

Can Managing Overseas Experience Improve Investment Efficiency

Yuchao Zhou*, Caixia Zhou

School of Economics and Management, Nanjing University of Science and Technology, Nanjing, China

*Corresponding author: 295776661@qq.com

Abstract. The efficient investment of enterprises is inseparable from the professional ability of managers. It has been found that the overseas experience of corporate executives can improve the investment ability of managers. This paper takes Shanghai and Shenzhen A-share listed companies from 2004 to 2020 as the research object, and investigates whether managers' overseas experience can improve the investment efficiency of enterprises. The empirical analysis results show that enterprises with overseas managers can improve the phenomenon of over investment, but the impact on the underinvestment is not significant. Based on the empirical results, it is found that the characteristics of managerial returnees have different impacts on enterprises in different industries. Compared with export-oriented enterprises, the characteristics of managerial returnees have more significant impacts on export-oriented enterprises. The reason for these results may be that managers' overseas experience is more conducive to the development of non-export-oriented enterprises.

Keywords: Investment efficiency; Overseas experience; Richardson model; Industry category.

1. Introduction

Human capital is the core factor of production that determines the business performance of an enterprise. Overseas experience is a specific form of human capital and a sign of good educational background, professional knowledge and even market contacts. In recent years, China's stable social environment and rapid economic development have attracted more and more overseas talents who have studied or worked abroad to return to China. From 1978 to 2019, a total of 6,566,600 Chinese went abroad to study. The number of overseas students returning to China has continued to increase, with the number of overseas returnees growing from 130,000 in 2000 to 4,231,700 in 2019, an increase of more than 31 times. In recent years, "International Vision" has replaced "strong language communication ability" as the main advantage of returnees in their domestic development. According to the blue book "China Study Abroad Development Report (2020-2021)", COVID-19 has not significantly affected the actual demand for studying abroad, and the number of Chinese students studying abroad has maintained a positive growth. In response to employers' high requirements for human capital, employers are paying more attention to the quality of their own education. Research shows that managers' overseas experience has a positive impact on enterprise performance. From the perspective of talent itself, senior executives or directors can receive better education and training through overseas experience, which has a positive impact on the improvement of personal ability. At the same time, executives or directors with overseas experience have international vision and contacts, so they can better explore overseas development channels and help enterprises expand their business network. Luo Siping (2012) used the fixed model of Negative Binomial to study the photovoltaic industry, and the results showed that corporate executives with overseas education or work experience could improve the innovation behavior of enterprises and promote their technological progress. Dai and Liu (2009) based on the 2006 Zhongguancun Science Park Development (ZSP development report) the classification of 1003 state-owned enterprises (managers with overseas experience) and 1138 local enterprises as sample data for empirical analysis. The results show that compared with executives without overseas experience, executives with overseas characteristics manage better performance of enterprises, and this gap may be caused by the difference in professional knowledge and overseas entrepreneurial orientation of executives. At the same time, the enterprise performance

is not only related to its strategy, but also related to investment efficiency. Efficient investment can drive the development of enterprises, create better returns for enterprises, and improve the performance of enterprises. The found that inspired the study in this paper, this article wants to cut from the perspective of managers overseas experience, using the latest Shanghai and shenzhen a-share listed company data, analysis of whether the manager with overseas experience actually can significantly improve the investment efficiency of the enterprise, the degree of this influence whether industry differences, as well as the impact on the mechanism of action of what it is.

Investment efficiency refers to the effective results of enterprise investment that is, the ratio between investment activities income and consumption. Many domestic and foreign literature show that due to information asymmetry, financing constraints and other problems will affect the investment efficiency of enterprises, the investment in reality is often deviated from the enterprise's expectation, which is prone to overinvestment and underinvestment. Overinvestment refers to the fact that enterprises have a large amount of free cash flow, and investors are keen to invest in some projects with net present value less than 0. They invest in various investment projects with unsatisfactory benefits to expand the investment scale. The investment income of such enterprises is lower than the investment cost, resulting in the decline of investment efficiency of enterprises. Underinvestment refers to the financing constraints of enterprises, and investors give up some investment opportunities with net present value greater than 0. Similarly, such behaviors will also lead to the decline of investment efficiency of enterprises.

Richardson(2006) believes that excessive investment is concentrated in enterprises with too much free cash flow, mainly because too much free cash flow is easy to cause agency problems between managers and shareholders. Chen (2011) believes that for enterprises of different ownership, government intervention will affect the investment behavior of enterprises and thus damage the investment efficiency. At the same time, the degree of disclosure of corporate financial information will also affect the investment efficiency of enterprises.

A large number of literatures show that the personal characteristics of senior executives play a crucial role in the investment decisions and investment efficiency of companies. The research of Chen Yunsen, Xie Deren (2011), Luo Hongxia (2014), Mi Yi (2015) and others found that the network location characteristics of independent directors in listed companies, the age, tenure, gender, education major, and work experience of senior executives all had a significant impact on the investment efficiency or overinvestment of enterprises. Taking Chinese listed companies from 2004 to 2009 as samples, Li Yan (2011) empirically found that in state-owned enterprises, the age and tenure of managers were negatively correlated with the investment scale, and such investment behavior had a negative impact on the investment efficiency of enterprises. In non-state-owned enterprises, the age of managers is negatively correlated with investment scale, but has no significant impact on investment efficiency. The overseas study experience of corporate executives will affect the age and tenure of managers, which may also affect the investment efficiency of enterprises by influencing the investment scale. Different from the financial perspectives of cash holding, about 3 bundles of financing and financial development in previous literatures, the characteristics of overseas returnees refer to the overseas study or work experience of corporate executives or directors, among which corporate executives mainly include directors, chairmen of the board of directors and other executives and directors of management. This paper investigates investment efficiency from the perspective of human capital, hoping to clarify the impact of senior executives' overseas experience on investment efficiency and provide feasible path suggestions for enterprises to improve investment efficiency.

