtained from the questionnaire, this paper conducts a large sample empirical study on the impact of enterprise management efficiency scores on enterprise human capital accumulation from the labor level. The benchmark regression results show that the management efficiency score has a significant promoting effect on the human capital accumulation of enterprises. Enterprises with higher management efficiency scores have more staff communication frequency, longer reading and learning time, more professional skills training and physical exercise.

Keywords: Enterprise management, Human capital, Management efficiency, Statistical research

Introduction

Human capital refers to the sum of knowledge, skills, physical strength (health status) and other quality factors with economic value that exist in the human body. Schultz (1959) and Becker (1962) first established a relatively complete theory of human capital. This theory has 2 core points: First, in economic growth, the role of human capital is greater than that of material capital; Second, the core of human capital is to improve the quality of population, and education investment is the main part of human investment.

Hardjanto (2002) said that Human capital has greater value-added space than hard capital such as material and currency. Especially in the post-industrial period and the early stage of knowledge economy, human capital will have greater value-added potential. As a "living capital", human capital is innovative and creative, and has the ability to effectively allocate resources, adjust enterprise development strategies and other market contingencies. Investment in human capital has a higher contribution rate to GDP growth.

The earliest human capital thought can be traced back to the works of Plato, an ancient Greek thinker. In his famous republic, he discussed the economic value of education and training. The first economist who regarded human resources as capital was Adam Smith, the originator of economics. On the basis of affirming the value created by labor and the special position of labor in various resources, Adam Smith, a generation of master of economics, clearly proposed that the proficiency of labor skills and the strength of judgment ability must restrict human labor ability and level, and the proficiency of labor skills can only be improved through education and training, Education and training need to spend time and pay tuition fees. This can be considered as the embryonic idea of human capital investment.

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Mueller also inherited some ideas from Smith. Mueller believed that skills and knowledge were important factors that had an important impact on labor productivity. He emphasized that the ability to acquire should be regarded as a part of national wealth, like machines and tools. Mueller's creative argument is: starting from the productive orientation of traditional economic growth and resource allocation, he points out that education expenditure will bring greater national wealth. Although some of the views of the French economist Sai were severely criticized by Marx, he was also one of the economists who put forward the idea of human capital (Chu, 2022). Chen and Zhang (2023) believes that the sum of the expenses spent on education and training is called "accumulated capital". The work remuneration of the educated and trained people should not only include the general wages of labor, but also include the interest of the capital paid for training, because the expenditure on education and training is capital. In particular, his idea that scientific knowledge is a part of productive forces is undoubtedly an epoch-making theoretical contribution. Marshall, the master of classical economics and the famous British economist at the end of the 19th century, also proposed that knowledge and organization are important components of capital and the most powerful productive forces. In further research, Marshall pointed out that knowledge and organization are independent production factors, and he believed that education investment plays an important role in economic growth.

Theodore W. Schultz, the winner of the 1979 Nobel Prize in Economics, systematically elaborated the theory of human capital in his speech at the 1960 American Economic Annual Conference. Before that, Fisher put forward the concept of human capital for the first time in the article "The Nature and Income of Capital" published in 1906, and incorporated it into the theoretical framework of economic analysis. At the same time as Schultz and later, Becker, Minsell, Dennison and others made outstanding contributions to the theory of human capital. They discussed human capital from different angles. Schultz's greatest contribution to human capital is that he first systematically put forward the theory of human capital and broke through many obstacles to make it a new branch of economics. Schultz also further studied the ways and means of human capital formation, and made a quantitative study on the return rate of education investment and the contribution of education to economic growth. Therefore, Schultz is called "the father of human capital".

Human capital theory, as a branch of economics, has been formed and developed. Applying it to the micro enterprise level, especially in combination with the reform of China's state-owned enterprises, will prevent the loss of state-owned assets, solve problems such as the state owner's virtual, insider control of state-owned enterprises during the transition period, encourage enterprise employees, and ultimately form a more perfect corporate governance structure.

Yang and Hou (2019) once pointed out that relevant theories have confirmed that the essence of an enterprise is actually an "incomplete contract" composed of non-human capital and human capital. In the ownership of an enterprise, the property right of human capital plays a special role and plays a decisive role. In fact, human capital operation refers to the operation and management activities of an enterprise. For an enterprise, it needs to gradually build its human capital stock and specific technical structure through strategic investment, so as to coordinate, control, integrate, allocate and encourage the use of these specialized human capital with different functions and forms according to its own requirements and objectives, Finally, we can maximize the team output and organizational benefits .

Zeng and Wang (2020) once pointed out that China quickly integrated into the international production system and successfully participated in the division of global value chain based on its comparative advantages in labor, land, resources and other factors, becoming a world-class "manufacturing country" and "trading country". However, this trade development model driven by low cost and high input has led to the low-end embedding of China's manufacturing industry in the global value chain, Lack of continuous power and potential to continue to climb to the high value-added link of the value chain. Ibrahim (2022) pointed out that human capital reflects the quality level of workers, and is a comprehensive reflection of workers' knowledge, technology, health and ability. Human capital has obvious externalities. It promotes knowledge spillover through mutual communication and frequent interaction among workers, and improves the overall production efficiency of workers and the R&D efficiency of enterprises. Cheng and Gao (2020) pointed out that the importance of human capital for

enterprises has been rising. However, due to the low quality of basic education in China, the investment of enterprises in human capital for employees is particularly important. In addition, due to the impact of the epidemic in recent years, China's economic development is not optimistic, which also affects the value of China's human capital. In this case, the enterprise's management of human capital is particularly important. Ji (2020) pointed out that a survey shows that 35 % of China's state-owned enterprises have very low human capital investment, and only perfunctorily pay for staff training and education funds. In order to meet the needs of maximizing benefits, many enterprises even ignore the importance of employee training and choose to give up human capital investment. Chinese companies have developed a deeper understanding of the importance of human capital, but nowadays there is still a lack of systematic theoretical support.

