

The Impact of Executives' Overseas Backgrounds on the Digital Transformation of Enterprises

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Abstract: With the emergence of the "wave of returning to China" and the continuous introduction of a series of talent introduction policies by the country, talents with overseas backgrounds have begun to hold key positions in the top management of enterprises, and their impact on the development of Chinese enterprises has received widespread attention. This article selects A-share listed companies in Shanghai and Shenzhen from 2007 to 2021 as samples to empirically examine the impact of overseas backgrounds of executives on digital transformation of enterprises. Research has found that executives with overseas backgrounds can promote digital transformation in enterprises. Mechanism testing found that executives with overseas backgrounds promote digital transformation of enterprises by enhancing their innovation capabilities and reducing agency costs. Expanded research has found that the promoting effect of overseas executives on digital transformation of enterprises is more pronounced in state-owned, low information asymmetry, and small and medium-sized enterprises. The conclusion of this article not only enriches the influencing factors on the driving force of enterprise digital transformation, but also provides valuable evidence for enterprises on how to accurately position and attract management elites, as well as plan future development.

Keywords: Overseas Executives, Digital Transformation, Enterprise Innovation Capability, Agency Cost.

1. Introduction

As a fresh wave of technological and industrial upheaval unfolds globally, digital technology has seamlessly integrated into diverse sectors of our nation's economy and societal fabric. This integration not merely exerts a profound influence on individuals' productivity, lifestyles, and cognitive paradigms, but also serves as a formidable catalyst for propelling our economy towards high-quality growth trajectories. The pervasive presence of digital technology reshapes the very essence of human endeavors, fostering innovation and efficiency in ways unprecedented, thereby ensuring sustainable progress and prosperity for our society.[1]. The 20th National Congress of the CPC underscored the urgency to expedite digital economy growth, fostering seamless integration with the real economy, and intensifying efforts towards realizing a digital China, as highlighted in the "2023 China Digital Economy Development Research Report." released by the China Academy of Information and Communications Technology shows that in 2022, the scale of China's digital economy will be 50.2 trillion yuan, experiencing a nominal growth rate of 10.3% year-on-year, accounting for 41.5% of

GDP, which is equivalent to the proportion of the secondary industry in the national economy. As the micro foundation of the digital economy, enterprise digital transformation is the process of digital technology gradually penetrating into the main body of enterprises, using disruptive innovation characteristics to reshape enterprise operation models, and forming new business forms and models [2]. However, digital transformation of enterprises Represents a lengthy, unpredictable, and hazardous investment undertaking that will be influenced by many factors. Even with the support of national macro policies, some enterprises still face transformation difficulties such as "unwilling to transform", "afraid to transform", and "unable to transform". The central government's attention and institutional construction have not played a sufficient incentive role [3]. In line with Accenture's "2024 China Enterprise Digital Transformation Index" report, the average score for digital transformation of Chinese enterprises is only 46, an increase of 2 points from the previous year. This indirectly verifies that most Chinese enterprises are not fully prepared for the changes in digital transformation, and overall, The maturity of digital transformation within Chinese enterprises is relatively low and progress is slow. Therefore, how to effectively and accurately break through the bottlenecks of enterprise digital transformation and make it an internal driving force for enterprise development is an important problem that urgently needs to be solved.

Currently, most research has delved into the economic, financial, and technological factors behind the digital transformation of enterprises[4-6]. But there is relatively little inquiry into the interplay among corporate executive teams and digital transformation. In recent years, with the rise of the "returnee wave" and the sequential implementation of pertinent policies such as the "Management Measures for Overseas High level Talent Introduction Plan" by the country, more and more overseas talents choose to return to China for development and enter the management of enterprises as executives or directors, bringing advanced technology and concepts to enterprises and having an important and far-reaching impact on Chinese enterprises. Assessment of the outcomes resulting from overseas executives on business operations mainly involves investment efficiency, risk-taking, innovation capabilities, and other aspects[7-9], with relatively little attention paid to the development of digital applications and physical technologies in enterprises. So, in the context of the urgent need to find solutions for the difficulties encountered in enterprise digital transition and the extensive implementation of "overseas returnee" talents, can talents with overseas backgrounds play a key role in enterprise digital transformation?