2. Hypothesis to be tested and variable definition

2.1 Proposed hypothesis to be tested

Giannetti(2015) based on the data analysis of overseas education and work information of executive directors and non-executive directors of non-financial companies in Mainland China listed

in a-share market from 1999 to 2009, proposed that directors with overseas experience can reduce earnings management behavior of enterprises. If the overseas experience is in countries with more perfect legal system, The improvement effect to governance level is more obvious. Based on the above series of literature, hypothesis 1:

H1: under the same other conditions, the characteristics of overseas managers can improve the investment efficiency of enterprises

In China, as enterprises are engaged in different industries and have different resources, the returned executives or directors may play different roles in different types of enterprises. Export-oriented enterprises have more overseas resources and overseas sales channels, so the demand for overseas returnees is relatively large, while non-export-oriented enterprises are mainly engaged in domestic production and operation, with less resources involved in overseas production and operation. As a result, non-export-oriented enterprises have less demand for returnees, and senior executives or directors with overseas experience have less domestic resources and contacts, thus their contribution to such enterprises is greatly reduced. On the other hand, the development of enterprises is also inseparable from resources. Export-oriented enterprises have better overseas resources and can give full play to the advantages of overseas resources of returnees. Compared with enterprises whose products are mainly produced and operated in China, the advantages of returnees will be weakened. Such as auto industry the main production and operation of domestic auto production and distribution, this kind of enterprises will weaken the overseas returnees the advantage of rich resources, so this article wants to explore overseas characteristics influence degree of different industry enterprises is better or weak, put forward the hypothesis 2:

H2: in the case of other conditions unchanged, administrator returnees characteristics more prominent influence on export-oriented enterprise investment efficiency

2.2 Variable Definition

2.2.1 Investment efficiency

It mainly refers to the research of Richardson (2006) and Chen et al. (2011), which is a widely accepted estimation model at home and abroad. The model takes absolute residual as a proxy variable of investment efficiency. The model is as follows:

$$Inv_{i,t} = b_0 + b_1 TQ_{i,t-1} + b_2 Lev_{i,t-1} + b_3 Cash_{i,t-1} + b_4 Age_{i,t-1} + b_5 Size_{i,t-1} + b_6 Ret_{i,t-1} + b_7 Inv_{i,t-1} + \sum YearDummy + \sum IndustryDummy + \varepsilon_{i,t} \quad (1)$$

Table 1 Definitions of Richardson model independent variables

Variable	Define	
Inv _{i,t}	(Cash expenditure on fixed, intangible and other long-term assets less cash proceeds from sale of assets)/Total assets in the current period	The amount of capital invested by Company i in t
TQ	(the sum of market value of tradable shares, book value of non-tradable shares and liabilities)/Total assets of the current period	Company growth opportunities
Lev	Corporate liabilities/assets	The company's asset-liability ratio
Cash	Year-end monetary capital/total assets	Company cash holdings
Age	Ln (Current year - the year the company went public)	Age of listing
Size	Ln (Total assets of the Company)	The company size
Ret	The company's annual rate of return on the stock market	Corporate profitability

Model (1) All explanatory variables lag by one period. At the same time, the year and industry dummy variables were introduced to control the time and industry effect, and the industry classification was obtained according to the industry classification standard of China Securities Regulatory Commission. To mitigate the effect of outliers on model estimates, Winsorize all variables on 1% and 99% quantiles. The residual value of model (1) was used as a proxy variable to measure investment efficiency (InvA1). The larger the InvA1 value is, the lower the investment efficiency is. Since the variables used in Richardson's model are relative to each year, the residual value obtained is based on current data changes, so as to judge whether the investment efficiency is effective in the current year. Richardson divided the company's total investment expenditure into two parts: maintenance investment and net new investment. The new investment was further subdivided into expected investment and unexpected investment. He established an investment model and quantified the company's investment efficiency with the residual term in the model. Expected investment is defined as the investment expenditure influenced by the company's size, growth, industry characteristics, financing situation and other external factors, which is the best investment of the company. It is defined as the investment expenditure with positive expected net present value. Non-expected investment is interpreted as investment expenditure with low investment efficiency, and is the difference between actual investment and expected investment, namely residual value. According to the original model definition, if the residual value is greater than 0, it indicates that the company has overinvested. If the residual value is less than 0, it indicates that the company has underinvested. In addition, this paper uses book ratio (BM) as a proxy variable of growth opportunity to obtain the second investment efficiency measure (InvA2).

