WEP Warwick Evans Publishing

Transactions on Economics, Business and Management Research
ISSN: 2960-1789, eISSN: 2960-2254 | Volume 10
MEEA 2024

Overseas Returnee Executives and Digital Transformation of Enterprises: From the Perspective of Executive Compensation Gap and Executive Overconfidence

Qi Huang[a], Yuhang Xu[b] and Shiming Tu[c]

School of Sunwah International Business, Liaoning University, Shenyang 110136, China

[a]hq2472260342@163.com, [b]neil98984264@163.com, [c]tushiming_0301@163.com

Abstract. This article selects panel data of A-share listed companies in Shanghai and Shenzhen from 2013 to 2022, uses a fixed effects model to study the relationship between overseas returnee executives and digital transformation of enterprises, and analyzes the moderating effects of executive compensation gap and executive overconfidence. The research results indicate that overseas returnee executives can significantly promote the digital transformation of enterprises; The salary gap and overconfidence of executives play a negative moderating role in the positive relationship between overseas returnees executives and digital transformation of enterprises; Heterogeneity analysis shows that overseas returnee executives have a greater impact on high-tech enterprises, low marketization areas, and enterprises in the eastern region than on non-high-tech enterprises, high marketization areas, and enterprises in the central and western regions. To better solve the problems of "not being able to transform", "unwilling to do", and "afraid to transform" in the process of enterprise digital transformation, firstly, it is necessary to effectively utilize the high-quality human resources of overseas returnee executives and provide them with reasonable care and support to better play their role; The second is to optimize the executive compensation structure and strengthen the correlation between compensation and performance; The third is to pay attention to leadership training and psychological counseling for executives, and ensure objective analysis and sufficient discussion in the decision-making process of digital transformation.

Keywords: Overseas returnee executives, digital transformation, executive compensation gap, executive overconfidence.

1. Introduction

In today's world, innovation in information technology is advancing at an unprecedented speed, and the trends of digitization, networking, and intelligence are constantly deepening. On February 27, 2023, the State Council issued the "Overall Layout Plan for the Construction of Digital China", which clarified the goals and guarantee measures for the construction of Digital China. By 2025, significant progress will be made in the construction of Digital China, forming an integrated promotion pattern; By 2035, the level of digital development will enter the forefront of the world, and significant achievements will be made in the construction of Digital China. This includes developing emerging industries such as artificial intelligence, the Internet of Things, cloud computing, big data, and blockchain, optimizing the digital transformation of traditional industries, and promoting the development of the digital economy. As an important micro carrier in the digital age, the progress of enterprise digital transformation is directly related to the overall progress of digital China construction. As enterprises increasingly adopt a digital first approach in all aspects of their business, from business models, customer experience to processes and operations, digital technology has become increasingly important. Overall, digital transformation is a strategic initiative that integrates digital technology into various areas of the organization. Digital transformation evaluates a company's processes, products, operations, and technology stack to determine methods to improve operational efficiency and bring products to market faster. However, some enterprises have encountered many obstacles on the path of digital transformation: some are "unable to transform" due to limited transformation capabilities, some are "unwilling to transform" due to high transformation costs, and some are "afraid to transform" due to the long and challenging transformation process (Tao Zhang, 2023). Therefore,

in-depth exploration of which factors can promote digital transformation of enterprises has extremely important theoretical and practical guidance significance. The fact has proven that digital transformation is fraught with difficulties, and many enterprises have relatively little understanding of this. Therefore, how to promote the smooth construction of enterprise digital transformation is one of the challenges currently faced by enterprises.

As strategic decision-makers of a company, executives need to conduct in-depth analysis of the market and industry, understand the competitive environment and trends, and formulate development strategic plans to ensure that the company can maintain a competitive advantage in the future. In digital transformation, executives need to guide companies to clarify the goals and directions of digital transformation, ensuring that the transformation strategy aligns with the overall strategy of the enterprise; Need to coordinate various resources to provide necessary support and guarantees for digital transformation; It is also necessary to establish a good corporate culture and values in the enterprise, improve the sense of belonging and loyalty of employees, and promote the development and growth of the enterprise. Therefore, we pay special attention to the role of executives in the digital transformation of enterprises. According to the theory of upper echelons theory, the past experiences and personal characteristics of executives can have a significant impact on corporate strategic decision-making and business management. This theory focuses on observable management characteristics, such as age, organizational tenure, functional background, educational level, socio-economic background, and financial status (Hambrick and Mason, 1984). Executives with overseas experience usually have an international perspective and rich cross-cultural experience. During their study or work abroad, they not only gained a deep understanding of the operating rules and best practices of the international market, but also accumulated experience in collaborating with teams and individuals from different cultural backgrounds. Secondly, they receive advanced education and training overseas, mastering the latest knowledge and skills. Meanwhile, these executives often possess strong innovative thinking and problem-solving abilities, which can bring new development ideas and opportunities to the enterprise. From this, it can be seen that the overseas background of the executive team does have a significant impact on the digital transformation of enterprises, and existing literature has paid insufficient attention to this. At the same time, literature on the relationship between overseas returnee executives and digital transformation of enterprises focuses more on the connection between the enterprise and the outside when exploring the moderating effect, and pays less attention to the internal factors of the enterprise. The executive compensation gap is an important issue in modern enterprise management, divided into internal compensation gap and external compensation gap. It not only relates to the internal incentive mechanism and employee satisfaction of the company, but also affects the external image and competitiveness of the company; From the perspective of executive psychology, overconfidence leads to decision-making biases in investment, financing, mergers and acquisitions, which also have a complex impact on the operation and development of enterprises. It is worth exploring how the salary gap and overconfidence can play a moderating role in the digital transformation of overseas returnee executives and enterprises.