Broadly speaking, the path to digital transformation for enterprises is fraught with unpredictable hazards. The relatively advanced state of digital transformation in overseas markets, underpinned by robust capital environments and refined investor relations strategies, underscores a maturity level that often surpasses domestic counterparts. Drawing upon the enduring lens of the imprint theory, overseas professional or academic pursuits deeply imbue individuals with a trifecta of imprints: cognitive, ability, and resource-based, which external fluctuations seldom erase effortlessly. These enduring markers shape long-term decision-making frameworks and behavioral norms upon repatriation to China, fostering a potent internal catalyst [10]. As a result, executives with overseas experience often possess strong self-discipline, information, innovative thinking, and risk response capabilities. They focus on cultivating the company's innovation ability and team innovation atmosphere, which can significantly enhance the company's risk resistance and creative potential in the process of moving towards digitalization. At the same time, overseas executives also have strong awareness of information disclosure and investor relations management capabilities, as well as a vast network of contacts, which can alleviate the negative effects caused by information asymmetry during the digital transformation of enterprises. The presence of a favorable information environment is indispensable for the successful digital transformation that enterprises are undergoing., and strengthen their competitiveness. This study focuses on domestically traded companies listed on China's major stock markets in Shanghai and Shenzhen between 2007 and 2021, examining the influence and

underlying mechanisms of executives' overseas experiences on enterprise digital transformation. Through a combined approach of theoretical elaboration and empirical validation, the article delves into how such international backgrounds shape the digital evolution of these companies.

The core contribution of this article focuses on two dimensions: firstly, at the academic exploration level, previous research has mostly focused on the impact of overseas backgrounds of executives on corporate performance, information disclosure, and innovative behavior, while this article takes a unique approach and innovatively shifts the perspective to analyze the role of executives with cross-border exposure in facilitating corporate digital revamping. Furthermore, by analyzing heterogeneity based on the characteristics of enterprise property rights, scale, and degree of information asymmetry, this article reveals the significant conditions under which overseas executives be instrumental in driving digital transformation forward. The aim is to provide strategic recommendations for accelerating the process of enterprise digital transformation and to open up new perspectives and paths for in-depth interpretation of enterprise digital transformation behavior. Secondly, in terms of practical guidance, given the acceleration of global economic integration, China actively implements the strategy of introducing high-level talents from overseas to enhance the digital economic system and innovative development momentum. In the face of the wave of returning overseas talents, there is still controversy in academia and society about whether it effectively promotes microeconomic prosperity and development. This research empirically underscores the pivotal role of executives with international experience in accelerating enterprise digital transformation. It offers a robust theoretical foundation and a pragmatic framework for talent acquisition and management strategies, fostering a seamless integration between the digital and real economies, thereby advancing towards high-quality economic growth objectives.

2. Research Hypothesis

In recent years, the digital wave has profoundly reshaped business models and consumer behavior. As a key path to promote the deep integration of the digital economy and the real economy, the innovation potential contained in enterprise digital transformation has attracted much attention [11]. However, traditional enterprises still bear heavy pressure and challenges in this transformation process. Digital transformation not only reshapes the market competition landscape, but also intensifies talent competition, among which heterogeneous professional knowledge is regarded as a strategic asset for enterprises to build long-term competitive advantages[12]. The theory of higher-order echelons suggests that corporate strategic decision-making is the result of the interplay between internal and external factors and managerial traits [13]. In the high-risk and highly uncertain strategic decision of digital transformation, enterprises need to overcome complex obstacles in resource acquisition and allocation, and managers are therefore placed in a more complex decision-making environment.