2.2.2 Characteristics of Overseas Returnees

Table 2 Definition of characteristic variables of overseas returnees

Variable	Define
Oversea	If the number of senior executives or directors with overseas study or work experience is greater than or equal to 1, the value is 1; otherwise, the value is 0
Oversea Only Work	If the senior officer or director has only worked overseas, the value is 1, otherwise, the value is 0
Oversea Only Edu	If the senior officer or director has only studied abroad, the value is 1; otherwise, the value is 0
Oversea Work and Edu	If the senior officer or director has worked and studied abroad at the same time, the value is 1; otherwise, the value is 0
Oversea CEO	If the CEO or chairman has worked and studied abroad at the same time, the value is 1; otherwise, the value is 0
Oversea Other	If the senior management or director of other management with overseas study or work experience ≥ 1 , the value is 1; otherwise, the value is 0

For the characteristic variable of enterprise overseas returnees, this paper constructs the dummy variable Oversea, which is defined as 1 if the senior executives or directors of the enterprise with overseas study or work experience ≥ 1 , otherwise 0. In addition, in order to further analyze the characteristics of overseas returnees, this paper also constructs a dummy variable Oversea Only Work, which is 1 if the senior executives or directors only have overseas working experience, and 0 otherwise. The dummy variable Oversea Only Edu of overseas study experience is 1 if the senior executives or directors only have overseas study experience, otherwise 0; Overseas study and work experience dummy variable Oversea Work and Edu, if the senior executives or directors have overseas work and study experience at the same time, it is 1; otherwise, it is 0; The dummy variable Oversea CEO is whether the CEO or chairman of the board has overseas experience. If the CEO or chairman of the board has both overseas work experience and overseas study experience, it is 1; otherwise, it is 0. The dummy variable Oversea Other of other managementships (except CEO and

chairman) has overseas experience. If the senior executives or directors of other managements with overseas study or work experience ≥ 1 , the value is 1; otherwise, the value is 0.

2.2.3 Control variables

Table 3 Definition of control variables

Control variables	Define	
PPE	Fixed assets/total assets	Ratio of fixed assets of the company
CFO	Net cash flow from operating activities/Total assets	Net operating cash flow of the company
Ret	The company's annual rate of return on the stock market	Corporate profitability
MB	Book value/Total assets	Book-to-market ratio
ROA	Net profit/Total assets	Return on assets
Board	$\ln(1 + \text{Number of board members})$	Board size
Block	Equity concentration index /100	Shareholding ratio of the largest shareholder
Out	Number of independent directors/directors	Proportion of independent directors
Foreign Own	Number of shares initiated from abroad/share capital	Foreign ownership
Manage Own	Management shareholding/share capital	Management ownership
Manage Age	$\ln(1 + \text{Actual average age})$	Age of manager
Fe-male	$\ln(1 + \text{Number of female executives})$	Gender

PPE is defined as the proportion of fixed assets of the company. The CFO is the company's net operating cash flow (higher operating cash flow provides more resources for investment). Meanwhile, MB (book-to-market ratio), Ret (annual rate of return) and ROA (return on assets) are added as control variables in order to control the growth opportunities and profitability of the company. In terms of corporate governance, this paper controls Board (Board size), Block (shareholding ratio of the largest shareholder), Out (proportion of independent directors), Foreign Own (shareholding ratio of foreign shareholders) and Manage Own (shareholding ratio of management). In order to control the basic characteristics of senior executives and directors of listed companies, this paper introduces Manage Age (average age of all senior executives and directors of listed companies) and Female (proportion of Female senior executives and directors).

2.3 Descriptive Statistics

The measurement methods of investment efficiency mainly include Richardson model and Biddle model. In recent years, the Richardson model has been recognized by many scholars and is most widely used. Investment efficiency 1 is the investment efficiency measured by Richardson model regression. Investment efficiency refers to the book than 2 (BM) as proxy variable of growth opportunities, get the second measure of investment efficiency, because the company books than (BM) is also indicated that the company's growth opportunities, this paper selected two kinds of investment efficiency measure variables to compare the original model and the modified model income from the investment efficiency of the mean, standard deviation exists significant differences. The characteristics of overseas returnees refer to that senior executives or directors of enterprises have overseas study or work experience, among which senior executives mainly include directors, chairman of the board and other senior executives and directors of management. This article set when executives and directors have experienced overseas work experience or study abroad is greater than or equal to 1 are defined as the number of have characteristics of sea turtles, model is set to take 1, 0,

conversely, the subsequent empirical respectively research has the characteristics of sea turtles the CEO and other management (in addition to the CEO and chairman of the board of directors) significant difference of the impact of corporate investment efficiency. The research samples of this paper are mainly a-share listed companies in Shanghai and Shenzhen stock markets, and the sample period is from 2004 to 2020. The sample was selected from 2004, and the company manager information was disclosed from 2004. The listed companies in the financial industry were excluded, and the missing values were also excluded. The resume of senior executives and directors is extracted from CSMAR database, and the information about overseas work or study of relevant personnel is collected manually. The company's financial data, stock return data and industry breakdown are from the CCER database. At the same time, the missing data of corporate financial data and stock earnings data were excluded.