Methodology

Model analysis

Conceptual framework

Management refers to the process of effectively planning, organizing, leading and controlling the resources owned by the organization to achieve the established organizational goals under the specific internal and external environment of the organization. For enterprise management, we can make the following explanations: Enterprise management exists in enterprises, serves to achieve enterprise goals, and is a conscious and purposeful process; The process of enterprise management is composed of a series of interrelated and continuous activities, including planning, organization, leadership and control, which are the basic functions of enterprise management; Enterprise management should comprehensively use all kinds of resources in the organization to achieve the objectives of the organization. Management emphasizes both effectiveness and efficiency; Enterprise management is carried out under certain environmental conditions, which provides both opportunities and threats. Effective management must fully consider the specific conditions inside and outside the organization.

In the internet era, more and more enterprises are moving towards platform organizations. As the most important factor of production, "people" need to be brought into play, rather than become victims of zero-sum games. Therefore, human capital has become the fundamental source of competitive advantage In the Internet era, as a factor of production, the importance of "human" has risen sharply compared with that of the industrial economy era, and has really become the most uncertain one of all factors of production. It can not only create great value increment, but also lead to enterprise failure. In such a situation, more and more enterprises are bound to move towards platform organizations. To maximize the value of human resources, we need to manage the human capital of enterprises. We need to invest in the human capital of enterprises, operate human resources as capital, and produce business results.

From this point of view, human capital is also a kind of resource, and only by effectively planning, organizing, leading and controlling the resources can the enterprise management achieve its goals better. Therefore, the enterprise management ability must have a certain impact on human capital. This paper collects data through questionnaires and conducts regression analysis on the data, thus obtaining the impact of enterprise management ability on human capital.

To better illustrate the relationship between the interpreted variable and the dependent variables in this study, I plotted **Figure 1** to show the concept framework.

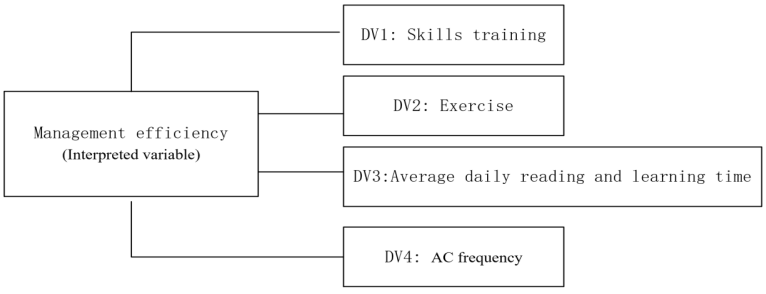

Figure 1 Concept framework.

In addition to this in order to better complete the research in this paper, 2 hypotheses are proposed.

Hypothesis 1: Positive correlation between enterprise management efficiency and enterprise human capital accumulation.

Hypothesis 2: Enterprise management efficiency is positively related to Education level of employees.

Model design

This article was prompted by Cheng and Gao (2020), in her article "Analysis of the Effect of Enterprise Management Ability on Employee Human Capital", this paper measures the accumulation of human capital in a company in terms of 4 variables: Frequency of employee communication, time spent reading and learning, whether they receive skills training and whether they exercise. This paper aims to test the effect of enterprise management ability on human capital through empirical analysis. Based on the cross-sectional nature of the survey data, respectively, in the test application of the relationship between management efficiency and human capital accumulation, the dual fixed effect OLS regression of control industries and regions is used as the basic model of empirical test. Through the above unobservable double fixed effect control, the problem of remaining variables can be better solved. The measurement model in this paper refers to the micro Mincer approach. After controlling the individual's education level and a series of other individual factors, the basic measurement model is set as follows:

$$communciation_{ijd} = \alpha + \beta management\_score_{ijd} + \gamma Z_{ijd} + D_j + D_d + \varepsilon_{ijd} \quad (1)$$

$$learning_{ijd} = \alpha + \beta management\_score_{ijd} + \gamma Z_{ijd} + D_j + D_d + \varepsilon_{ijd} \quad (2)$$

$$training_{ijd} = \alpha + \beta management\_score_{ijd} + \gamma Z_{ijd} + D_j + D_d + \varepsilon_{ijd} \quad (3)$$

$$physical_{ijd} = \alpha + \beta management\_score_{ijd} + \gamma Z_{ijd} + D_j + D_d + \varepsilon_{ijd} \quad (4)$$

Human capital

This paper comprehensively measures the human capital accumulation of enterprises from the 4 variables of employee communication frequency, reading and learning time, whether to receive skill training and whether to exercise. Among them, the subscripts i, j and d of the 4 explained variables represent the human capital accumulation of the d region, j industry and i enterprise, respectively.

The result variable in formula (1) is the employee communication frequency, which is used to measure the frequency of communication between employees and other people. This variable divides the employee communication frequency into four levels, namely: Frequent, sometimes, rarely, and basically not.

The result variable in formula (2) is the reading and learning time of employees, which is used to measure the length of reading and learning of employees every day. Reading and learning are one of the important ways for employees to accumulate human capital in the enterprise. Therefore, enterprise management can promote the length of reading and learning of employees to a certain extent, and thus enhance the accumulation of human capital in enterprises.