In this context, managers with overseas education and training backgrounds, with their keen sense of technological innovation and innovative confidence, have taken on a pivotal role in facilitating the digital transformation of businesses. These traits enable them to calmly cope with the uncertainty and risks in digital transformation, effectively promoting the efficient allocation of resources. Therefore, when companies seek to optimize their business models and adjust their development directions, executives with overseas backgrounds are expected to play a key role in deeply integrating digital technology into their operations through their unique perspectives and abilities, thereby accelerating and optimizing the organization's shift to digital operations. This inference reveals the intermediary position of international leaders in promoting the shift to digital operations, providing new perspectives and insights for understanding and promoting the digitalization process of enterprises.

1. Mechanism analysis based on enterprise innovation capability. The digital transformation of enterprises ultimately relies on the support of technological innovation. The increased vitality of

technological innovation in enterprises will inevitably be transmitted to digital transformation activities [14]. In addition, enterprises have a strong motivation to shift their technological innovation activities towards digital projects that are currently undergoing a trend of digital transformation, in order to adapt to and conform to the current background of China's digital transformation and the trend of the digital economy [15]. Therefore, the improvement of enterprise technological innovation has a positive driving effect on the the enterprise's digital makeover process. The advanced technology and keen innovation consciousness mastered by executives with overseas backgrounds enable them to accurately identify the technological gap between China and foreign countries, quickly discover and seize innovation opportunities, and thus improve the technological innovation level of enterprises. In addition, executives with overseas backgrounds have a higher willingness to adopt emerging technologies[16], which in turn promotes the digital remodeling process of businesses.

2. Mechanism analysis based on enterprise agency costs. Due to the strong technicality and confidentiality of digital transformation itself, and the high degree of uncertainty that often accompanies the digitalization process, shareholders find it difficult to effectively supervise and manage R&D activities, which exacerbates the problem of information asymmetry between agents [17] and increases agency costs. However, high agency costs and increased opportunistic behavior among the executive team lead to increased conflicts between shareholders and the executive team, resulting in a decrease in investment efficiency and weakening the impact of executives on the digital transformation of the enterprise[18]. In this situation, compared to locally grown executives, executives with overseas backgrounds have rich professional knowledge and industry experience, and can more comprehensively collect and process valuable innovative information [19]. This can effectively suppresses agency costs. In addition, due to the more sound foreign capital markets and better investor relations management, such experiences have a positive driving effect on the improvement of personal abilities and thinking patterns, making executives with overseas backgrounds more familiar with the skills of foreign companies in information disclosure and investor relations management. They can apply advanced management concepts to the management practices of Chinese companies, improve the quality of information disclosure, and improve investor relations management [20]. At the same time, executives with overseas backgrounds have a higher level of risk-taking for the company. Academic experience makes executives more self disciplined and self disciplined, and their noble moral character can effectively alleviate agency problems. The overseas background of executives can better play a strategic decision-making role under low agency costs[21], thereby promoting the transition to digital systems within enterprises.

Based on this, this article proposes the following hypothesis:

H1: Executives with overseas backgrounds can promote the digital systems within enterprises.

H2: Executives with overseas backgrounds mainly contribute to the digital systems within enterprises by enhancing innovation capabilities and suppressing agency costs.

3. Research Design

3.1. Data Sources and Sample Selection

This article selects data from Chinese A-share listed companies from 2007 to 2021 as the initial sample, and filters the data as follows: (1) excludes samples of ST and * ST companies; (2) Exclude samples of financial and real estate enterprises; (3) Delete samples with missing variable observations; (4) The top and bottom 1% extreme values of continuous variables were truncated. After the above screening, a total of 23673 samples were obtained in this article. The data sources for this article are as follows: the overseas background of the executive team and the digital process indicators of the enterprise are manually compiled, and the financial and governance data of the enterprise are obtained from CSMAR and Wind databases.

3.2. Variable Definition

3.2.1. Executive Overseas Background (HAI)

In measuring the overseas background of executives, this article draws inspiration from Chen et al [22] and Song Jianbo uses the percentage of executive members with overseas work or study backgrounds to measure the overseas background of executives.