Table 4 Descriptive statistics

Variable	Count	Mean	Sd	Min	P50	Max
InvA1 _{t-1}	28754	0.328	0.403	0.000	0.210	4.858
InvA2 _{t-1}	28754	0.328	0.401	0.000	0.210	4.826
Oversea _{t-1}	28754	0.482	0.500	0.000	0.000	1.000
Size _{t-1}	28754	21.910	1.292	18.266	21.755	27.293
Lev _{t-1}	28754	0.466	0.242	0.027	0.461	3.678
Cash _{t-1}	28754	0.172	0.127	0.000	0.138	0.857
PPE _{t-1}	28754	0.244	0.176	0.001	0.209	0.806
CFO _{t-1}	28754	0.044	0.077	-0.289	0.043	0.387
Ret _{t-1}	28754	0.187	0.775	-0.842	-0.053	6.503
MB _{t-1}	28754	0.640	0.246	0.056	0.654	1.227
ROA _{t-1}	28754	0.032	0.073	-0.694	0.033	0.429
Board _{t-1}	28754	2.275	0.184	1.792	2.303	2.890
Block _{t-1}	28754	0.357	0.153	0.080	0.334	0.786
Foreign_Own _{t-1}	28754	0.008	0.046	0.000	0.000	0.481
Manage_Own _{t-1}	28754	0.093	0.177	0.000	0.000	0.749
Manage_Age _{t-1}	28754	3.907	0.067	3.678	3.910	4.069
Female _{t-1}	28754	0.138	0.104	0.000	0.125	0.500

This paper selects a-share listed companies in Shanghai and Shenzhen from 2004 to 2020, and obtains 28,754 samples after excluding financial enterprises. As of November 25, 2020, there were 1,844 listed companies in China's A-share market, and half of the executives or directors of the companies were overseas returnees, that is, they had overseas study experience or work experience. As can be seen from the data in Table 4, the proxy index of investment efficiency estimated by TQ variable model is very close to that estimated by BM variable model, and there is a slight difference in standard deviation. About 48.2% of the observed values of the variables of overseas returnees have the characteristics of overseas returnees, and the standard deviation of the characteristics of enterprises' overseas returnees is large, indicating that the characteristics of enterprises' overseas returnees vary greatly among the sample companies. The impact of the characteristics of enterprises' overseas returnees on the investment efficiency of enterprises will be studied by industry. Based on this situation, this paper will analyze whether the overseas characteristics of enterprises have a significant impact on the investment efficiency of enterprises. Further analysis was carried out according to different industries, which were mainly divided into export-oriented industries and non-export-oriented industries. Considering the data integrity and industry influence, textile and garment industry and household appliance industry were selected as representatives of export-oriented enterprises. The aviation industry and automobile industry as non-export - oriented industry representative.

Table 5 Descriptive analysis of export-oriented and non-export-oriented industries

	Export-oriented industries			Non-export-oriented industries		
	Count	Mean	Sd	Count	Mean	Sd
InvA1	12673	0.323	0.388	16081	0.332	0.413
InvA2	12673	0.323	0.385	16081	0.331	0.413
Oversea	12673	0.497	0.5	16081	0.471	0.499

Table 6 Descriptive analysis of industries

	Textile and apparel		Home appliance industry		The aviation industry		The car industry	
	mean	sd	mean	sd	mean	sd	mean	sd
InvA1	0.333	0.394	0.339	0.397	0.232	0.373	0.272	0.32
InvA2	0.334	0.391	0.338	0.393	0.233	0.373	0.272	0.317
Overseas	0.378	0.485	0.495	0.500	0.44	0.497	0.516	0.5

Compared with Table 4, in 28754 samples, it is obvious that the average investment efficiency of non-export-oriented industries is low ($0.332 > 0.328$). The average investment efficiency of export-oriented industries is higher than that of the market ($0.323 < 0.328$) (according to the model, the higher the investment efficiency value is, the lower the efficiency is). The data in Table 6 show that there are still large differences among industries. The investment efficiency of textile, clothing and home appliance industries is slightly lower than that of aviation industry and automobile industry, while the corresponding volatility of investment efficiency is slightly higher than that of the latter industry. However, the standard deviation of the characteristics of overseas returnees differs little among industries. This provides data support for subsequent research on investment efficiency in different industries.

3. Empirical research

3.1 Regression analysis

3.1.1 Grouping test

Table 7 Regression results of grouping test

	Overseas		No Overseas		correlation
InvA1	13869	0.303	14885	0.351	-0.048***
InvA2	13869	0.303	14885	0.350	-0.047***

The total samples were divided into the group with the characteristics of overseas returnees and the group without the characteristics of overseas returnees, and the investment efficiency of the two groups of samples was tested by T test. According to the test results, the investment efficiency of the sample enterprises with the characteristics of overseas returnees is lower and higher than that of the samples without the characteristics of overseas returnees. From the preliminary test, the characteristics of overseas returnees have a certain impact on the investment efficiency of enterprises.

Establish multiple regression model

Based on the above conclusions, model 2 is established:

$$InvA_{i,t} = \alpha + \beta_1 Overseas_{i,t} + \beta_n Controls_{i,t-1} + \sum Yeardummy + \sum Industrydummy + \varepsilon_{i,t} \quad (2)$$

In the model, InvA is investment efficiency, and the smaller the residual value is, the higher the investment efficiency is. Oversea is a dummy variable of 9 enterprises' overseas returnees. If at least one senior executive or director of the enterprise has overseas study or work experience in that year, the value is 1; otherwise, the value is 0. Controls are a series of control variables, and Year dummy and Industry dummy are annual and Industry dummy variables.