Therefore, this article takes A-share listed companies in Shanghai and Shenzhen from 2013 to 2022 as samples to explore the impact of overseas returnee executives on corporate digital transformation, and further examines the moderating effect of executive compensation gap and executive overconfidence in it. This provides a theoretical framework for analyzing digital transformation decisions driven by executive background, and also provides reference for the internal governance effectiveness of corporate digital transformation. Based on this, the possible contributions of this article are mainly reflected in the following three aspects: at the theoretical level, firstly, exploring the driving logic of enterprise digital transformation from the perspective of internal executive teams, providing a new theoretical basis for enterprise digital transformation strategies; Secondly, incorporating the compensation gap and overconfidence among overseas returnee executives, executives, and digital transformation of enterprises into the same analytical framework, analyzing the moderating effect of executive compensation gap and overconfidence on the relationship between overseas returnee executives and digital transformation of enterprises, and strengthening the internal

compensation mechanism and logical deduction in the context of psychological bias. At the practical level, when enterprises face bottlenecks or difficulties in digital transformation, this study provides new ideas and references for enterprises from the perspective of human resources, better leveraging the important role of talent in digital transformation.

2. Literature Review

In the context of increasing globalization, the characteristics and composition of corporate executive teams have become important factors affecting corporate decision-making and strategic implementation. The Upper Echelons Theory suggests that the traits, experiences, and values of the executive team directly influence a company's strategic choices and decision-making processes. Existing literature has conducted in-depth research on the relationship between factors such as gender structure, professional background, and salary differences of executive teams and digital transformation of enterprises. For example, Tao Wang et al. (2024) found that the participation of female executives in teams has a significant impact on the digital transformation of enterprises and is one of the important driving factors for digital transformation; Yuhui Wu (2022) and others found that the information technology background of executives is conducive to promoting the digital transformation of enterprises; Dan Li et al. (2023) pointed out that when executive compensation is lower than the industry average, the external compensation gap of executives can effectively promote the digital transformation of enterprises. In addition, the heterogeneity of the executive team is also an important factor affecting the digital transformation of enterprises (Fangcheng Sun et al., 2023). Tang Xuan et al. (2022) found that the heterogeneity of executive teams mainly affects the digital transformation of enterprises through aspects such as information disclosure quality, financial debt leverage, innovation willingness, and innovation capability. Among them, the study by Yu Li and Tingting Wang (2024) further points out that under the same group effect, the heterogeneity of corporate executive teams has a promoting effect on the digital capabilities of enterprises. The study by Yuting Wei and Minghai Yang (2024) suggests that sharing experiences among executive teams can also affect the level of digital transformation. In addition, Chengcheng Wu and Xuan Li's (2024) study also combined financial abundance factors to explore the impact of executive team factors on digital transformation of enterprises. Starting from the academic background of executives, although their impact on corporate strategy and decision-making has been theoretically recognized, there is still a lack of relevant research specifically in the context of digital transformation.

In the study on the relationship between returnee executives and digital transformation of enterprises, Tao Zhang and Huimin Han (2023) found that executives with overseas experience are more inclined to adopt innovative management methods and technologies to promote digital transformation of enterprises; Hui Zhang and Qunhui Huang (2024) pointed out that returnee executives mainly promote digital transformation of enterprises through three mechanisms: improving the level of human capital, learning and absorption ability, and fulfilling ESG responsibilities; Yuanhai Bai (2023) found that Chinese analysts' attention has a positive moderating effect on executives' overseas experiences and digital transformation; Jian Xiao's (2022) study explored the moderating properties of financing constraints; Zhen Yang (2022) mainly examined the moderating effect of executive incentives on the academic experience of executives and the digital transformation of enterprises.

In summary, although existing literature has explored the relationship between executive team traits and corporate digital transformation, research on the factor of executive overseas experience is still relatively scarce, and research on moderating variables lacks an internal perspective of the enterprise. Future research can further explore the impact mechanism of executives' overseas experiences on digital transformation of enterprises, as well as the differences in impact under different conditions.

3. Theoretical analysis and research hypotheses

3.1. Overseas returnee executives and digital transformation of enterprises

Enterprise digital transformation refers to the comprehensive transformation and upgrading of enterprises using digital technology and support capabilities to meet the development needs of the digital economy era. This process not only needs to be driven by innovation, but also a fundamental change in business models, management models, and organizational structures (Jinghua Xiao, 2020). Therefore, digital transformation cannot be achieved overnight, but is a continuous process that not only requires enterprises to invest a large amount of financial, material, and human resources, but also has a relatively long return period.

Overseas returnee executives, as important human resources, can promote digital transformation of enterprises through strategic choices, innovation, and risk-taking. The imprinting theory suggests that early experiences, education, professional background, and other factors can have a profound impact on an individual's behavior, decision-making, and thinking patterns, which may persist over time and influence future behavior and decision-making. Firstly, overseas experience changes the values and cognitive level of executives. They have a broad international perspective, can look to the future, keenly perceive technological changes in the environment in which the enterprise operates, and realize the importance of digital transformation. Therefore, they have the motivation to drive the enterprise towards digitalization and formulate corresponding digital transformation strategies. Secondly, in the process of studying and working overseas, executives have accumulated rich theoretical knowledge and management experience, and consciously applied them to the company's management process, providing strong support for the technological application and innovative development of the enterprise; In addition, executives exhibit a confident state due to their knowledge and theories, and their acceptance of risks in the process of digital transformation is higher, thus increasing the level of enterprise risk-taking (Jianbo Song, 2017).