3.2.2. Enterprise Digital Transformation (Dii)

To comprehensively assess corporate digital transformation levels, this study adopts textual analysis techniques inspired by Li Wanli et al. [23] and Wu Fei et al. [24]. It focuses on analyzing annual reports of listed companies, utilizing text analysis to identify and compile a custom database of key terminology associated with AI, big data, digital applications, blockchain, and cloud computing. Python is employed to isolate and quantify these terms, consolidating their frequencies into a logarithmic index, thereby quantifying the extent of enterprises' digital transformation..

3.2.3. Control Variable

Drawing on previous research, this article introduces a series of control variables: return on assets (ROA, net profit/total assets), enterprise size (Size, natural logarithm of total assets), asset liability ratio (Lev, total liabilities/total assets), board size (Board, natural logarithm of board size), proportion of independent directors (Ind, number of independent directors/total board size), age of establishment, and gross profit margin (growth). This article also controls for year fixed effects (Year) and industry fixed effects (Industry) to control for the impact of annual trends and inter industry gaps.

3.3. Model Building

To examine the effect of executives' foreign exposures, on a given phenomenon on digital transformation, this article constructs the following econometric model:

$$Dii_{i,t} = \alpha_0 + \alpha_1 HAI_{i,t} + Controls_{i,t} + Year + Industry + \varepsilon_{i,t} \quad (1)$$

In model (1), we denote each individual enterprise by 'i' and the year by 't'. The degree of digital transformation achieved by listed company 'i' in year 't' serves as the dependent variable, denoted as Dii. Our primary explanatory variable, HAI, captures the international experience or overseas background of the executives within listed company 'i' during year 't'. To ensure the robustness of our analysis, we incorporate a set of key control variables denoted as 'Controls'. Furthermore, we account for potential year-specific and industry-specific fixed effects through the inclusion of 'Year' and 'Industry' variables, respectively. Lastly, the term 'ε' represents the stochastic error term, capturing unobserved factors that may influence the relationship under investigation.

4. Empirical Analysis

4.1. Benchmark Regression

Table 1 shows the main regression results of this article. Among them, the first column is the result of regression with only the core explanatory variable HAI added, and the regression coefficient of the explanatory variable HAI is 1.5877, which is positively significant at the 1% level. The second column introduces control variables based on model (1), and the regression coefficient of the explanatory variable HAI is 1.3551, which is positively significant at the 1% level. This indicates that under other unchanged conditions, executives with overseas backgrounds can have a positive impact

on the digital transformation of enterprises, which is consistent with expectations. By adding fixed effects of industry and year on the basis of column (2) to column (3), the regression coefficient of HAI is 0.6178. Although the coefficient has decreased slightly, it is still significantly positive at the 1% level, indicating that the research results of this paper are relatively robust.

Table 1: Benchmark regression results

	(1)	(2)	(3)
	Dii	Dii	Dii
HAI	1.5877*** (18.904)	1.3551*** (16.392)	0.6178*** (9.199)
Controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Years FE	Yes	Yes	Yes
N	26432	26432	26432
r ² a	0.0162	0.0633	0.4019

Note: The values in parentheses are t-values, ***, **, and * represent significant at the 1%, 5%, and 10% levels, respectively. The same applies below.

4.2. Mechanism Analysis

Table 2: Mechanism Verification

	(1)	(2)	(3)
	RD	patent	DAI
HAI	0.0329*** (14.120)	0.4672*** (5.687)	-0.0646*** (-3.036)
Controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Years FE	Yes	Yes	Yes
N	26146	26146	26146
r ² a	0.4127	0.4630	0.2471

4.2.1. Enterprise Innovation Capability (RD, patent)

The mechanism analysis in this article aims to examine whether and how executives' overseas experiences affect corporate innovation investment.