3.1.2 Regression results

In order to compare the differences between the two models, models (1), (3) and (5) were InvA1, and models (2), (4) and (6) were InvA2. According to model (1) and (2), when only the characteristic variables of overseas returnees are added, the coefficient of Oversea is significantly negative, indicating that enterprises with overseas returnees have higher investment efficiency, which proves hypothesis 1. Then the variable "Oversea" is split and the influence of overseas study experience and overseas work experience is considered. Oversea Only Work and Oversea Only Edu and Oversea Work and Edu were added into model (3) and (4) respectively. As can be seen from the regression results, both InvA1 and InvA2, the coefficient of overseas work experience is positive and has no significant influence on investment efficiency. It is preliminarily concluded that overseas work experience has little influence on investment efficiency. The variable coefficient of overseas study experience is negative and significant, which conforms to the hypothesis. Model regression results show that overseas study experience (Oversea Only Edu) has a significant impact on investment efficiency. The variables of overseas work experience and overseas study experience (Oversea Work and Edu) are positive and insignificant. Model (1), model (2), model (3) and model (4) show that among overseas characteristic variables, the improvement of investment efficiency mainly comes from overseas study experience. Since the CEO or chairman has a major say in corporate decisions, consider that the CEO has different influence than others. Model (5) (6) compares the influence of Oversea CEO and other executives or directors with overseas characteristics. Regression results show that CEOs with overseas characteristics have no significant impact on investment efficiency, but other executives have significant impact on investment efficiency.

Table 8 Split the results of characteristic regression of returnees

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	InvA1	InvA2	InvA1	InvA2	InvA1	InvA2
Oversea	-0.011**	-0.012***				
	(-2.409)	(-2.662)				
Oversea_Only_Work			0.006	0.005		
			(1.293)	(1.003)		
Oversea_Only_Edu			-0.011**	-0.011**		
			(-2.242)	(-2.383)		
Oversea_Work_and_Edu			0.005	0.005		
			(0.858)	(0.802)		
Oversea_CEO					0.009	0.008
					(1.246)	(1.160)
Oversea_Other					-0.009*	-0.010**
					(-1.886)	(-2.139)

In terms of control variables, company Size (Size) and asset-liability ratio (Lev) are significantly negatively correlated with enterprise investment efficiency, while net operating cash flow (CFO) and fixed asset ratio (PPE) are positively correlated with enterprise investment efficiency. In terms of corporate performance indicators, corporate performance is positively correlated with corporate investment efficiency.

Table 9 Regression results of control variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Size _{t-1}	-0.011*** (-3.946)	-0.005* (-1.684)	-0.012*** (-4.272)	-0.006** (-2.017)	-0.012*** (-4.082)	-0.005* (-1.816)
Lev _{t-1}	-0.023* (-1.806)	-0.031** (-2.471)	-0.022* (-1.728)	-0.030** (-2.393)	-0.022* (-1.758)	-0.031** (-2.423)
Cash _{t-1}	0.160*** (6.747)	0.156*** (6.588)	0.159*** (6.714)	0.156*** (6.557)	0.159*** (6.730)	0.156*** (6.572)
PPE _{t-1}	0.231*** (11.361)	0.225*** (11.085)	0.232*** (11.407)	0.226*** (11.132)	0.231*** (11.356)	0.225*** (11.080)
CFO _{t-1}	0.018 (0.508)	0.009 (0.263)	0.017 (0.492)	0.009 (0.248)	0.018 (0.510)	0.009 (0.265)
Ret _{t-1}	0.048*** (7.334)	0.045*** (6.955)	0.048*** (7.376)	0.046*** (6.996)	0.048*** (7.340)	0.045*** (6.961)
BM _{t-1}	-0.127*** (-7.838)	-0.174*** (-10.847)	-0.124*** (-7.638)	-0.171*** (-10.651)	-0.125*** (-7.733)	-0.173*** (-10.743)
ROA _{t-1}	0.226*** (6.304)	0.217*** (6.059)	0.227*** (6.337)	0.219*** (6.089)	0.227*** (6.333)	0.218*** (6.087)
Board _{t-1}	-0.001 (-0.061)	0.001 (0.071)	-0.002 (-0.137)	-0.000 (-0.001)	-0.001 (-0.061)	0.001 (0.069)
Block _{t-1}	0.040** (2.444)	0.043*** (2.650)	0.040** (2.440)	0.043*** (2.646)	0.040** (2.458)	0.043*** (2.663)
Foreign_Own _{t-1}	0.231*** (3.897)	0.231*** (3.882)	0.217*** (3.646)	0.217*** (3.640)	0.222*** (3.745)	0.223*** (3.733)
Manage_Own _{t-1}	0.076*** (5.174)	0.079*** (5.411)	0.073*** (5.021)	0.077*** (5.265)	0.074*** (5.068)	0.077*** (5.306)
Manage_Age _{t-1}	-0.173*** (-4.172)	-0.171*** (-4.123)	-0.173*** (-4.154)	-0.170*** (-4.103)	-0.173*** (-4.167)	-0.170*** (-4.116)
Female _{t-1}	0.065*** (2.809)	0.069*** (2.998)	0.066*** (2.854)	0.070*** (3.045)	0.065*** (2.808)	0.069*** (2.998)
Constant	1.324*** (8.341)	1.213*** (7.672)	1.343*** (8.447)	1.231*** (7.771)	1.330*** (8.377)	1.219*** (7.704)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Vintage effect	Yes	Yes	Yes	Yes	Yes	Yes
N	28754	28754	28754	28754	28754	28754
R ²	0.088	0.088	0.088	0.088	0.088	0.088