The result variable in formula (3) is whether the employee has participated in training. This variable is a dummy variable (0 - 1), which represents whether the employee has received enterprise training outside the formal school education. The existing research shows that a considerable part of the human capital accumulation within the enterprise is achieved in the form of training and on-the-job learning, so this paper uses the indicator "whether to train" to measure the human capital accumulation of the enterprise.

The result variable in formula (4) is whether the employee exercises (physical). This variable is a dummy variable (0 - 1), representing whether the employee exercises every week. Mushkin (1962) formally proposed to include health as a component of human capital, so this paper chooses the variable "whether to exercise" to measure the accumulation of healthy human capital in enterprises.

Management efficiency score

The key explanatory variable on the right side of the regression formula is the enterprise management efficiency score (management_score). The closer the management efficiency score is to "1", the better the enterprise's management ability. The closer the management efficiency score is to "0", the worse the enterprise's management ability. As shown in **Table 1** on the following page, the average enterprise management efficiency score is 0.60, the lowest enterprise management efficiency score is 0.05, and the highest enterprise management efficiency score is 1. For better descriptive statistics, this paper takes the median value of 0.60 of management efficiency score as the basis for dividing high and low management efficiency groups, and finally forms high management efficiency (ms = 1) and low management efficiency (ms = 0) groups.

When measuring the score of enterprise management efficiency, this paper first refers to the practice of Bloom and Van (2010), The management score is the unweighted average of the score for each of the 16 questions, where each question is first normalized to be on a 0 - 1 scale. The sample is all MOPS observations with at least 11 non-missingresponses to management questions and a successful match to ASM, which were also included in ASM tabulations, and have positive value added, positive employment and positive imputed capital in the ASM. Figuresare weighted using ASM weights and constructs enterprise management efficiency indicators based on the questionnaire data. Considering that management itself is a concept containing multiple dimensions, this paper focuses on the overall indicator of enterprise management efficiency. Therefore, the above method is used to measure the management efficiency score, and the specific situation of enterprise management in the four sub dimensions of goal planning, performance incentive, assessment and supervision, and management implementation is comprehensively reflected, so as to avoid potential interference to the empirical research conclusions due to the existence of missing variables, measurement errors and other problems. Using the standardized scale of WMS survey, the questionnaire effectively collected the management efficiency score of the enterprise dimension in 2020. The total effective sample is 361 enterprises, accounting for 91.4 % of the total sample (395 in total).

Other control variables

In the regression analysis part, this paper further controls the employee characteristics. The description of employee characteristics includes the noise control related to the management efficiency survey, so as to reduce the potential error in the enterprise management efficiency score (management score). The employee level control variables included in this paper include: Employee age, gender, marital status, education background, years of education, years of work in this industry, years of work in this position, wages at the beginning of the previous job and wages at the end of the previous job. At the same time, based on Bloom and Van (2010), it is considered to control other control variables that may affect enterprise productivity and enterprise human capital, such as industry type, enterprise fixed effect, etc. Therefore, this paper also supplements and controls these variables, namely firm fixed effect, industry fixed effect, county fixed effect and city fixed effect (see Eqs. (1) - (4)). These factors will have an impact on enterprise management ability and human capital accumulation. Descriptive statistics on employee base information variables are shown in **Table 1**. In the sample used in this paper, the average age of employees is 37 years old, the average education level of employees is high school, the average education level of employees is 19 years, the average employee has worked in this industry for 8 years, and the average employee has worked in this position for 15 years. Finally, this paper uses Stata software to consolidate the data related to enterprise questionnaires into the dimensions of employee data. To facilitate the portrayal of the effect of the main variables on the dependent variable, Statistical definitions were made for the main variables, as shown in **Table 2**.

Table 1 Variable type and name.

Variable Type	Variable name	Variable code
Interpreted variable	Whether to receive skill training	A1
	Whether to exercise	A2
	Average daily learning and reading time (hours)	A3
	Communication frequency	A4
Explanatory variable	Management efficiency score	B1
	Management Efficiency Grouping	B2
Control variable	Age	C1
	Gender	C2
	marital status	C3
	education	C4
	Years of education (years)	C5
	Working years in this industry (years)	C6
	Working years of this post (years)	C7
	Wage at the beginning of last job	C8
	Wage at the end of last job	C9

Table 2 Interpretation of the main variables.

		Statistical definitions	Variable code
Dependent variable	Whether or not to receive skills training	Yes = 1; No = 0	A1
	Whether to exercise or not	Yes = 1; No = 0	A2
	Average daily learning reading time (hour)	The amount of time employees spends each day reading and learning	A3
	AC frequency	Often = 4; Sometimes = 3; Seldom = 2; Hardly = 1	A4
Interpreted variable	Management efficiency score	Management Efficiency Score 2021	B1
	Manage efficiency groupings	High efficiency = 1; Inefficiency = 0	B2
Control variable	Age (years)	Employee age	C1
	Gender	Male = 0; Female = 1	C2
	Marital status	Have a spouse = 1; Unmarried = 2 Divorce = 3; Widowed = 4	C3
	Degree	Didn't go to school = 0; Elementary school = 1; Junior High = 2; High School = 3; Secondary = 4; College = 5, Bachelor = 6; Master = 7; PhD = 8	C4
	Years of education (years)	Years of education of the employee	C5
	Years of working experience in the industry (years)	Years in the industry	C6
	Years of work in this position (years)	Years of employment in this position	C7
	Salary at the beginning of the previous job	Salary at the beginning of the previous job	C8
	Salary at the end of the previous job	Salary at the end of the previous job	C9

Data collection

QN preparation

Whether it is the measurement of enterprise management efficiency or human capital, such data can only be directly investigated and there is not much open data. There are not many research results available on academic websites in China about the management ability of enterprises in Hainan Province and its impact on human capital. In view of this situation, this study mainly uses questionnaire survey to collect data.