Regarding R&D investments, this article adopts Shen Minghui's methodology, which utilizes the proportion of R&D expenditures relative to operating revenues to gauge the allocation of corporate resources towards innovation endeavors. This metric serves as a benchmark for assessing the innovative prowess and capacity of enterprises, providing insights into their commitment to advancing technological developments and fostering creativity. Column (1) reflects. The weight of managerial influence with overseas backgrounds on corporate innovation investment, with a regression coefficient of 0.0329, which exhibits a significantly positive impact at the 1% level. Regarding patent output, the present study adopts the methodology devised by Zhang Xindong and Wu Jing to quantify an enterprise's innovative productivity. This is achieved by initially taking the natural logarithm of the aggregate number of applications submitted for invention and utility model patents within the same calendar year, and subsequently augmenting this value by unity. Through this enhanced approach, the study measures and assesses the innovation output of the enterprise, ensuring a rigorous and academically sound methodology that adheres to established norms. Column (2)

reflects the impact of executives who possess global experiences and business-level innovative yield, displaying a correlation coefficient in the regression model of 0.4672, which is positively significant at the 1% level.

According to the analysis of innovation investment and output in enterprises, one can infer that executives who possess overseas experiences exhibit a favorable correlation with the innovative capacity of an enterprise, thereby fostering a stimulating impact on its development. This conclusion underscores the beneficial role such executives play in enhancing the overall innovative prowess of the organization.

4.2.2. Agency Cost (DAI)

This article employs the asset turnover approach (Turnover), initially introduced by Tong Yong and Shi Qingyi [25], which quantifies efficiency as the ratio of operating revenue to the average total assets held. Notably, this metric functions inversely to the agency dilemma between shareholders and managers; specifically, a diminished agency conflict translates into reduced agency costs, thereby augmenting the asset turnover ratio. In essence, a higher turnover rate signifies a more streamlined operation, reflecting effective management and lower impediments from shareholder-manager disagreements. Column (3) reflects that executives with overseas backgrounds can reduce agency costs, i.e. increase R&D investment, with a regression coefficient of -0.0646, which is significantly negative at the 1% level.

4.3. Heterogeneity Analysis

Table 3: Heterogeneity analysis results

	(1)SOE	(2)Non-SOE	(3)Big Size	(4)Small Size	(5)Strong ASY	(6)Weak ASY
	Dii	Dii	Dii	Dii	Dii	Dii
HAI	0.585***	0.407***	0.573***	0.629***	0.501***	0.614***
	(4.633)	(4.892)	(6.183)	(6.504)	(5.312)	(6.567)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	10457	14608	13216	13216	13253	13179
r ² a	0.378	0.401	0.392	0.418	0.359	0.410

4.3.1. Heterogeneity Analysis Based on the Nature and Scale of Enterprise Property Rights

Considering that as an important factor in controlling business decisions, the ownership arrangement of enterprises will have an impact on the degree of digital transformation of enterprises. In previous studies, the study by Li Siqi et al. [26] shows that state-owned enterprises have significant substantive output in innovation, further demonstrating the differences in resource acquisition and risk-taking capabilities between state-owned and non-state-owned enterprises. The state-owned enterprises, with their stronger financial strength and more stable policy support, can better absorb and utilize the international resources brought by executives' overseas backgrounds, especially in projects such as digital transformation that require significant initial investment and long return cycles. In order to verify the impact of property rights on the relationship between the chairman's overseas background and the company's R&D investment, this paper refers to the research method of Liu Bai et al. [27] and introduces the method of dummy variables to measure the property rights of the company, with

1 for state-owned enterprises and 0 for non-state-owned enterprises. The test results of columns (1) and (2) in Table 4 show that the regression coefficient of state-owned enterprises is 0.0585, which is more significant than that of non-state-owned enterprises, indicating a greater promotion effect on digital transformation.

In addition, compared to large enterprises, Ding Zhong and Deng Kebin [28] found that the increase in government subsidies for small and medium-sized enterprises under the "double innovation" policy can increase their innovation investment; and small-scale enterprises, with limited resources, tend to focus their resources on high potential and high return innovative projects due to the needs of company development. This article introduces the dummy variable "enterprise size", as shown in column (3), and finds that the regression coefficient for small-scale enterprises is 0.629, which is more significant compared to large-scale enterprises.