3.2 The impact of the characteristics of overseas returnees on underinvestment and overinvestment

The investment efficiency residuals predicted by Richardson's model are divided into underinvestment and overinvestment, so model (2) is estimated in groups. Table 10 reports the different results of underinvestment and overinvestment in the characteristics of enterprise returnees. Model (1) and (3) used InvA1 as the dependent variable, and model (2) and (4) used InvA2 as the dependent variable. In the overinvestment group, the Oversea variable is significantly negative but the coefficient is very small, indicating that the enterprises with the characteristics of overseas returnees can improve the overinvestment of enterprises to a small extent. In the underinvestment group, the coefficient of Oversea-oversea is not significant, indicating that the enterprises featured by overseas returnees cannot effectively improve the problem of underinvestment. Based on the above phenomenon, the following explanations are put forward: Executives and directors with overseas experience can reduce the current situation of overinvestment through professional knowledge and

rational investment. Meanwhile, they can investigate the situation of internal managers and alleviate the agency problem of managers and shareholders. However, the underinvestment enterprises, even if they have the senior executives and directors with overseas experience and have professional decision-making ability, lack of capital, it is difficult to improve the situation of underinvestment.

Table 10 Comparative regression results of overinvestment and underinvestment groups

Variable	Overinvestment		Underinvestment	
	(1)	(2)	(3)	(4)
Oversea	-0.003 ^{***}	-0.003 ^{***}	0.000	-0.000
	(-3.310)	(-3.267)	(0.001)	(-0.550)
Size _{t-1}	-0.002 ^{***}	-0.002 ^{**}	-0.001 ^{***}	0.001 ^{**}
	(-3.040)	(-2.501)	(-3.647)	(2.390)
Lev _{t-1}	-0.005 ^{**}	-0.006 ^{**}	-0.004 ^{***}	-0.005 ^{***}
	(-2.140)	(-2.299)	(-3.836)	(-4.918)
Cash _{t-1}	0.032 ^{***}	0.033 ^{***}	0.011 ^{***}	0.009 ^{***}
	(5.152)	(5.358)	(6.896)	(5.948)
PPE _{t-1}	0.029 ^{***}	0.028 ^{***}	0.011 ^{***}	0.010 ^{***}
	(6.088)	(5.997)	(6.808)	(6.291)
CFO _{t-1}	0.010	0.009	-0.014 ^{***}	-0.013 ^{***}
	(1.271)	(1.034)	(-5.027)	(-5.093)
Ret _{t-1}	0.007 ^{***}	0.007 ^{***}	0.003 ^{***}	0.002 ^{***}
	(4.909)	(4.721)	(5.556)	(4.625)
BM _{t-1}	-0.026 ^{***}	-0.029 ^{***}	-0.004 ^{***}	-0.015 ^{***}
	(-6.919)	(-7.760)	(-2.840)	(-11.095)
ROA _{t-1}	0.022 ^{**}	0.019 ^{**}	0.004	0.004
	(2.354)	(1.967)	(1.484)	(1.386)
Board _{t-1}	-0.001	0.000	-0.002	-0.002
	(-0.249)	(0.107)	(-1.533)	(-1.557)
Block _{t-1}	0.004	0.004	0.004 ^{**}	0.005 ^{***}
	(1.213)	(1.224)	(3.135)	(3.671)
Foreign_Own _{t-1}	0.025 ^{**}	0.029 ^{**}	0.017 ^{***}	0.016 ^{***}
	(2.093)	(2.427)	(3.496)	(3.232)
Manage_Own _{t-1}	0.004	0.003	0.008 ^{***}	0.009 ^{***}
	(1.332)	(1.054)	(6.393)	(7.843)
Manage_Age _{t-1}	-0.028 ^{***}	-0.028 ^{***}	-0.012 ^{***}	-0.012 ^{***}
	(-2.981)	(-3.084)	(-3.611)	(-3.655)
Female _{t-1}	0.009 [*]	0.009 [*]	0.006 ^{**}	0.007 ^{***}
	(1.837)	(1.817)	(3.355)	(3.578)
Constant	0.211 ^{***}	0.209 ^{***}	0.099 ^{***}	0.079 ^{***}
	(5.887)	(5.865)	(7.887)	(6.302)
Industry effect	Yes	Yes	Yes	Yes
Vintage effect	Yes	Yes	Yes	Yes
<i>N</i>	10808	10891	17946	17863
<i>R</i> ²	-0.039	-0.040	-0.025	-0.025

3.3 Comparative analysis of export-oriented and non-export-oriented industries

Table 11 Comparative analysis of export-oriented enterprises and non-export-oriented industries

	Export-oriented		Non-export oriented	
	InvA1	InvA2	InvA1	InvA2
Oversea	-0.005	-0.005	-0.015**	-0.017***
	(-0.791)	(-0.797)	(-2.408)	(-2.689)
Oversea_Only_Work	-0.017**	-0.017**	-0.004	-0.006
	(-2.398)	(-2.39)	(-0.530)	(-0.921)
Oversea_Only_Edu	-0.007	-0.006	-0.014**	-0.015**
	(-0.971)	(-0.902)	(-2.169)	(-2.359)
Oversea_Work_and_Edu	-0.008	-0.008	-0.003	-0.003
	(-0.926)	(-0.913)	(-0.35)	(-0.321)
Oversea_CEO	-0.012	-0.012	-0.003	-0.004
	(-1.265)	(-1.213)	(-0.36)	(-0.374)
Oversea_Other	-0.005	-0.005	-0.011*	-0.013**
	(-0.711)	(-0.719)	(-1.792)	(-2.097)

Conclusion Table 8 shows that the characteristics of overseas returnees have a significant impact on the investment efficiency of enterprises, but does not mention the degree of impact on different industries. Before the analysis of individual industries, the research samples are divided into export-oriented and non-export-oriented industries, and the significance of the impact of the characteristics of overseas returnees on the investment efficiency of these two industries is analyzed. According to the regression results in Table 11, Oversea Only Work has a significant impact on the investment efficiency of export-oriented enterprises, the regression coefficient is negative and significant, and the influence of other variables is weak. The characteristics of enterprise overseas returnees, Oversea Only Edu and Oversea Other have a significant impact on the investment efficiency of non-export-oriented enterprises.

