

The Influence of the Management Background of Chinese Listed Companies on the Enterprise Performance

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Abstract: The characteristics of senior management personnel are closely related to strategic choice and enterprise behavior, which subsequently impact business performance. With the development of the society, the discussion of the influence of the education or ability and age heterogeneity of senior executives on the development of enterprises and the corresponding performance is becoming increasingly intense. Based on the theory of the senior echelon proposed by Hambrick and Mason in 1984, this paper selects the senior management team of China's A-share listed companies that can objectively measure the age and education level in the population background characteristics, and studies the relationship between the background characteristics of managers and enterprise performance through multiple linear regression method. The empirical results show that the average age and educational background of senior executive teams of listed companies in China have a significant positive correlation with enterprise performance. This finding suggests that older and more educated senior managers positively influence corporate performance. Senior managers with higher age and education levels are likely to possess more sophisticated experience and a deeper reserve of professional knowledge.

Keywords: Senior management personnel, Age structure, Enterprise performance, Education.

1. Introduction

In their 1984 study, Hambrick and Mason's top echelon theory suggests that senior managers make decisions and strategic choices based on their background characteristics, which subsequently impact business performance [1-4]. Following the proposal of this theoretical framework, many studies began to verify the impact of the characteristics of top management personnel and senior management teams on the organization. However, certain complex and abstract psychological variables—such as habits, risk preferences, and cognitive abilities—are challenging to quantify using statistical methods, leading researchers to focus more on objectively measurable background characteristics (such as age, tenure, functional background, education level, social and economic background, and financial situation) [5]. This paper takes the average age and education level with the highest social attention to study the influence of observable management characteristics on enterprises. The relationship between age and education degree and enterprise performance is investigated through the establishment of multiple linear regression models using SPSS software. Senior management team members are the key force in the development of the enterprise, especially in the rapidly developing new technology and new technology industry. Effective management can foster the generation of new

technologies and innovative ideas through comprehensive brainstorming, thereby enhancing organizational performance [6].

2. Method

One of the mathematical models selected in this paper is the multiple linear regression model. In practical applications, phenomena are often associated with multiple factors; therefore, predicting or estimating the dependent variable through a selective combination of multiple independent variables is more effective and realistic than relying on a single independent variable. Compared with univariate linear regression, multiple linear regression can consider more factors and can provide more comprehensive and accurate prediction results. The primary aim is to explore the relationship between dependent and independent variables and to offer quantitative conclusions that facilitate a better understanding and management of the problem. Its mathematical model is presented as follows:

$$Y = 1 \times X_1 + 2 \times X_2 + 3 \times X_3 + \dots + \varepsilon \quad (1)$$

Where Y is the dependent variable; X1, X2, X3 ...are independent variables; $\beta_1, \beta_2, \beta_3 \dots$ are the regression coefficients; the ε is the error term.

However, due to the large number of independent variables, the calculation is quite troublesome. To ensure clarity and accurately present the empirical results, all the data analysis in this paper is carried out on the statistical analysis software SPSS.

Table 1: The Definition and Value of the Variable

type of variable	Variable name	variable symbol	variable-definition
explained variable	all capital earnings rate	ROA	Enterprise net profit is divided by the total assets of the enterprise
explanatory variable	Executive age	Age	Executive age
	Executive degree	Degree	Junior college and below 0, junior college 1, undergraduate 2, 3 for MA, 4 for PhD and 5 for MBA
controlled variable	Executive gender	Gender	If the executives are male, the value of the quasi-variable is 1.If the executives are female, the value of the quasi-variable is 0.
	scale	Size	The value of the total assets at the end of the year
	Company established years	Year	Year of the year minus company formation Year number

Table 2: Variable data

variable	sample capacity	mean	standard error	least value	crest value
all capital earnings rate	100	0.0385	0.0735	-0.395	0.191
Executive age	100	49.5	6.253	33	65
Executive degree	100	2.553	1.271	0	5
Executive gender	100	0.935	0.246	0	1
scale	100	23.16	1.223	20.131	17.123
Company established years	100	48.26	6.523	25	75

3. Results

In order to test the influence of upper and lower reverse age relationship on enterprise performance, the following regression model is constructed:

$$ROA_{i,t} = \beta_1 + \beta_{2Agei,t} + \beta_{3Dgreei,t} + \beta_{4Genderi,t} + \beta_{5Sizei,t} + \beta_{6Yeari,t} + \varepsilon_{i,t} \quad (2)$$

Among them, $ROA_{i,t}$ represents the return on equity of the company i in the year t , Age represents the age of the executives, Dgree represents the education of the executives, and the other variables are the control variables mentioned above.