The questionnaire used in this paper is based on the "China Enterprise Employee Matching Survey (CEES)" conducted in 2016, which was conducted by Wuhan University in conjunction with Hong Kong University of Science and Technology and the Chinese Academy of Social Sciences and other three academic institutions. CEES survey is based on the full sample data of enterprises in the economic census for random sampling, which is involved in enterprises of all sizes, so it can comprehensively reflect the profitability of enterprises.

Samples and sampling

In the sample enterprises, employees are determined by random number sampling according to the employee roster. The questionnaire consists of 2 parts: The enterprise questionnaire and the employee questionnaire. This article is aimed at companies all from Hainan Province, China. The survey content of the enterprise questionnaire completely covers the basic data of the enterprise, including 175 indicators such as the basic information of the enterprise, training and management efficiency measurement. The survey content of employee questionnaire includes education background, professional skill training, communication ability, health status, etc. Among them, the indicators of some enterprises and employee samples have default values and outliers, which are eliminated and sorted out. According to this survey questionnaire, we obtained cross-sectional data that completely covered the enterprise management efficiency and human capital accumulation.

Data processing

This paper uses descriptive statistics, basic regression and group regression to analyze the questionnaire data based on first-hand enterprise employee survey information obtained from the questionnaire. The sorting of questionnaire data is to convert the questionnaire data into sectional data through Stata software, and fill the missing values with interpolation or elimination methods. The software used for basic regression analysis is also Stata. **Table 3** shows the data statistics results.

Table 3 Data statistics results.

Variable code	Sample	Mean	Standard deviation	Minimum	Maximum
A1	2831	0.3	0.46	0	1
A2	2908	0.58	0.5	0	1
A3	2338	0.59	0.63	0	14
A4	2920	3.65	0.86	1	4
B1	2772	0.6	0.14	0.04	1
B2	2908	0.58	0.47	0	1
C1	2975	36.87	9.52	18	69
C2	2564	0.46	0.48	0	1
C3	2920	1.22	0.51	1	4
C4	2919	3.51	1.53	0	8
C5	2740	18.83	5.46	0	22
C6	2616	8.36	7.21	0	48
C7	2268	3.28	2.98	1	14
C8	2480	2396.08	1957.16	0	26500
C9	2523	2825.47	2246.25	0	30650

Results and discussion

Descriptive statistics

Using the data obtained from the questionnaire, this paper conducts an empirical analysis on the impact of enterprise management efficiency on enterprise human capital accumulation in the labor dimension, mainly presenting some characteristic facts found in descriptive statistics.

Hypothesis 1: Positive correlation between enterprise management efficiency and enterprise human capital accumulation

CEES provides data to measure the human capital of enterprises. In this part, employees' reading and learning time, communication frequency, whether to train and whether to exercise are used as proxy variables to measure the human capital accumulation of enterprises. **Figures 2 - 5** show the relationship between the two groups of high (ms = 1) and low (ms = 0) enterprise management efficiency and each explanatory variable.

From **Figures 2 - 5** on the next page, it can be clearly seen that the indicators of enterprises with high management efficiency scores are obviously better than those of enterprises with low management efficiency scores. There are significant differences between the 2. As shown in **Figure 2**, compared with enterprises with low management efficiency scores, enterprises with high management efficiency scores have 12 percentage points higher reading and learning time than enterprises with low management efficiency scores. At the same time, when the employee communication frequency is divided into low communication frequency (basically no communication and little communication) and high communication frequency (sometimes and often), **Figure 5** shows that 87.21 % of the employees in the enterprises with high management efficiency groups have a higher communication frequency, which is higher than that in the enterprises with low management efficiency groups. In addition, the proportion of employees in enterprises with high management efficiency who have received training and insisted on training is 30.01 and 57.63 %, respectively, 4.09 and 4.29 % higher than that in enterprises with low management efficiency. The results basically show that enterprises with high management efficiency scores have better human capital accumulation. These trends have preliminarily proved that there is a positive correlation between management efficiency and enterprise human capital accumulation, and higher enterprise management efficiency will bring better human capital accumulation.

It can be seen that enterprises with higher management efficiency scores tend to recruit employees with better human capital accumulation.