Overseas returnee executives will also benefit companies in obtaining more resources and optimizing resource allocation, providing resource guarantees for digital transformation. Having a developed social network is one of the important characteristics of overseas returnee executives (Hui Zhang, 2024), which makes it easier for companies to obtain external resources during the process of digital transformation, such as helping companies better gain the trust of investors such as credit institutions, improving corporate financing capabilities (Ran Yuan, 2022), and breaking through resource shortages. The professional knowledge and skills acquired by overseas returnee executives can also help them efficiently utilize internal and external resources, optimize resource allocation. For example, Yunhao Dai et al. (2017) proposed that overseas returnee executives can improve the investment efficiency of enterprises, thereby enabling funds to be used practically in the process of digital transformation and maximizing their effectiveness. Based on this, this article proposes hypothesis 1:

H1: Overseas returnee executives promote digital transformation of enterprises.

3.2. The moderating effect of executive compensation gap

The executive compensation gap is divided into internal executive compensation gap and external executive compensation gap. The internal compensation gap among executives refers to the difference in compensation between executives at different levels or departments within the same enterprise. This gap mainly reflects the degree of recognition of executives' contributions within the company, as well as how the company incentivizes executives' work enthusiasm through salary differences. The external salary gap of executives refers to the salary difference between executives in the same company and executives in other companies in the same industry. This gap reflects the market's recognition of executives' abilities and whether the compensation paid by companies to executives meets market standards.

Regarding the internal salary gap among executives, from the perspective of high paying executives, according to prospect theory, when making decisions, executives who gain profits will avoid risks, while those who gain losses will prefer risks. Combining the theory of deterministic effects, which suggests that people tend to prefer options that can reduce uncertainty, executives often try to avoid risks as much as possible in order to control the deterministic returns in their hands (Sitong Liu, 2018), which is not conducive to the implementation of digital transformation strategies. From the perspective of low paid executives, they are also prone to feelings of dissatisfaction and unfairness. This not only leads to a decrease in their willingness to cooperate, which in turn affects team work efficiency (Hellmann T, 2011), reducing innovation input level, innovation output, and innovation efficiency (Xiaoyan Wang, 2020), but also makes them unwilling to take any risks for the company (Ran Wang, 2022). Therefore, the widening gap in internal executive compensation will hinder returnee executives from breaking the digital divide of the company.

For the external compensation gap of executives, when their compensation is higher than the industry average, their sense of satisfaction makes them lack motivation and pressure to change their own compensation level. At the same time, combined with the certainty effect theory mentioned earlier, in order to maintain the existing compensation level and company status, executives often reduce their risk-taking level and are more cautious and risk averse when investing in projects, tending to adopt conservative investment strategies (Dan Li, 2023). Digital transformation is a comprehensive change with high investment and risk. Therefore, executives who receive high compensation levels are unwilling to bear the costs and risks of digital transformation and choose low-risk investment projects. When executive compensation is lower than the industry average, executives may perceive their value as diminished, leading to an increase in the voluntary turnover rate of executives within the company (Huiguo Lang, 2023) and a decrease in the stability of the executive team. However, research has shown that a stable team can accelerate the process of digital transformation by promoting efficient collaboration within the organization, assisting executives in value judgment, and enhancing the adaptability of the enterprise (Haojun Wang, 2023). Therefore, the external widening gap in executive compensation will hinder returnee executives from embracing digital transformation. Based on this, this article proposes hypothesis 2:

H2a: The negative adjustment of internal compensation gap among executives is positively correlated with the relationship between returnee executives and digital transformation of enterprises.

H2b: The negative adjustment of external compensation gap among executives positively moderates the relationship between returnee executives and digital transformation of enterprises.

3.3. Moderation effect of executive overconfidence

Executive overconfidence refers to the overly optimistic belief held by senior management in their own or their decision-making abilities and outcomes. This psychological state may lead them to overestimate the likelihood of success when faced with investment, innovation, and other decisions, resulting in choices that do not align with rational expectations. Firstly, overestimating project returns and underestimating project risks are important manifestations of managers' overconfidence (Li Dong, 2021). This characteristic can lead to low investment efficiency caused by excessive investment in enterprises, thereby increasing the pressure on cash flow and the risk of debt default (Haobin Yu, 2023). This increases the difficulty of financing for enterprises and reduces the resources that can be invested in their digital transformation; At the same time, overconfident executives are increasingly investing the resources owned by the company in the financial sector, seriously squeezing out the company's innovation investment (Jing Hao, 2023) and making it even more unable to meet the resource investment for digital transformation. Secondly, overconfident executives become complacent about their knowledge and experience, often attributing success to themselves and failure to other factors (Malmendier et al., 2008). As a result, they tend to be more casual and lax in their approach to corporate decision-making, easily overlooking negative information, leading to inaccurate judgments about the environment, timing, and risks in the process of digital transformation, which affects the quality of corporate decision-making. In summary, overconfidence among

executives will suppress the promoting effect of returnee executives on the digital transformation of enterprises by affecting resource investment and decision quality. Based on this, this article proposes hypothesis 3:

H3: Overconfidence of executives negatively moderates the positive correlation between returnee executives and digital transformation of enterprises.

4. Research Design

4.1. Sample selection and data sources

Select A-share listed companies in China's Shanghai and Shenzhen stock markets from 2013 to 2022 as the research sample, and conduct the following screening: ① Exclude data from financial and real estate industry companies; ② Exclude data from companies marked as ST or *ST; ③ After excluding company data with abnormal or missing financial data, a total of 26457 sample observations were obtained. The above research data mainly comes from the Guotai An CSMAR database and Wind database. At the same time, all continuous variables are Winsorized at the 1% and 99% levels to eliminate the influence of extreme values on regression analysis, and Stata18.0 was used for data processing and quantitative analysis.

