

An Empirical Study on the Background Characteristics of Executives and Enterprise Investment Efficiency

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Abstract. The company's various decisions and investment behaviors are affected by the "company personality" factor. This paper selects the Shanghai-Shenzhen A-share listed companies from 2010 to 2016 as research samples, and empirically tests the relationship between management background characteristics and corporate investment efficiency. The study finds that gender differences in senior management are not significantly related to investment efficiency; the higher the average age of senior management team is, the lower the level of investment in large and non-efficiency is; the higher the level of education of the senior management team is, the lower the level of non-efficiency investment is. The study can enrich relevant research literature and provide empirical evidence from transition countries.

1. Question Raised

Hambrick and Mason (1984) pointed out that when studying the operation of a company, the personal characteristics of senior managers cannot be ignored, because the company's strategic behavior reflects the characteristics of decision makers to a certain extent, and the manager's background characteristics will affect the relevant major decisions made by the company. [1]. Through literature review, it is found that there are few literatures that focus on the background characteristics of managers to study investment decisions and efficiency. However, it is precisely because of the different personal characteristics of managers that their behavior choices are different. What is the relationship between the background characteristics of executives and the efficiency of corporate investment? It is worth exploring.

This paper attempts to draw on the relevant research results of domestic and foreign scholars, select Shanghai-Shenzhen A-share listed companies as samples, examine the relationship between the background characteristics of the management and the investment efficiency of enterprises through empirical research in the 2010-2016 inspection period, and answer the following questions: first, do more males in the executive team mean higher level of non-efficiency investment? second, if the higher the average age of the executive team is, the lower the level of non-efficiency investment is? third, if the higher the level of education of the senior management team is, the lower the level of non-efficiency investment is? The incremental contribution of this paper is to analyze the impact of executive background, age, and background characteristics on investment efficiency, supplement the current academic literature on the factors affecting investment efficiency, and provide empirical evidence from countries in transition.

2. Theoretical Basis and Research Hypothesis

2.1. Theoretical Basis

Hambrick and Mason (1984) first proposed the "high-level ladder theory", arguing that senior managers will conduct highly personalized practices and choices for the specific organizations they face. Their behavior reflects their perceptions, values and unique characteristics of life experience; senior managers influence the process of an organization's implementation of strategy and influence the behavior of other members of the same organization. Hambrick (2007) [2] reviewed the initial background of the high-level ladder theory and emphasized the key to the entire management team

as the research object. He believes that future research on "higher level theory" needs to be considered more carefully, such as "executives" and the adjustability of variables like discretion and executive work requirements.

2.2. Research Hypothesis

Senior managements' personal background characteristics are embodied in the gender, age, education level, management level, management power, tenure and professional quality of executives. These characteristics can reflect the internal psychological characteristics of the manager's values, the ability to judge, risk preference and thinking mode, which will affect the decision-making process of the senior management team and the process of team organization. Finally, it affects the company's investment efficiency.

This paper selects gender, age and education level of senior executives as the substitutes of the background characteristics of senior management team to conduct specific research and to analyze its impact on the investment efficiency of enterprises.

The more male managers in a company's executives, the more non-efficient investments they will make, because male managers are generally more daring when making investment decisions, and they tend to increase investment and scale. When investment increases, the uncontrollable factors increase, so does the non-efficiency investment. Female executives tend to make more conservative and stable investment decisions, so inefficient investment levels will decrease. Therefore, the following assumptions are made:

Hypothesis 1: Limit other conditions, the larger the male team in the senior management team is, the higher the non-efficiency investment level is.

The influence of managerial age factors on investment behavior is mainly reflected in two aspects. First, as the age of senior executives increases, the corresponding experience becomes more and more abundant, and they will accumulate good social relations, so there are more reasonable judgments on different investment projects. Secondly, compared with young managers, although the older managers lack the spirit of innovation and adventure, their life experience will be more abundant, and they will pay more attention to the stability of future career development. Therefore, the older the senior executives are, the more rational the investment is. As a result, the following assumptions are made:

Hypothesis 2: Limit other conditions, the higher the average age of the executive team is, the lower the level of non-efficiency investment is.

The higher the degree of education of executives is, the more knowledge and insights they will have. The executives will integrate their academic standards and experience to make a long-term decision that is more conducive to business development, avoiding short-sighted and irrational investments. Therefore, the following assumptions are made:

Hypothesis 3: Limit other conditions, the higher the education level of the executive team is, the lower the level of non-efficiency investment is.