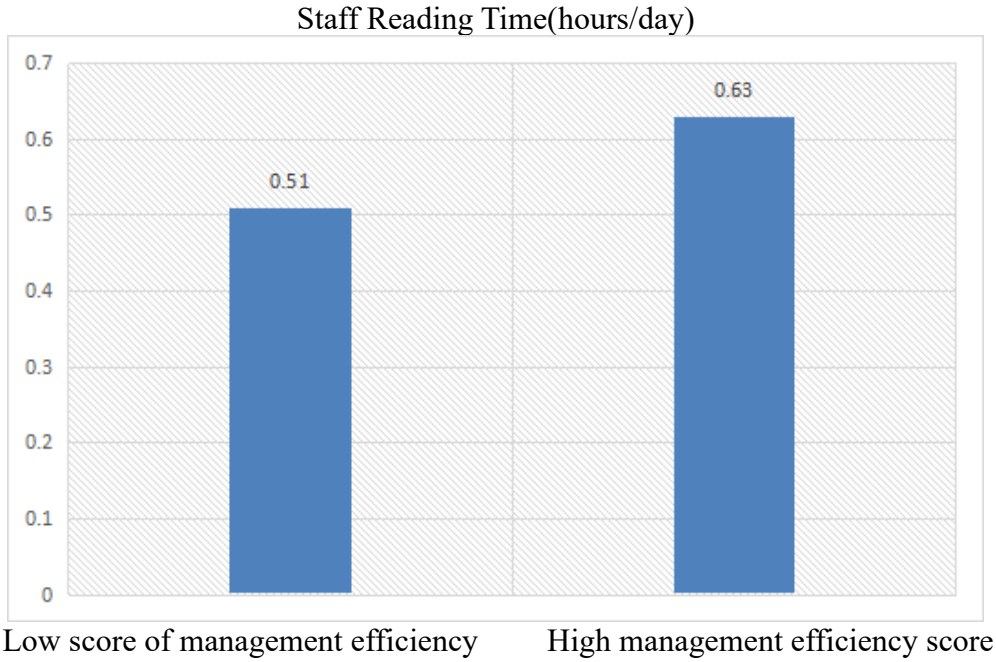

Figure 2 Grouping of management efficiency and reading learning time Staff Reading Time (hours/day).

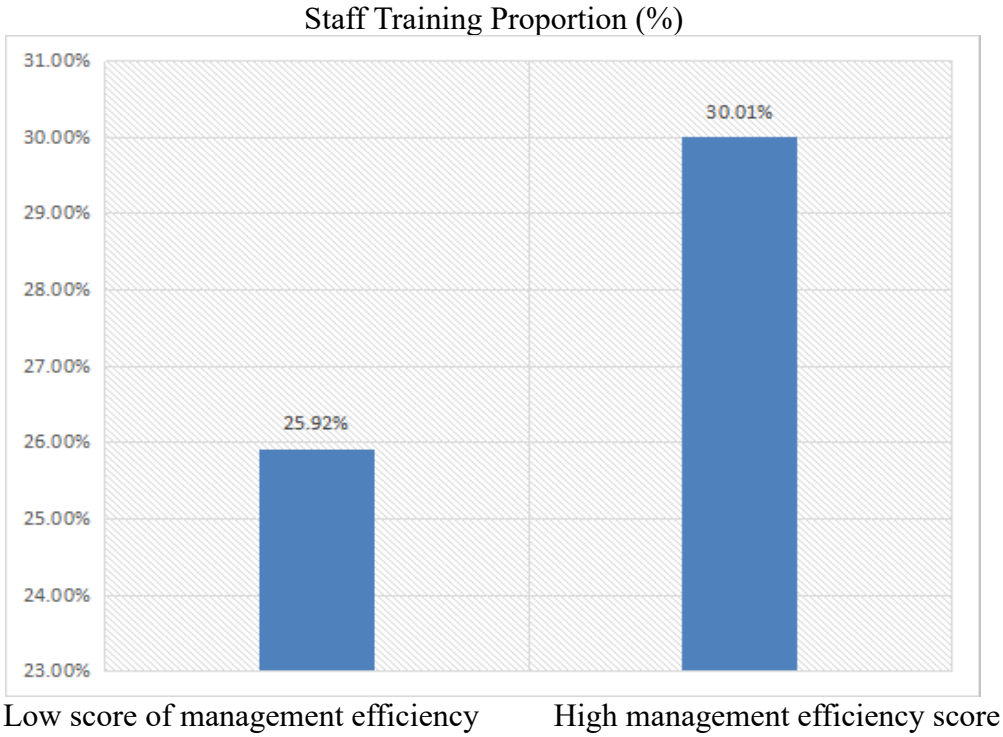

Figure 3 Management efficiency grouping and training ratio.

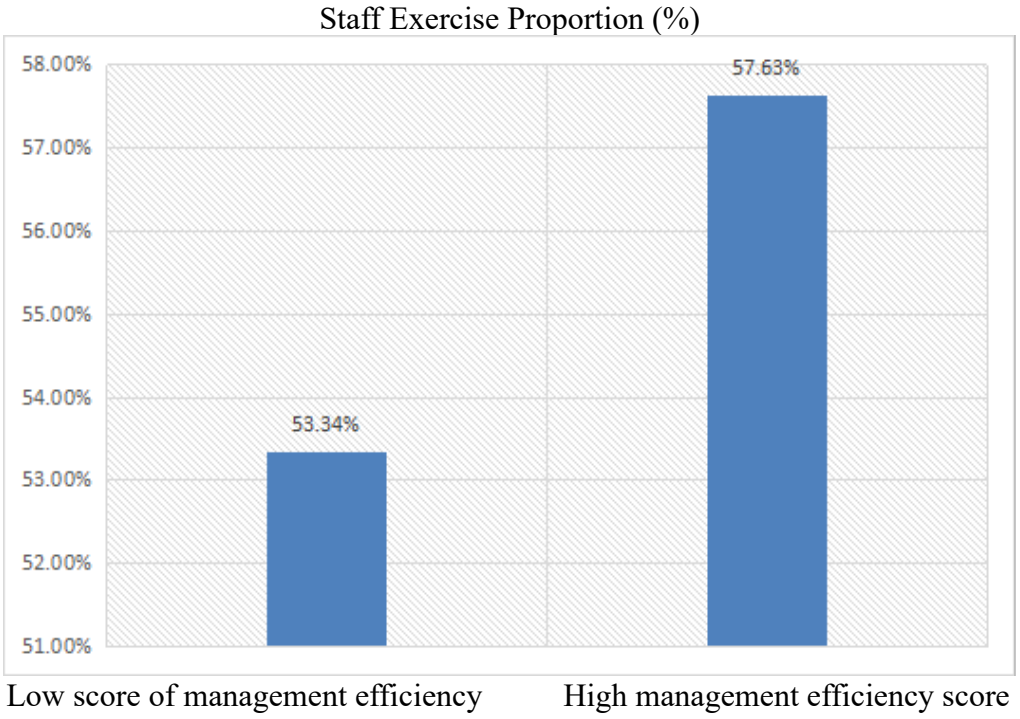

Figure 4 Management efficiency grouping and exercise proportion.