4.2. Variable Definition

(1) Enterprise digital transformation

Referring to the research of Fei Wu et al. (2021), the annual reports of A-share listed companies in Shanghai and Shenzhen from 2013 to 2022 were collected and organized through Python crawler function, and searched and statistically analyzed using enterprise digital transformation feature words. Specifically, based on artificial intelligence technology, big data technology, cloud computing technology, blockchain technology, and digital technology, five feature word modules are used for search, matching, and word frequency counting, thereby adding up word frequencies. Due to the "right bias" characteristic of this type of data, this article will perform logarithmic processing on it to obtain the enterprise digital transformation index, which will be recorded as DCG. The larger the value, the higher the degree of digital transformation of the enterprise.

(2) Overseas returnee executives

This article refers to Hofstedeg's (2003) research and measures the proportion of directors with overseas experience in listed companies from 2013 to 2022 to the total number of directors on the board, denoted as Oversea.

(3) Executive pay gap

Firstly, based on the research of Jianbo Niu (2019), this article adjusts the unit of executive compensation to balance the coefficients of various indicators. Secondly, the top three executives in terms of salary will be classified as core executives, while the remaining executives will be classified as non-core executives. Finally, following the approach of Haifeng Gu (2021), the internal executive compensation gap (Gap1) is measured by the absolute difference between the average compensation of core executives and non-core executives, and the external executive compensation gap (Gap2) is measured by the absolute difference between the average compensation of core executives and industry executives.

(4) Executive overconfidence

Referring to the study by Baoxue Fan et al. (2022), the confidence level of executives is measured by the ratio of the total compensation of the top three executives to the total compensation of all executives. The higher the ratio, the more confident the executives are. If the value is greater than the sample mean, it is defined as overconfidence (OC), otherwise it is not overconfidence.

(5) Control variables

This article draws on the research designs of Tao Zhang and Huimin Han (2023), Xiaoshu Jin (2024), Hui Zhang and Huiqun Huang (2024), and sets the following control variables: REC (accounts receivable ratio), Growth (growth ability), Invest (investment level), Board (board size), Top 10 (shareholding ratio of the top ten shareholders), TobinQ (Tobin Q value). The specific variable names and definitions are shown in Table 1:

Table 1 Variable Definition

Variable	Definition	Computing method
DCG	Enterprise digital transformation	Take the natural logarithm of the total frequency of enterprise digital transformation characteristic words in the annual report of the company
Oversea	Overseas executives	Number of directors with overseas experience/total number of directors on the board
Gap1	Internal salary gap among executives	Abs (Average core executive compensation - Average non-core executive compensation)
Gap2	External executive compensation gap	Abs (Average core executive compensation - Average industry executive compensation)
OC	Executive overconfidence	The ratio of the total compensation of the top three executives to the total compensation of all executives, which is greater than the sample mean and takes a value of 1, otherwise it is 0
REC	Proportion of accounts receivable	Net accounts receivable/total assets
Growth	Revenue growth rate	Current year's operating income/previous year's operating income -1
Invest	Investment level	The ratio of cash paid for the construction of fixed assets, intangible assets, and other long-term assets to the total assets at the beginning of the period
Board	board size	Take the natural logarithm of the number of board members
Top10	Shareholding ratio of the top ten shareholders	Number of shares held by the top ten shareholders/total number of shares
TobinQ	Tobin Q value	(circulating stock market value+number of non circulating shares x net assets per share+book value of liabilities)/total assets

4.3. Model Construction

Considering that this article is based on panel data analysis and research, and to alleviate potential issues such as omitted variables in model design, a fixed effects model is used for empirical analysis, and the following model is constructed to explore the aforementioned research hypotheses:

To explore hypothesis H1, construct model (1):

$$DCG_{i,t} = \beta_0 + \beta_1 Oversea + \beta_2 REC + \beta_3 Growth + \beta_4 Invest + \beta_5 Board + \beta_6 Top10 + \beta_7 TobinQ + \mu_{i1} + \varepsilon_{it} \quad (1)$$

In order to explore H2 and H3, model (2), model (3) and model (4) are constructed respectively:

$$DCG_{i,t} = \alpha_0 + \alpha_1 Oversea + \alpha_2 Gap1 + \alpha_3 Oversea \times Gap1 + \alpha_4 REC + \alpha_5 Growth + \alpha_6 Invest + \alpha_7 Board + \alpha_8 Top10 + \alpha_9 TobinQ + \mu_{i2} + \sigma_{it} \quad (2)$$

$$DCG_{i,t} = \gamma_0 + \gamma_1 Oversea + \gamma_2 Gap2 + \gamma_3 Oversea \times Gap2 + \gamma_4 REC + \gamma_5 Growth + \gamma_6 Invest + \gamma_7 Board + \gamma_8 Top10 + \gamma_9 TobinQ + \mu_{i3} + \varphi_{it} \quad (3)$$

$$DCG_{i,t} = \delta_0 + \delta_1 Oversea + \delta_2 OC + \delta_3 Oversea \times OC + \delta_4 REC + \delta_5 Growth + \delta_6 Invest + \delta_7 Board + \delta_8 Top10 + \delta_9 TobinQ + \mu_{i4} + \omega_{it} \quad (4)$$

Among them, i represents the enterprise, t represents the year, μ_i represents the individual effect of the enterprise, and $\varepsilon_{it}, \sigma_{it}, \varphi_{it}$, ω_{it} represent the random disturbance terms of each model. β_1 is a key parameter for exploring hypothesis H1. If it is significantly greater than 0, hypothesis H1 is validated, indicating that returnee executives will promote digital transformation in enterprises, and vice versa And α_3, γ_3 and δ_3 are the key parameters for exploring hypotheses H2 and H3. If these three coefficients are significant, it indicates that the executive pay gap and executive overconfidence play a moderating effect; If $\alpha_1, \gamma_1, \delta_1$ and $\alpha_3, \gamma_3, \delta_3$ are the same, it indicates that the executive pay gap and executive overconfidence have a positive moderating effect, while the opposite still holds true.