The above regression results show that the overseas work experience of senior executives has a significant impact on export-oriented industries, mainly because most export-oriented industries are manufacturing industries, such as textile industry and home appliance industry, which have high requirements on overseas work experience. Instead of export-oriented industries are greatly influenced by characteristics of sea turtles and overseas experience, the main reason is export products for the domestic industry, demand for overseas resources and overseas marketing is small, compared to executives overseas work experience, pay more attention to the export-oriented industry executives abroad experience, thus formed the regression results.

Regression result shows that the enterprise characteristic of sea turtles on the export-oriented industry investment efficiency influence more prominent, this has to do with this hypothesis 2 (H2: in the case of other conditions unchanged, characteristics of sea turtles are more significant impact on export-oriented enterprise investment efficiency), but executives overseas work experience significant effects on the export-oriented industry investment efficiency, this is a special regression results in this paper.

3.4 Comparative analysis of the impact of the characteristics of overseas returnees on investment efficiency in different industries

Table 12 Regression results of individual industries

	Textile and apparel		Home appliance industry		The aviation industry		The car industry	
	InvA1	InvA2	InvA1	InvA2	InvA1	InvA2	InvA1	InvA2
Main Oversea	-0.042	-0.038	0.028*	0.026*	0.136	0.148	-0.011	-0.006
	(-1.584)	(-1.449)	(-1.866)	(-1.735)	(0.888)	(0.963)	(-0.437)	(-0.256)
Oversea_Only_Work	-0.054*	-0.050*	0.022	0.019	0.008	0.029	0.021	0.019
	(-1.899)	(-1.792)	(-1.533)	(-1.363)	(0.08)	(0.308)	(-0.98)	(-0.886)
Oversea_Only_Edu	0.003	0.01	0.021	0.017	0.121	0.125	-0.014	0.007
	(-0.094)	(-0.329)	(-1.415)	(-1.216)	(-0.853)	(-0.868)	(-0.592)	(-0.296)
Oversea_Work_and_Edu	-0.028	-0.032	0.006	-0.01	-0.026	-0.027	0.003	0.001
	(-0.814)	(-0.910)	(-0.347)	(-0.545)	(-0.226)	(-0.235)	-0.13	-0.05
Oversea_CEO	0.086**	0.082**	-0.01	0.008	0.312***	0.326***	-0.01	0.005
	-2.3	-2.175	(-0.508)	(-0.415)	(-2.666)	(-2.836)	(-0.399)	(-0.187)
Oversea_Other	0.061**	0.056**	0.023	0.021	0.117	0.125	-0.002	0.001
	(-2.279)	(-2.111)	(-1.575)	(-1.461)	-0.85	-0.909	(-0.101)	(-0.041)

Based on the regression results in Table 12, two industries with the most comprehensive data and the most significant influence are selected from export-oriented enterprises and non-export-oriented enterprises respectively.

The above empirical results show that Oversea has a certain impact on the investment efficiency of enterprises. However, considering the different business categories involved in various industries, it remains to be studied whether Oversea has a significant impact on the investment efficiency of different industries. Based on this series of speculations, this paper mainly selects textile and clothing industry, home appliance industry, aviation industry and automobile industry, among which textile and clothing industry and home appliance industry are export-oriented industry representatives, while

aviation industry and automobile industry are non-export-oriented industry representatives. The regression of the four industries is obtained in the table above.

According to the regression results in Table 8, the characteristics of overseas returnees and Oversea onlywork have a significant impact on the investment efficiency of enterprises. On the basis of industry classification, the results show that the regression coefficients of OverseaOnlyWork and OverseaOther are negative and significant. The OverseaCEO of CEO is significant but the regression coefficient is positive, that is, the overseas working experience in textile industry and other overseas characteristics of senior executives have a significant impact on the investment efficiency of enterprises. The regression results show that the characteristics of overseas managers in the household appliance industry have a significant impact on the investment efficiency of enterprises. The characteristics of returnees of aviation industry managers are positive, while the other variables are negative but not significant. All variables in automobile industry are not significant. According to the above regression results, export-oriented enterprises (textile and clothing, home appliance industry) are not affected by Oversea Only Work. Oversea Only Work has a great impact on the investment efficiency of textile and garment industry, the characteristics of senior executives returning from overseas have a great impact on the investment efficiency of home appliance industry, non-export-oriented enterprises (aviation industry and automobile industry), and Oversea CEO has a significant impact on the investment efficiency of aviation industry. CEO decisions have a big impact on the airline industry, which has a high demand for high-quality talent. However, compared with the automobile industry, neither the characteristics of managers returning from overseas nor the working experience abroad has significant impact on the investment efficiency of the automobile industry.