3. Research Design

3.1. Sample Selection and Data Source

This article takes the Shanghai and Shenzhen A-share listed companies as the research samples, and implements the following screening procedures: (1) Excluding ST and PT companies, because the financial status of such companies is abnormal to avoid bias in research results; (2) Excluding banks, insurance, etc. because the financial industry sample companies are quite different from other industries; (3) Excluding companies with missing data in 2010-2016 to ensure the continuity and integrity of the sample. After the above screening, 14206 valid observations were included in 2,570 sample companies. The data of the listed companies were from the Guotaian Database (CSMAR). The data processing was mainly completed by Excel2007 and stata14.0.

3.2. Variable Description

3.2.1. Manager Background Characteristics

This paper selects the gender, average age and average education level of senior managers as the substitute variables of the background characteristics of senior management team. Regarding the gender of managers, this paper defines male managers as 1 and female managers as 0; regarding the age of managers, this article is based on the average annual age of the company's executives; regarding the degree of education of managers, this article is based on the level of managerial qualifications, assigns the junior high school education level to 9, the secondary school and under the secondary school level is 12, the college assignment is 15, the undergraduate assignment is 16, the postgraduate assignment is 19, the Ph.D. candidate is assigned a value of 23, and then the average number of years of education for executives is calculated to measure the education level of the manager.

3.2.2. Investment Efficiency

Construct model 1 to measure investment efficiency. The definition of relevant symbols in model 1 is shown in Table 1.

$$Invest_{it} = a_0 + a_1 Cash_{it-1} + a_2 Growth_{it-1} + a_3 Lev_{it-1} + a_4 Size_{it-1} + a_5 Ret_{it-1} + a_6 Age_{it-1} + a_7 Invest_{it-1} + \varepsilon_{it} \quad (\text{Model 1})$$

Table 1. Model 1 Variable Types and Definitions

Variable Type	Meaning	Symbol	Variable Definition
Explained variables	new investment	inv	the difference between the cash paid for the purchase and construction of fixed assets, intangible assets and other long-term assets in the year t minus the cash received from disposal of fixed assets, intangible assets and other long-term assets, divided by Total assets at the beginning of the period.
	holding funds	lcash	last year (money funds + short-term investments) / total assets
Explanatory variables	growth capacity	lgro	growth rate of operating income in the previous year
	solvency	llev	total liabilities in the previous year / assets
	company size	lsize	the year-end asset logarithm of the previous year
	stock return	lret	stock returns in the previous year
	company age	lage	last year's company's listing period
	previous investment	linv	new investment in the previous year

In model 1, the residual value is greater than 0 for over-investment, and the residual value is less than 0 for under-investment.

3.3. Model Establishment

In order to empirically study the relationship between management background and investment efficiency, this paper selects the enterprise scale, free cash flow level, the largest shareholder shareholding ratio and total asset growth rate, industry and annual as control variables, and establishes the following three regression models. The symbols are defined in Table 2.

$$ainv = \alpha + \beta_1 mmale + \beta_2 size + \beta_3 fcf + \beta_4 top1 + \beta_5 gro + \lambda_i \sum ind + \eta_i \sum year + \varepsilon \quad (\text{M1})$$

$$ainv = \alpha + \beta_1 mage + \beta_2 size + \beta_3 fcf + \beta_4 top1 + \beta_5 gro + \lambda_i \sum ind + \eta_i \sum year + \varepsilon \quad (M2)$$

$$ainv = \alpha + \beta_1 medu + \beta_2 size + \beta_3 fcf + \beta_4 top1 + \beta_5 gro + \lambda_i \sum ind + \eta_i \sum year + \varepsilon \quad (M3)$$

Among them, model M1 test hypothesis one, model M2 test hypothesis two, model M3 is test hypothesis three.