5. Empirical analysis

5.1. Descriptive statistical analysis

Table 2 reports the descriptive statistical results of the main variables. The average value of enterprise digital transformation (DCG) is 1.536, with a standard deviation of 1.403, a maximum value of 5.136, and a minimum value of 0, indicating that there are significant differences in the degree of digital transformation among sample enterprises, and most enterprises have relatively low levels of digital transformation. The average proportion of overseas returnee executives (Oversea) in enterprises is 0.0740, indicating that Chinese companies as a whole have not introduced a large number of executives with overseas backgrounds. The average values of internal executive compensation gap (Gap1) and external executive compensation gap (Gap2) are 0.719 and 0.601, respectively, indicating that the executive compensation gap in Chinese enterprises is relatively small. The average value of executive overconfidence (OC) is 0.462, indicating that overall, there are fewer companies where executives have overconfidence psychology.

Table 3 reports the Pearson correlation coefficients between the main variables. The results of the multicollinearity test for each variable in the model show that the mean variance inflation factor is 5.91, which is less than the empirical threshold of 10, indicating that there is no severe multicollinearity in the above model settings. The core variable we focus on is the positive correlation between enterprise digital transformation and overseas returnee executives, which is significant at the 1% significance level. Considering that the above observation results do not take into account the heterogeneity characteristics of individual companies, industries, time, and other possible factors that may affect the relationship between the two, regression analysis will be used to further test and explore.

Table 2 Descriptive Statistics

Variable	Sample size	Average value	Standard deviation	Minimum value	Maximum value
DCG	26,457	1.536	1.403	0	5.136

Oversea	26,457	0.0740	0.151	0	0.833
Gap1	26,457	0.719	0.663	0.101	3.987
Gap2	26,457	0.601	0.767	0.00473	4.411
OC	26,457	0.462	0.499	0	1
REC	26,457	0.128	0.102	0.000739	0.456
Growth	26,457	0.159	0.345	-0.488	1.824
Invest	26,457	0.0593	0.0604	0.000809	0.312
Board	26,457	2.115	0.194	1.609	2.639
Top10	26,457	58.39	14.93	24.97	90.27
TobinQ	26,457	2.091	1.305	0.850	8.095

Table 3 Correlation analysis of main variables

Variable	DCG	Oversea	Gap1	Gap2	OC	REC	Growth	Invest	Board	Top10
Oversea	0.084									
Gap1	0.152	0.179								
Gap2	0.134	0.164	0.977							
OC	-0.018	-0.205	-0.003	0.087						
REC	0.198	0.050	-0.044	-0.047	-0.006					
Growth	0.023	0.029	0.061	0.065	0.002	0.061				
Invest	-0.088	0.053	0.057	0.067	-0.027	-0.118	0.224			
Board	-0.069	-0.057	0.077	0.089	-0.235	-0.105	-0.019	-0.028		
Top10	-0.043	0.041	0.041	0.046	-0.008	-0.072	0.081	0.153	0.014	
TobinQ	0.051	0.038	-0.003	-0.007	0.109	0.031	0.082	0.022	-0.116	-0.083

5.2. Regression analysis

Column (1) of Table 4 shows the empirical results of overseas executives on the digital transformation of enterprises under controlled variables. Column (1) shows that the regression coefficient of returnee executives is significant at around 1%, indicating that returnee executives have a positive impact on the digital transformation of enterprises. This suggests that the higher the proportion of executives with overseas experience in the executive team, the higher the level of digital transformation of the enterprise. Therefore, H1 has been validated.

Table 4, column (2) shows that the coefficient of the interaction term (Oversea × Gap1) between overseas returnee executives and internal executive compensation gap is significantly negative. This indicates that as the internal compensation gap among executives increases, the positive impact of returnee executives on the digital transformation of enterprises will weaken, and H2a has been

validated. Table 4 column (3) shows that the coefficient of the interaction term (Oversea × Gap2) between overseas returnee executives and external executive compensation gap is significantly negative. This indicates that as the external compensation gap for executives increases, the positive impact of returnee executives on the digital transformation of enterprises will weaken, and H2b has been validated. Table 4 column (4) shows that the coefficient of the interaction term (Oversea × OC) between returnee executives and executive overconfidence is significantly negative. This indicates that as the confidence level of executives increases, the positive impact of returnee executives on the digital transformation of enterprises will weaken, and H3 has been verified.

Table 4 Benchmark Regression Analysis

Variable	(1) DCG	(2) DCG	(3) DCG	(4) DCG
Oversea	0.605*** (11.31)	0.483*** (8.98)	0.510*** (9.50)	0.639*** (11.68)
Gap1		0.397*** (32.38)		
Oversea × Gap1		-0.394*** (-7.29)		
Gap2			0.299*** (26.57)	
Oversea × Gap2			-0.262*** (-5.54)	
OC				0.045*** (3.31)
Oversea × OC				-0.286*** (-3.35)
REC	0.181* (1.65)	0.202* (1.88)	0.207* (1.92)	0.188* (1.72)
Growth	0.087*** (6.00)	0.067*** (4.77)	0.072*** (5.04)	0.086*** (5.98)
Invest	-0.891*** (-8.11)	-0.843*** (-7.85)	-0.897*** (-8.29)	-0.884*** (-8.04)
Board	0.075 (1.53)	0.024 (0.51)	0.032 (0.67)	0.090* (1.83)
Top10	-0.014*** (-20.64)	-0.011*** (-16.65)	-0.013*** (-18.46)	-0.014*** (-20.52)
TobinQ	-0.048*** (-9.19)	-0.040*** (-7.87)	-0.045*** (-8.67)	-0.049*** (-9.26)
Firm FE	Yes	Yes	Yes	Yes
Constant	2.280*** (20.97)	1.928*** (18.05)	2.098*** (19.57)	2.221*** (20.19)
Observations	26457	26457	26457	26457
R-squared	0.035	0.078	0.064	0.036

Note: The t-statistic adjusted for the robust standard error of enterprise level clustering is shown in parentheses; Adjusting "*", "* *", "* * *" respectively indicates significance at the 10%, 5%, and 1% significance levels, the same applies below.