4.3.2. Heterogeneity Analysis Based on Information Asymmetry

To delve into the mechanisms by which information asymmetry modulates the diversity of digital transformation aptitudes among executives with international experience, this study builds upon the work of Yu Wei et al. [29], crafting a proxy metric for the extent of information asymmetry. Drawing from the extensive literature on financial market microstructure and leveraging granular trading data of individual equities, we construct this metric. Specifically, we extract the primary component from a composite of liquidity ratios, illiquidity measures, and reversal indicators, designating it as ASY, our proxy for information asymmetry. Notably, a lower ASY value signifies a diminished level of information asymmetry, thereby facilitating a more nuanced understanding of its impact on the examined phenomenon. As shown in column (2), with a low degree of information asymmetry, the regression coefficient is 0.614, indicating a significant positive impact on digital transformation for executives with overseas backgrounds.

5. Research Conclusions and Policy Recommendations

5.1. Research Conclusions

Amidst the ascendancy of the big data epoch, digital transformation stands as a pivotal strategy for enterprises to navigate the shifts of this era, transforming into an indispensable path for sustainable growth and bolstering core competitiveness. Drawing upon data spanning Chinese A-share listed firms from 2007 to 2021, this article delves into the intricacies of how executives with international experience impact enterprises' digital transformation journey. The findings reveal that:

Executives boasting international backgrounds exert a noteworthy influence in propelling the digital transformation of enterprises. Specifically, an increased proportion of executives with overseas experience correlates positively with the expansion of enterprises' digital transformation endeavors. In essence, the depth and scale of digital transformation escalate in tandem with the augmentation of executives who have traversed global business landscapes.

Through mechanism analysis, it is found that the overseas background of executives mainly promotes the digital transformation of enterprises by reducing agency costs and increasing innovation capabilities.

Through further research, it was found that under different property rights, state-owned enterprises have a more significant impact on their digital transformation due to policy support such as government subsidies, strong financial strength, and executives with overseas backgrounds; Under different scales of enterprises, small and medium-sized enterprises are supported by the "double innovation" policy in recent years and are influenced by their organizational structure. As a result, their digital transformation capabilities are greater and their intelligent transformation capabilities are stronger; Under different degrees of information asymmetry, the more intense the market competition,

the weaker the information asymmetry, and the stronger the role of executives with overseas backgrounds in promoting the digital transformation of enterprises.

5.2. Policy Recommendations

5.2.1. Optimize talent introduction policies

The government should emphasize the importance of talents and offer incentives for innovation to optimize and upgrade China's enterprise innovation system, enabling leapfrog development. The government's key tasks are to introduce attractive policies to attract overseas talents, build platforms for their connection with local resources, and ensure their smooth integration. Additionally, building a comprehensive policy support system is crucial to overcome cultural barriers, design diverse welfare policies, and enhance returnees' enthusiasm. In summary, creating an environment that encourages overseas talents to return and thrive should be the government's primary focus.

5.2.2. Improve the digital transformation service system and build a public service platform

Enhancing China's digital transformation service system and building a public platform is crucial for economic growth. The platform optimizes resource allocation through data sharing. The government should plan, define roles, and integrate resources from various sectors. Utilizing technologies like big data, cloud, and AI boosts platform intelligence. Ensuring security, privacy, and user satisfaction are key. Continuous feedback-based adjustments optimize services..

5.2.3. Enterprises continuously improve and optimize the executive compensation system

Academic research has shown that moderate adjustment of salary differences within the executive team can effectively promote the activity of corporate innovation activities. Therefore, when formulating and optimizing executive compensation strategies, the management of enterprises should carefully consider the reasonable allocation of salary gaps to maximize their positive incentive effects. In addition, companies can creatively utilize the salary gap to construct incentive mechanisms similar to tournaments, directly linking executive compensation to the ranking of their business performance. This aims to create a positive and healthy competitive environment, motivate executives to engage in innovative investment practices.

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