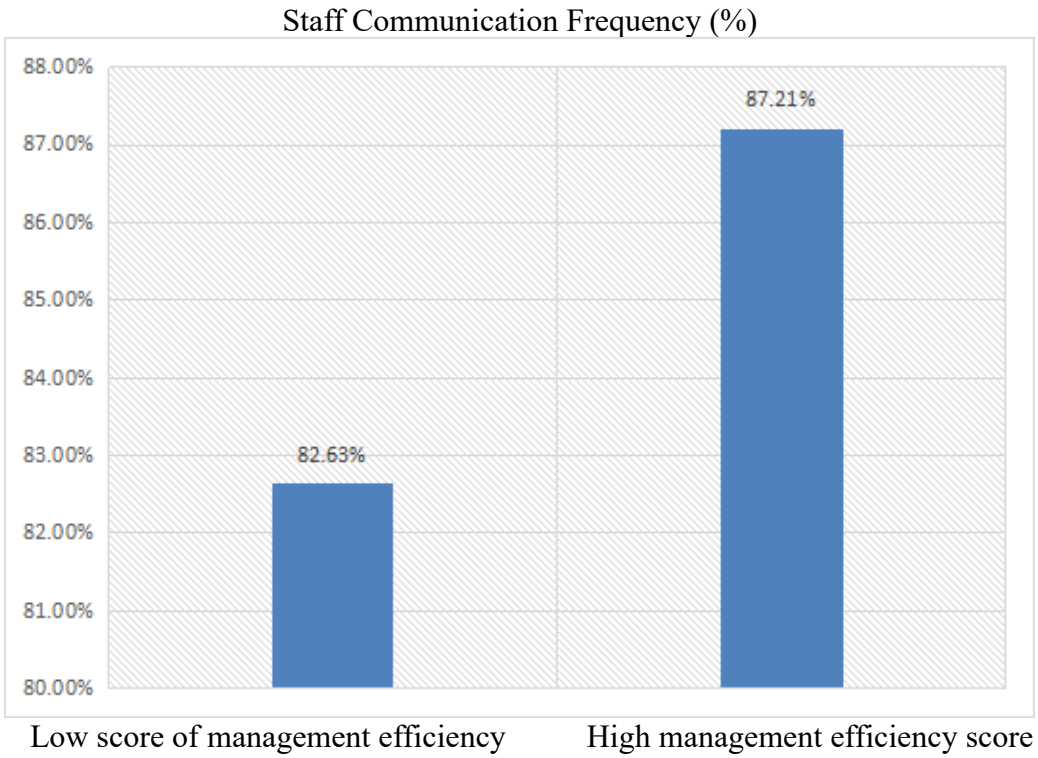

Figure 5 Communication frequency between high and low management efficiency groups and employees.

Hypothesis 2: Enterprise management efficiency is positively related to Education level of employees.

Figures 6 and **7** describe the relationship between the 2 groups of high management efficiency (ms = 1) and low management efficiency (ms = 0) and the education level and years of education of employees. It can be seen that employees with high management efficiency scores, regardless of their education level or years of education, are higher than those with low management efficiency scores. After dividing the education level of employees into groups of high education (bachelor degree or above) and low education (bachelor degree or below), as shown in **Figure 5**, the proportion of highly educated employees in enterprises with high management efficiency is 36.41 %, which is significantly higher than that in enterprises with low management efficiency. **Figure 7** shows that the average length of schooling of employees in the group of high management efficiency is 12 years, which is one year higher than that of employees in the group of low management efficiency. The above analysis results show that enterprises with high management efficiency scores do have better human capital accumulation, which may be because enterprises with high management efficiency scores are more inclined to recruit and choose employees with higher education and better human capital.

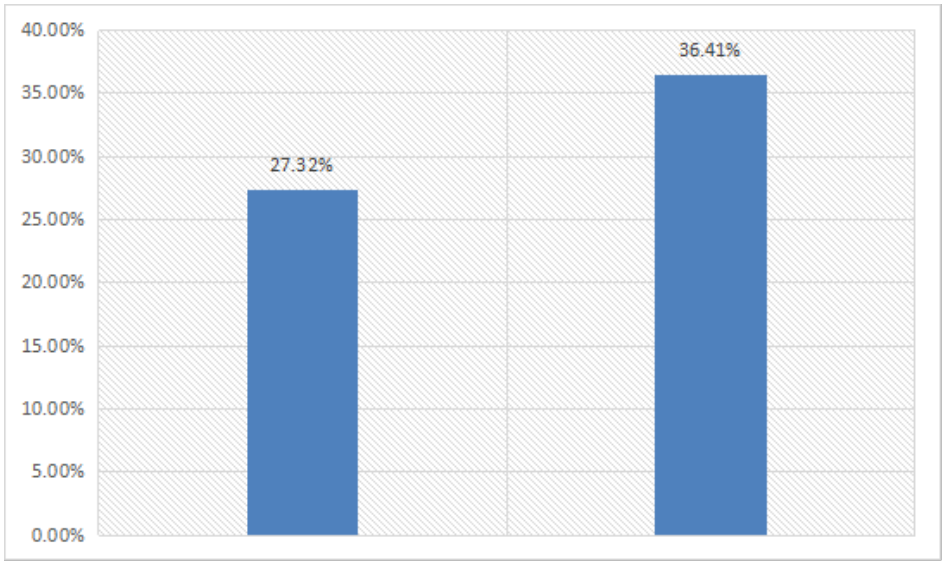

Figure 6 Grouping of management efficiency and education level.