5.3. Endogenous test

Although the regression results in column (1) of Table 4 confirm that overseas executives can promote digital transformation of enterprises, there may be potential endogeneity issues due to rigor considerations: there may be a causal relationship between returnee executives and enterprise digital transformation (Cao Huiping, 2023), as companies with high levels of digital transformation have better future prospects and place more emphasis on change and innovation. Talents with international perspectives and advanced knowledge, such as returnee executives, are easily attracted to companies with higher growth potential and greater flexibility in the future. Therefore, the potential for endogeneity issues can easily lead to biased research conclusions in column (1) of Table 4. Based on this, this article uses the instrumental variable method to address potential endogeneity issues.

This article refers to the research method of Dai Yunhao and Kong Dongmin (2017). If the headquarters of a company is located in a province or municipality where Britain established colonies or concessions in the late Qing Dynasty, the value of the enterprise is set to 1. Otherwise, it is set to 0 and recorded as British Colonies. Specifically, these provinces are Fujian Province, Hubei Province, Jiangxi Province, Jiangsu Province, Guangdong Province, Shandong Province, Tianjin City, and Shanghai City. The reason for choosing this variable is twofold: firstly, these regions are more susceptible to the influence of Western culture and values, and overseas returnee executives tend to prefer working in areas with a similar cultural atmosphere as overseas; On the other hand, it is unrelated to the daily production and operation activities of the enterprise and will not have a direct impact on the degree of digital transformation of the enterprise. Therefore, theoretically speaking, this variable should not be able to have an impact on the digital transformation of enterprises through other pathways except for returnee executives, and it better meets the basic conditions of correlation and exclusivity that instrumental variables need to possess. The two-stage GMM regression results are shown in Table 5, and the regression results indicate that the coefficient between returnee executives and corporate digital transformation remains significant.

Table 5 GMM Estimation Results

Variable	DCG
Oversea	0.701***
	(12.58)
REC	2.418***
	(28.92)
Growth	0.102***
	(4.06)
Invest	-1.750***
	(-12.04)
Board	-0.313***
	(-7.16)
Top10	-0.002***
	(-3.30)
TobinQ	0.038***
	(5.80)
Constant	1.955***
	(18.89)
Observations	26457
R-squared	0.054

5.4. Robustness analysis

5.4.1. Replacing Estimation Models

Considering the advancement of technology in domestic enterprises over time and the support of national policies for digital transformation, the degree of digital transformation of enterprises has increased, which will make it easier to attract more overseas talents. Therefore, in order to prevent the influence of omitted variables at the time level, a two-way fixed effects model of company and year is adopted to re-examine the model. The results of columns (1), (2), (3), and (4) in Table 6 show that there is no significant change in the regression coefficients and significance of each major variable. The moderating effects of executive pay gap and executive overconfidence are still significant, and the regression results are consistent with the original empirical results. The test results still support the research hypothesis mentioned earlier.

5.4.2. Increase control variables

Referring to the research of Zhang Hui and Huang Qunhui (2024), adding executive team feature variables to the model to reduce the impact of omitted variables, including the average age of the executive team (Meanage), adding 1 to the average age of the executive team and taking the natural logarithm; Mean tenure of the executive team, add 1 to the average tenure of the executive team and take the natural logarithm, as well as the gender of the executive team. The results of columns (5), (6), (7), and (8) in Table 6 show that the regression results and significance of the main variables are roughly the same as the regression results in the previous section. The moderating effects of executive pay gap and executive overconfidence are still significant, and the test results still support the hypothesis in the previous section.

Table 6 Robustness test

Variable	Replacing Estimation Models	Increase control variables
	DCG	DCG
Oversea	0.143***	0.561***
	(2.91)	(10.41)
control variable	YES	YES
Year	YES	NO
Firm FE	YES	YES
R-squared	0.209	0.054

Note: Due to space constraints, only the regression results of the main explanatory variables are listed in the table.

6. Further analysis

6.1. Heterogeneity Analysis of Technological Attributes

Compared to non-high-tech enterprises, high-tech enterprises have stronger technological research and development capabilities, more advanced information technology infrastructure, and the "technology spillover" of returnee executives, providing solid technical support for the digital transformation of enterprises. At the same time, high-tech enterprises have a higher level of internal risk-taking, open personality characteristics, and flexible governance models, which make them willing to embark on the path of digital transformation and improve their transformation performance. Therefore, overseas returnee executives have a stronger promoting effect on the digital transformation of high-tech enterprises.

According to the technological attributes, the sample was divided into two sub samples: high-tech enterprises and non-high-tech enterprises, and regression analysis was conducted separately. The results are shown in columns (1) and (2) of Table 7. The results showed that the regression coefficient of the high-tech enterprise sample group's overseas returnee executives (Oversea) was 0.762, which was significant at the 1% significance level, while the regression of the non-high-tech enterprise sample group was significant, but the regression coefficient and significance level were much lower than those of the high-tech enterprise sample group, verifying the theoretical analysis results mentioned above.