Therefore, it is concluded that the overseas working experience of senior executives has a significant impact on the investment efficiency of export-oriented enterprises, and the characteristics of overseas managers have a significant impact on non-export-oriented enterprises. From micro to different industries, overseas working experience and overseas study experience of managers have different impacts on different industries. Even for the same export type enterprises, the characteristics of senior executives returning from overseas have different significant impacts on different industries.

4. Robustness test

Table 13 Robustness test

	(1)	(2)	(3)	(4)
	InvA1	InvA2	InvA1	InvA2
Oversea	-0.010**	-0.011**		
	(-2.101)	(-2.352)		
Oversea _{t-1}			-0.015***	-0.016***
			(-3.162)	(-3.257)
Control variables	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes
Vintage effect	Yes	Yes	Yes	Yes
<i>N</i>	28717	28717	28717	28717
<i>R</i> ²	0.088	0.089	0.088	0.088

Based on the marketization process index of Fan Gang (2011), this paper constructs a measure to measure the characteristics of regional institutions, and uses this index to control the influence of regional institutional factors on enterprise investment efficiency. The average value of the standardized competition in the Financial industry and the marketization index of credit capital distribution is used as the Financial system occurrence index of the region in that year. In model (1) and (2), Financial is taken as a control variable to re-test hypothesis 1, and the results are still significant.

Model (3) and model (4) are regression of the characteristics of overseas returnees in order to reduce the impact of endogenous problems and alleviate the problem that enterprises attract overseas talents due to high investment efficiency. The results showed that the regression results were still significant and consistent with the hypothesis.

5. Conclusion

Based on the research results of this paper, it can be seen that corporate managers with the characteristics of overseas returnees can improve the investment efficiency of enterprises, and have a more significant impact on over-investment. Compared with non-export-oriented industries, the characteristics of overseas returnees have a more significant impact on the investment efficiency of non-export-oriented industries, while the overseas working experience of managers has a more significant impact on the investment efficiency of export-oriented industries.

This paper finds that returnees can play a positive role in enterprises, but it also requires enterprises to provide appropriate resources and platforms, improve the institutional environment of enterprises, and carry out systematic management. In recent years, the implementation of talent introduction policy makes us pay more attention to the importance of innovative talents. This paper also provides a theoretical basis for the implementation of this policy. Talents are the inexhaustible driving force for the development and growth of enterprises today. This study shows that returnees have a significant impact on the investment efficiency of enterprises, especially for over-investment enterprises.

All industries should attach importance to the introduction of returnees, improve the investment efficiency of enterprises, and promote the development of all industries. For export-oriented enterprises, returnee talents are particularly important. Returnee executives have perfect knowledge structure and strong management ability. Rational use of high-quality overseas education can help executives deepen their understanding of capital market rules and improve enterprise operation level. Returnees have a more professional and detailed way to deal with problems. They can fully integrate the information they have obtained into their judgment, thus improving the accuracy of project estimation, thus helping enterprises to make more accurate and faster assessment of investment risks and improving their ability to make investment decisions. Executives with overseas experience can help companies establish and improve modern management systems, strictly enforce corporate governance guidelines, reduce earnings management practices and improve financial information transparency. Reasonable arrangement of executives with overseas experience can further improve the investment efficiency and promote the rapid development of enterprises.

References

- [1] MARIASSUNTA GIANNETTI, GUANMIN LIAO, XIAOYUN YU. The Brain Gain of Corporate Boards: Evidence from China[J]. *The Journal of Finance*, 2015, 70(4):
- [2] Ou Dai, Xiaohui Liu. Returnee entrepreneurs and firm performance in Chinese high-technology industries[J]. *International Business Review*, 2009, 18(4):
- [3] Zhang Xuan, Li Zijian, Li Chuntao. Competition, financing constraints and firm innovation: Evidence from China's industrial firms [J]. *Financial Research*, 2019(10):98-116.]
- [4] Dai Yunhao, KONG Dongmin. *International business review*, 2017, 40(01):168-192.
- [5] Fan Tianyi. Research on the impact of CFO change on investment efficiency [D]. Dongbei University of Finance and Economics, 2015.
- [6] Chen Yunsen, Xie Deren. Network location, independent director governance and investment efficiency [J]. *Management World*, 2011(07): 113-127.]
- [7] Li P, Xu J Y. Human capital, foreign direct investment and technology spillover of returnees [J]. *Science and technology & economy*, 2011, 24(02):95-99.
- [8] Li Yan, Qin Yihu, ZHANG Xiaofei. *Management World*, 2011(01): 135-144.

- [9] Fan Gang, Wang Xiaolu, Zhang Liwen. *Journal of The National School of Governance*, 2001(03):17-27.
- [10] Yan Qianqian. *Characteristics of senior management team and overinvestment* [D]. Shanxi University of Finance and Economics, 2020.
- [11] Mi Yi. *Personal Characteristics, Corporate Governance and overinvestment of Senior executives of State-owned listed Companies* [D]. Beijing Institute of Technology, 2015.
- [12] Luo Hong-xia, LI Hong-xia, LIU Lu. *The impact of corporate executives' personal characteristics on corporate performance: The introduction of a mediating variable: investment efficiency* [J]. *Economic Problems*, 2014(01): 110-114.]
- [13] Wu Ruxin. *Research on the Impact of Executive Overconfidence on Enterprise Investment Decision* [D]. Central South University, 2011.