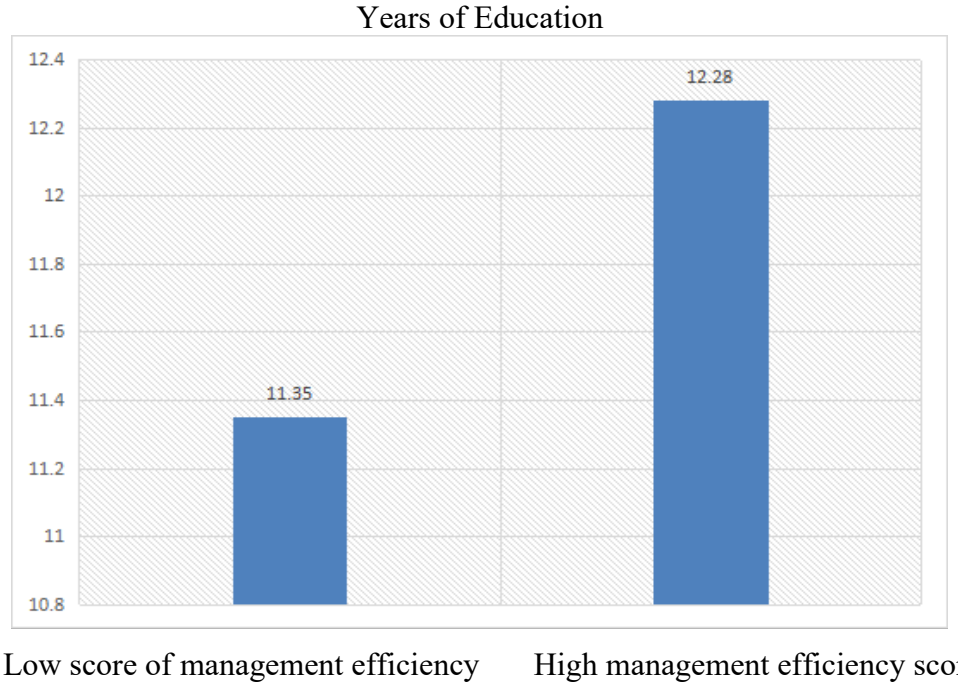

Figure 7 Grouping of Management Efficiency and Years of Education.

Basic regression

The benchmark regression results are shown in **Tables 4** and **5**. The core explanatory variables from Columns (1) to (4) are the continuous variables of enterprise management efficiency score. It can be seen from the regression results that when no control variable is added, the enterprises with high management efficiency scores are 69 % higher than those with low management efficiency scores in terms of employee communication frequency on average, and the impact coefficient is positive at the significance level of 1 %. When the employee characteristic variables such as age, gender, marital status, education background, years of education and years of work in the industry are controlled, this difference has decreased to a certain extent, but on average, the enterprises with high management efficiency scores are still 46 % higher than those with low management efficiency scores. From the perspective of control variables of employee characteristics, employees with longer education years and longer working hours in the industry have higher communication frequency, so the human capital accumulation is better. At the

same time, there is a negative correlation between employees' age and communication frequency. The younger the employees are, the better they are at communicating with others.

When the dependent variable is employee reading learning time, the regression results are similar. As shown in **Table 4**, when no control variable is added, the enterprises with high management efficiency scores are 45 % higher than the enterprises with low management efficiency scores in terms of employee reading and learning time on average, and the impact coefficient is positive at the significance level of 1 %. When employee characteristic variables such as employee age, gender, marital status, education background, years of education and years of work in the industry are controlled, this difference also decreases to a certain extent, but the enterprises with high management efficiency scores are still 37 % higher than those with low management efficiency scores on average. From the perspective of the control variables of employee characteristics, the longer the education years and the longer the working time of the employee, the longer the reading and learning time.

Table 4 OLS estimation results of management efficiency and communication frequency.

Variable	Communication Frequency			
	(1)	**(2)**	**(3)**	**(4)**
Management efficiency	0.69** (0.07)	0.46*** (0.07)	0.56*** (0.07)	0.55*** (0.07)
Age		−0.007*** (0.002)		
Female sex		−0.03 (0.03)		
Married		0.04 (0.03)		
Years of education		0.01*** (0.004)		
Working hours of this position		0.005* (0.002)		
Working hours in this industry		0.002 (0.002)		
Wage at the end of last job		0.01 (0.02)		
Wage at the beginning of last job		−0.007 (0.02)		
Industry fixed effect			Y	
Regional fixed effect				Y
Observations	2782	1424	2754	2782
R^2	0.013	0.061	0.024	0.296

Note: Heteroscedasticity robust standard error is shown in brackets. * means significant at 10 % level, * * means significant at 5 % level, and * * * means significant at 1 % level.

Table 5 OLS estimation results of management efficiency and reading learning.

Variable	Reading Learning			
	(5)	**(6)**	**(7)**	**(8)**
Management efficiency	0.45*** (0.06)	0.37*** (0.06)	0.39*** (0.06)	0.39*** (0.06)
Age		−0.004* (0.002)		
Female sex		−0.03 (0.03)		
Married		0.001 (0.024)		
Years of education		0.008*** (0.003)		
Working hours of this position		0.002 (0.002)		
Working hours in this industry		0.001 (0.002)		
Wage at the end of last job		−0.04* (0.02)		
Wage at the beginning of last job		0.03* (0.02)		
Industry fixed effect			Y	
Regional fixed effect				Y
Observations	2230	1144	2208	2230
R^2	0.008	0.011	0.013	0.019

Note: Heteroscedasticity robust standard error is shown in brackets. * means significant at 10 % level, * * means significant at 5 % level, and * * * means significant at 1 % level.