6.2. Heterogeneity Analysis of Marketization Degree

In regions with lower levels of marketization, an international perspective is more important for businesses, as these regions may lack experience and knowledge to align with international standards. The international background of returnee executives enables companies to introduce new technologies and advanced management methods, thereby better promoting digital transformation of the enterprise. Therefore, in areas with low marketization, overseas returnee executives have a greater impact on the digital transformation of enterprises.

Divide the enterprise sample into two sub samples with high and low levels of marketization, and conduct regression analysis separately. The results are shown in columns (3) and (4) of Table 7. The results showed that the regression coefficient of the low marketization group of overseas returnee executives (Oversea) was 0.835, which was significant at the 1% significance level, while the regression coefficient and significance level of the high marketization group were significantly lower than those of the low marketization group, verifying the theoretical analysis results mentioned above.

6.3. Heterogeneity Analysis of Regional Characteristics

The economic development level in the eastern region is higher than that in the central and western regions, which enables enterprises in the eastern region to better attract and retain overseas returnee executives. At the same time, due to the fierce market competition in the eastern region, overseas returnee executives can more comprehensively utilize their theoretical knowledge, management experience, and social network, thereby having a profound impact on the digital transformation of enterprises. Therefore, in the eastern region, overseas returnee executives have a greater impact on the digital transformation of enterprises.

Divide the enterprise sample geographically into two sub samples, Eastern and Central Western, and conduct regression analysis separately. The results are shown in columns (5) and (6) of Table 7. The results showed that the regression coefficient of the sample group of overseas returnee executives (Oversea) in the eastern region was 0.782, which was significant at the 1% significance level, while it was not significant in the sample group in the central and western regions, verifying the theoretical analysis results mentioned above.

Table 7 Heterogeneity Analysis

Variable	high-tech	non-high-tech	low marketization	high marketization	eastern region	central and western regions
	(1)	(2)	(3)	(4)	(5)	(6)
	DCG	DCG	DCG	DCG	DCG	DCG
Oversea	0.762***	0.249**	0.835***	0.241***	0.782***	0.180
	(8.35)	(2.32)	(7.81)	(2.70)	(9.70)	(1.26)
control variable	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
R-squared	0.049	0.019	0.025	0.047	0.043	0.019

7. Research conclusions and policy recommendations

This article takes non-financial and non real estate listed companies in China's Shanghai and Shenzhen stock markets from 2013 to 2022 as research samples, and uses executive pay gap and executive overconfidence as moderating variables to explore the relationship between returnee executives and corporate digital transformation from both theoretical analysis and empirical testing. The research results show that: firstly, returnee executives have a significant positive impact on corporate digital transformation, and introducing executives with overseas backgrounds can effectively help companies promote their digital transformation process. Secondly, the moderating effect indicates that the internal and external salary gap and overconfidence of executives will negatively moderate the positive relationship between returnee executives and the digital transformation of enterprises. Thirdly, the promotion effect of overseas returnee executives has a greater impact on high-tech enterprises than on non-tech enterprises, a greater impact on enterprises in low marketization areas than on those in high marketization areas, and a greater impact on enterprises in the eastern region than on those in the central and western regions.

Based on the above conclusions, this article proposes policy recommendations to address the challenges of digital transformation in enterprises. One is to actively utilize the high-quality human resources of overseas returnee executives, especially for high-tech enterprises, low marketization areas, and enterprises in the eastern region; At the same time, reasonable care and support should be given to overseas returnee executives, incentive policies should be formulated, and a good working environment should be provided to enable them to play a more comprehensive role in the digital transformation process of enterprises. The second is to optimize the salary structure, regularly review and adjust the executive salary structure, ensure that the internal and external salary gap is within a reasonable range, in order to improve team cohesion and work efficiency; We also need to strengthen the correlation between compensation and performance, quantitatively evaluate the performance of executives in the digital transformation process through regular performance evaluations, and adjust compensation levels accordingly. The third is to provide leadership training and psychological counseling for the executive team, learning how to more accurately evaluate their own abilities and judgments; At the same time, data-driven and evidence-based decision-making methods are introduced to ensure that the digital transformation decision-making process is based on objective analysis and sufficient discussion, in order to reduce the impact of personal bias and overconfidence, and promote the smooth progress of digital transformation.

Reference

[1] Donald C. Hambrick and Phyllis A. Mason.Upper Echelons: The Organization as a Reflection of Its Top Managers[J]. The Academy of Management Review. 1984, Vol.9(No.2): 193-206.

[2] Hellmann T, et al. Incentives and innovation inside firms: a multitasking approach[J].American Economic Journal: Microeconomics. 2011, 3(1):78-128.

[3] Hofstede, G.Email Author View Correspondence (jump link).What is culture? A reply to Baskerville(Article)[J]. Accounting, Organizations and Society. 2003, Vol.28(No.7-8): 811-813.

[4] Ulrike Malmendier, Geoffrey Tate.Who makes acquisitions? CEO overconfidence and the market's reaction[J]. Journal of Financial Economics. 2007, Vol.89(No.1): 20-43.

[5] Yuanhai Bai. Research on the Impact of Overseas Executive Experience on Corporate Digital Transformation: An Analysis Based on the Moderation Effect of Analyst Attention [D]. Guangxi University. 2023.

[6] Huiping Cao, Yunfei Ma, Yifan Ding. Overseas executives and digital transformation of enterprises: empirical evidence from Chinese A-share listed companies [J]. Financial Development Research, 2023, (Issue 9): 22-30.

[7] Yunhao Dai, Dongmin Kong. Can overseas experience of executives improve investment efficiency of enterprises? [J]. Copy of Newspaper and Publication Materials (Enterprise Management Research), 2017, (Issue 5): 66-80.