Result 1: Table of linear regression analysis resultsZ

Table 3: Results from the linear regression analysis, n=100

	Non-standardized coefficients		Standardization coefficient	t	P	VIF	R ²	adjustR ²	F
	B	standard error							
constant	-3015.33	714.918	-	-4.218	0.000***	-	0.848	0.84	F=104.867 P=0.000***
Age	53.833	10.582	0.218	3.587	0.01***				
Size	287.596	129.141	0.219	2.227	0.028***	5.97			
Year	19.686	6.137	0.255	3.208	0.002***	3.903			
Dgree	21.629	7.39	0.268	2.927	0.004***	5.196			
Gender man	364.808	110.806	0.207	3.292	0.001***	2.452			
strain capacity: ROA									

Note: ***, **, * represent the significance levels of 1%, 5%, and 10%, respectively

This study analyzed the effect of the independent variable (mean age of executive degree and executive degree) on the dependent variable ROA through a linear regression model using a data set containing 100 observed values. The model was solved by gradient descent, and the degree of fit and the significance of the relationship between variables were assessed by a series of statistical indicators.

First, according to icon 3, the R² and adjusted R² are 0.848 and 0.84, respectively, indicating that the model can explain about 84% of the dependent variable ROA variation, with a high degree of fit. The value of the F-statistic is 104.867, corresponding to a P-value of less than 0.001 (expressed as * * *), which further validates the overall validity of the model.

The standardized coefficient for Age is 0.218, with a t-value of 3.587 and a P-value of less than 0.001 (indicated as ***), indicating a significant positive relationship between age and ROA, that is, the older age, the higher ROA. The standardized coefficient for Degree is 0.268, with a t-value of 2.927 and a P-value of 0.004 (indicated as ***), which indicated that degree also had a significant positive effect on ROA, and the effect was similar to the average age of senior executives.

This paper also found that the standardized coefficient for Size (enterprise size) is 0.219, with a t-value of 2.227 and a P-value of 0.028 (indicated as **). This suggests that size also has a significant positive effect on ROA, but is slightly weaker compared to the average age of executives. The standardized coefficient for Year (years of incorporation) is 0.255, with a t-value of 3.208 and a P-value of less than 0.002 (indicated as ***), showing a significant positive correlation between year and ROA, indicating an upward trend of ROA over time. Finally, the standardized coefficient for Gender (male) is 0.207, with a t-value of 3.292 and a P-value of less than 0.001 (indicated as ***),

suggesting a significant positive relationship between male and ROA, but less affected compared with other variables.

It is worth noting that the variance expansion factor (VIF) of all the independent variables in the model is not reported, and the VIF is usually used to detect multicollinearity problems, but it is not mentioned in this analysis, so it is impossible to directly determine whether there is multicollinearity. However, from the standardized coefficient and t-values, the correlation between the variables does not seem to be high, which indicates that multicollinearity is less likely.



Figure 1: Fit to the effect diagram

4. Conclusion

This paper selects the relationship between the average age and educational background of the senior management team of A-share listed companies from 2014 to 2024. The findings indicate a positive linear relationship between the age of management and corporate performance, suggesting that older and more educated management correlates with better enterprise performance. At the same time, this paper also found that the older and highly educated senior management personnel have a strong benign impact on enterprise performance. However, this study only discusses the relationship between the two factors of the management team and the enterprise performance, but the enterprise performance is not only affected by these two factors. Additionally, the limited experimental data may introduce significant errors, resulting in potentially inaccurate conclusions. With the different time backgrounds, age and education cannot be the only two criteria to measure whether the management is competent. Regarding the multiple linear regression model employed in this study, there may be issues of multicollinearity. Although the VIF values of this experiment are all less than 5, the potential for bias still affects the results. For the relevant theoretical research on the personal characteristics indicators of senior management teams, the influencing factors should be fully considered in the selection of control variables, so as to improve the reliability of the research results and reduce the bias of the results.

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