As shown in columns (1) and (2) of **Table 6**, the dependent variable is the dummy variable of whether employees are trained. When no control variable is added, the enterprises with high management efficiency scores are 53 % higher than those with low management efficiency scores in terms of employee training on average, and the impact coefficient is positive at the significance level of 1 %. When employee characteristic variables such as employee age, gender, marital status, education background, years of education and years of work in the industry are controlled, the enterprises with high management efficiency scores are still 31 % higher than those with low management efficiency scores on average, which means that the omission of these variables will not cause large errors in the regression estimation of employee training. From the perspective of the control variables of employee characteristics, employees with longer education years and longer working hours in the industry are more likely to have received training.

Finally, as shown in **Table 7**, when the dependent variable is whether employees exercise, and after controlling employee characteristics variables such as employee age, gender, marital status, educational background, years of education and years of work in the industry, compared with enterprises with low management efficiency scores, the average number of employees who insist on training decreases from 63 to 59 %, although the coefficient decreases to a certain extent, However, the influence coefficient is still positive at the significance level of 1 %. In addition, after controlling the industry fixed effect and regional fixed effect respectively, the regression result is still significant. The above regression results can

basically prove that the management ability of enterprises has a positive impact on the accumulation of human capital.

Table 6 OLS estimates of management efficiency and training.

Variable	Training			
	(1)	(2)	(3)	(4)
Management efficiency	0.53*** (0.08)	0.31*** (0.12)	0.41*** (0.08)	0.40*** (0.08)
Age		0.0007 (0.002)		
Female sex		−0.08* (0.03)		
Married		0.03 (0.03)		
Years of education		0.008 (0.004)		
Working hours of this position		−0.005 (0.004)		
Working hours in this industry		0.002 (0.003)		
Wage at the end of last job		−0.002 (0.05)		
Wage at the beginning of last job		−0.01 (0.02)		
Industry fixed effect			Y	
Regional fixed effect				Y
Observations	3326	1630	3296	3326
R^2	0.002	0.002	0.011	0.012

Note: Heteroscedasticity robust standard error is shown in brackets. * means significant at 10 % level, * * means significant at 5 % level, and * * * means significant at 1 % level.

Table 7 OLS estimation of management efficiency and exercise.

Variable	Exercise			
	(5)	(6)	(7)	(8)
Management efficiency	0.63*** (0.09)	0.59*** (0.12)	0.47*** (0.09)	0.50*** (0.09)
Age		−0.001 (0.003)		
Female sex		−0.21*** (0.03)		
Married		−0.01 (0.031)		
Years of education		0.008* (0.004)		
Working hours of this position		−0.001 (0.004)		
Working hours in this industry		0.007* (0.004)		
Wage at the end of last job		0.002 (0.03)		

Variable	Exercise			
	(5)	(6)	(7)	(8)
Wage at the beginning of last job		0.0009 (0.02)		
Industry fixed effect			Y	
Regional fixed effect				Y
Observations	2772	1421	2743	2772
R^2	0.003	0.009	0.014	0.013

Note: Heteroscedasticity robust standard error is shown in brackets. * means significant at 10 % level, * * means significant at 5 % level, and * * * means significant at 1 % level.

Conclusions

Summary

Using the data obtained from the questionnaire, this paper conducts a large sample empirical study on the impact of enterprise management efficiency scores on enterprise human capital accumulation from the labor level. The benchmark regression results show that the management efficiency score has a significant promoting effect on the human capital accumulation of enterprises. Enterprises with higher management efficiency scores have more staff communication frequency, longer reading and learning time, more professional skills training and physical exercise. This shows that, for Chinese enterprises at this stage, by improving their management ability, they can obtain individual human capital returns of employees, thus improving the overall human capital accumulation of enterprises.

Suggestions and recommendations

Now the world is in a great change that has not happened in a century. In such a complex market economy environment, human capital has become an important indicator to measure the success of an enterprise. The key for enterprises to maximize profits is to improve the accumulation of human capital. Through the data obtained from the questionnaire, this paper draws a conclusion that the score of management efficiency has a significant promoting effect on the human capital accumulation of enterprises. How to improve the survival period of enterprises, how to improve the production efficiency of enterprises, how to make Chinese enterprises further move towards a more open international market, and how to improve enterprise management efficiency and human capital accumulation are particularly important.

For the efficiency of enterprise management, we can formulate standardized management processes to ensure the seamless operation between departments, and reduce the wrangling, waiting and going their own way due to unclear and incomplete management standards; A flat organizational structure can be adopted, which evolves from a functional and centralized organizational structure to a business division system, a decentralized system, and a cooperative partnership system, reducing levels and communication costs; Try to change the organizational relationship as much as possible, from the traditional employment relationship to the partnership relationship, so as to realize the transformation of the role of manager to operator, thus intensifying the internal vitality; Cultivate the team cooperation spirit of employees, change the individual combat mode into the team cooperation mode, and cultivate the team's rule awareness and cooperation spirit; The most important thing is to do a good job in the prevention of miscellaneous management processes. The more the process systems are, the better. Management should pursue simplicity on the basis of internal control, and management should also prevent miscellaneous to improve efficiency.

As far as human capital accumulation is concerned, we can help employees get to know each other through department cooperation tasks, so as to improve their communication frequency. You can recommend books to employees to improve their reading and learning time. At the same time, enterprises should increase the investment in human capital and tilt the funds to a certain extent for employee

training. At the same time, enterprises should set up gyms for employees to exercise, so as to improve human capital in multiple dimensions.

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