[8] Li Dong. Economic Policy Uncertainty, Managerial Confidence, and Enterprise Investment Efficiency [J]. Statistics and Decision making, 2021, (Issue 10): 165-169.

[9] Baoxue Fan, Zhao Liu. Managerial overconfidence, controlling shareholder equity pledge, and investment efficiency [J]. Journal of Harbin University of Commerce (Social Sciences Edition), 2022, (Issue 2): 85-96.

[10] Haifeng Gu, Huiping Zhu. Does the executive compensation gap promote corporate innovation investment? Evidence from Chinese A-share listed companies [J]. Accounting Research, 2021, (Issue 12): 107-120.

[11] Jing Hao, Feng He, Bowen Wang . Overconfidence of executives and technological innovation in listed companies: from the perspective of corporate financialization. Systems Engineering Theory and Practice, 2023, (Issue 3): 725-739.

[12] Jin Xiaoshu. Overseas experience of executives and digital transformation of enterprises [J]. Business and management.

[13] Huiguo Lang. External Salary Gap, Corporate Growth Capability, and Executive Resignation [J]. Finance and Accounting Newsletter, 2023 (Issue 22): 59-62, 68.

[14] Dan Li, Jing Qiu. External executive compensation gap and digital transformation [J]. Finance and Accounting Communication, 2023, (Issue 17): 57-61.

[15] Yu Li, Tingting Wang. The impact mechanism and peer effect of executive teams on the generation of digital capabilities in manufacturing enterprises [J]. China Soft Science, 2024, (Issue 2): 178-189.

[16] Sitong Liu, Qiluan Zhang, Yanxi Li. Can the internal salary gap among executives curb corporate risk-taking? [J] Research Management, 2018, (Issue A1): 189-199225.

[17] Jianbo Niu, Shengnan Li, Yulong Yang, Chenxiao Dong. Executive Compensation Gap, Governance Models, and Corporate Innovation [J]. Management Science, 2019, (Issue 2): 77-93.

[18] Jianbo Song, Wen Wen, Dehong Wang. Can returnee executives promote corporate risk-taking: empirical evidence from Chinese A-share listed companies. Finance and Trade Economics, 2017, (Issue 12): 111-126.

[19] Fangcheng Sun, Fuqi Ma, Cheng Zeng. Heterogeneity of executive teams and digital transformation of enterprises: a discussion on the moderating effect of equity incentives and customer demand uncertainty [J]. Business Accounting, 2023, (Issue 5): 4-13.

[20] Xuan Tang, Xing Gao, Tianqi Zhao, Shengtao Ding. Heterogeneity of Executive Teams and Digital Transformation of Enterprises [J]. China Soft Science, 2022, (Issue 10): 83-98.

[21] Tao Wang, Xingyue Wang, Qiaogen Feng. Research on the Impact of Female Executive Participation on Enterprise Digital Transformation [J]. Journal of Management.

[22] Haojun Wang, Yushu Lu, Tiebo Song. Seeking change while maintaining stability? Stability of Executive Teams and Digital Transformation of Enterprises [J]. Research and Development Management, 2023, (Issue 2): 97-110.

[23] Ran Wang, Yu Li. Does the internal salary gap among executives affect corporate risk-taking? "Finance and Accounting Monthly, 2022, Issue 6: 55-64.

[24] Xiaoyan Wang, Ce Zhang. The Impact of Executive Compensation Gap on Corporate Innovation Efficiency: Empirical Analysis Based on Listed Companies [J]. Friends of Accounting, 2020, (Issue 12): 112-118.

[25] Yuting Wei, Minghai Yang. How executive team shared experience affects enterprise digital transformation [J]. Financial Science, 2024, (Issue 2): 136-148.

[26] Chengcheng Wu, Xuan Li. Financial Abundance, Heterogeneity of Executive Teams, and Digital Transformation of Enterprises: Empirical Evidence from Listed Manufacturing Companies in the Yangtze River Delta [J]. Journal of Shijiazhuang Railway University (Social Sciences Edition), 2024, (Issue 1): 34-42.

[27] Fei Wu, Huizhi Hu, Huiyan Lin, Xiaoyi Ren. Digital Transformation of Enterprises and Capital Market Performance: Empirical Evidence from Stock Liquidity [J]. Management World, 2021, (Issue 7): 130-144, 10.

[28] Yuhui Wu, Teng Zhang, Libin Qin, Hengmiao Bao. Executive Information Technology Background and Enterprise Digital Transformation [J]. Economic Management, 2022, (Issue 12): 138-157.

[29] Jian Xiao. Research on the Impact of Overseas Background of Executive Teams on Enterprise Digital Transformation [D]. Northeastern University of Finance and Economics. 2022.

[30] Jinghua Xiao. Cross system digital transformation and management adaptability change of enterprises [J]. Academic Digest of Humanities in Higher Education, 2020, (Issue 4): 208.

[31] Zhen Yang, Jin Chen, Huichen Shang. What kind of experience drives digitalization: academic experience of executives and digital transformation of enterprises [J]. Economic Issues, 2022, (Issue 10): 1-11.

[32] Haobin Yu. CEO overconfidence, managerial autonomy, and corporate debt default [J]. Friends of Accounting, 2023, (Issue 7): 47-56.

[33] Ran Yuan, Hao Wei. Overseas experience of executives and internationalization of Chinese enterprises [J]. Finance and Trade Research, 2022, (Issue 5): 73-85.

[34] Hui Zhang, Qunhui Huang. Can returnee executives drive digital transformation of enterprises? [J] Scientific Research, 2024, (Issue 4): 778-796.

[35] Tao Zhang, Huimin Han. How executive overseas experience affects corporate digital transformation: an empirical study based on branding theory [J]. Contemporary Financial Research, 2023, (Issue 4): 38-50.