Table 2. M1\M2\M3 Variable Types and Definitions

Variable Type	Meaning	Code	Description
Interpreted variable	investment efficiency	ainv	absolute value of residual
Interpret variable	executive gender	mmale	annual average gender
	executive age	mage	annual average age
	executive education level	medu	annual average years of education
Control variable	firm size	size	year-end asset logarithm
	free cash flow	fcf	operating cash flow / year-end assets
	equity concentration	top1	shareholding ratio of the largest shareholder
	growth capacity	gro	total asset growth rate
	industry	ind	17 industry definition 16 industry dummy variables
	year	year	ind 7 years defines 6 dummy variables

4. Empirical Analysis Results

4.1. Descriptive Statistical Analysis

Table 3. Descriptive statistics for M1\M2\M3

Variable	N	mean standard	deviation	minimum	maximum
ainv	14206	0.0419	0.0470	0.000532	0.270
mmale	14206	0.827	0.106	0.357	1
mage	14206	48.64	3.059	35.60	61.36
medu	13796	17.32	1.268	9	23
size	14206	21.97	1.155	19.65	25.31
fcf	14206	0.0399	0.0728	-0.191	0.240
top1	14206	0.352	0.151	0.0877	0.750
gro	14206	0.213	0.426	-0.252	3.089

Table 3 reports the descriptive statistical analysis results of the variables. The results show that the average investment efficiency of the sample company is 0.0419, of which the minimum value is 0.000532 and the maximum value is 0.270, indicating that the investment efficiency of different enterprises is quite different. The average gender of the senior management team is 0.827, indicating that Males account for a relatively large part in China companies. The average age of the senior management team is around 48 years old, among which the youngest is 35 years old, and the oldest is 61 years old, indicating that the age span and distribution of managers are quite different. The average education level of the senior management team is 17.32, of which the minimum is 9 and the maximum is 23. This indicates that there is a big difference in the education level of senior executives of different listed companies.

4.2. Regression Analysis

Regression analysis of the model. This paper uses the least squares regression model, while using the robust standard error to deal with heteroscedasticity, and joining the industry and annual dummy variables for regression. The results are shown in Table 4:

Table 4. M1\M2\M3 regression analysis

	-1	-2	-3
	M1	M2	M3
VARIABLES	ainv	ainv	ainv
mmale	0.00314		
	-0.872		
mage		-0.000527***	
		(-3.515)	
medu			-0.00123***
			(-3.940)
size	-0.00266***	-0.000488	-0.00241***
	(-6.958)	(-1.139)	(-6.375)
fcf	0.00448	-0.00639	0.0035
	-0.84	(-1.194)	-0.646
top1	0.000849	0.001	0.00181
	-0.333	-0.334	-0.701
gro	0.0339***	0.00103*	0.0346***
	-20.8	-1.939	-20.99
Constant	0.0934***	0.0829***	0.110***
	-11.24	-8.181	-11.74
Observations	14,206	14,206	13,796
R-squared	0.123	0.039	0.124
Industry	control	control	control
Year	control	control	control

Note: The T value is reported in parentheses, and ***, **, and * refer to the significance levels of 1%, 5%, and 10%, respectively.

Table 5 reports the regression analysis results of the relevant variables. The results show that there is no significant positive correlation between mmale and ainv in model M1 ($\beta=0.00314$, $p>0.1$), indicating that executive gender has no significant effect on non-efficiency investment, rejecting hypothesis 1. In model M2, mage is significantly negatively correlated with ainv ($\beta=-0.0005274$, $p<0.01$), indicating that the higher average age of the executive team is in line with the lower non-efficiency investment level, and hypothesis is verified. In model M3, medu is significantly negatively correlated with ainv ($\beta=-0.00123$, $p<0.01$), indicating that the higher the education level of the senior management team is in line with the lower non-efficiency investment level, Hypothesis 3 is verified.

5. Research Conclusions and Enlightenment

5.1. Research Conclusions

This paper takes Shanghai-Shenzhen A-share listed company as the research samples and 2010-2016 as the inspection period to empirically examine the relationship between management background characteristics and corporate investment efficiency. The study finds that: (1) Gender differences and investment efficiency of executives are not significant related. (2) The higher the average age of the senior management team, the lower the level of non-efficiency investment. (3) The higher the level of education of the senior management team, the lower the level of non-efficiency investment.

5.2. Research Enlightenment

From a theoretical perspective, the conclusions of this paper provide an explanation for the “non-efficiency investment” of enterprises from the management background, thus enriching the relevant research literature. From a practical perspective, the findings of this paper mean that companies can curb inefficient investments by adjusting the composition of senior management teams. In terms of personnel selection, managers who are older, experienced, senior, and highly educated are more likely to think more thoughtfully when making investment decisions, and this is based on the stable development of the company in the future. It is conducive to improving the efficiency of the company's investment and avoiding the problem of over-investment or under-investment.

6. References

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