

# CEOs' Military Experience and the Digital Transformation of Enterprises

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## Abstract

Using Chinese A-share listed companies from 2007 to 2020 as samples, this paper studies the influence of CEOs' military experience on the digital transformation of enterprises. The study found that CEOs' military experience promoted the digital transformation of enterprises; Compared with state-owned enterprises, CEOs' military experience in non-state-owned enterprises can significantly improve the digital transformation of enterprises. The study found that CEOs' military experience promoted the digital transformation of enterprises; Compared with state-owned enterprises, CEOs' military experience in non-state-owned enterprises can significantly improve the digital transformation of enterprises; The higher the marketisation process, the stronger the positive impact of CEO's military experience on the digital transformation of enterprises. After the robustness test of independent variable lag period, propensity score matching method and instrumental variable method, the conclusions of this paper are basically the same as that of the marketisation process. conclusions of this paper are basically unchanged.

## Keywords

**Military Experience; Digital Transformation; Characters of Property Rights; Marketisation Process.**

## 1. Introduction

With the rapid development of the digital economy globally, enterprise digital transformation has become an important driving force for economic development. According to Table 1, "Digital Transformation Index of Chinese Enterprises", the overall digitalisation process of Chinese enterprises has been steadily advancing over the past four years, rising from 37 points in 2018 to 54 points in 2021, and the overall itinerary of digital capacity building has already passed the halfway mark. General Secretary Xi Jinping pointed out that it is necessary to "drive the flow of technology, capital, talent and materials with the flow of information to promote the optimisation of resource allocation and the improvement of total factor productivity". This shows that the digital transformation of enterprises has become a key step for China's economy to steadily move towards high-quality growth.

**Table 1.** Digital Transformation Index of China's Enterprises, 2018-2021

Year	Digital Transformation Index (0-100 points)
2018	37
2019	45
2020	50
2021	54

Source: National Industrial Information Security Development Research Centre, Accenture Business Research Institute.

Enterprise digital transformation has significant value and risk, and requires special attention from the top management team of the enterprise. The CEO, as the leader of the executive team of the enterprise, is also the formulator, decision maker and implementer of the enterprise strategy, whose perception of digital innovation determines the effect of the implementation of the enterprise's digital transformation strategy. In recent years, China has gradually streamlined the size of its military, and in 2015 the Party Central Committee disarmed 300,000 people. Under the support of national policy, a large number of retired military personnel have joined the business world, and a number of outstanding entrepreneurs and executives have emerged. The early acceptance of military culture by CEOs will inevitably lead to significant changes in cognitive perceptions and decision-making preferences, and their decision-making styles will significantly affect the future direction of the enterprise when making corporate decisions. In this context, this paper intends to examine the impact of the military experience of CEOs of listed companies in China on the digital transformation of enterprises. As the top decision-maker and manager of an enterprise, CEOs have a fundamental impact on enterprise digital transformation, and this role significantly depends on the CEO's personal cognitive model and decision-making preferences.

This paper finds that CEOs with military experience significantly and positively influence firms' digital transformation. Examination from the perspectives of the nature of property rights and the process of marketisation reveals that in non-state-owned enterprises, CEOs with military experience have a more significant impact on enterprise digital transformation; the process of marketisation enhances the impact of CEOs with military experience on enterprise digital transformation. The findings of this paper confirm the important role of CEOs' military experience on the digital transformation of enterprises listed in China, which, on the one hand, highlights the importance of the military culture on corporate decision-making and complements the academic evidence in this area. On the other hand, it provides new research ideas on the influencing factors of corporate digital transformation.

The remainder of the paper is structured as follows: the second part is a literature review, the third part is the research hypotheses, the fourth part is the research design, the fifth part is the empirical results, the sixth part is the robustness analysis, and the seventh part is the conclusion.

## 2. Literature Review

### 2.1. Military Experience

Stigma theory states that early experiences in an individual's development affect their future values and cognitive abilities, and although this stigma may only be in effect for a short period of time, it has a huge impact on an individual's behaviour, which is not easily eliminated even if the environment in which the individual is exposed to later in life is radically altered (Marquis and Tilcsik, 2013) [1]. Higher order theory suggests that the economic, political and cultural factors of the environment in which a business manager is born and grows up can have an impact on his or her decision making. For companies, the managing director is the key to determining the company's decision-making and corporate strategy, and plays a pivotal role in the future development of the company (Bamber et al., 2010)[2]. In recent years, military experience has received increasing attention from scholars because of its shaping of their risk appetite and individual values. Existing research on managers' military experience mainly focuses on two perspectives: risk appetite and moral values.

Much of the existing literature has examined managers' risk preferences from the perspective of those with military experience. On the one hand, it has been argued that military experience makes managers more aggressive in their risk preferences and more risk-taking. Empirical data from Wansink et al. (2008) [3] suggest that soldiers who participated in World War II have a

greater tendency to make risky decisions, and that managers with military experience are more likely to engage in mergers and acquisitions and tend to favour high debt ratios, leading to poorer firm performance. Malmendier et al. (2011) [4] found that managers with military experience, especially those who experienced war, tend to choose a capital structure with a high debt ratio. Domestic scholars have also found that the companies of managers with military experience have higher levels of risk-taking (Ye Jianhong, 2017) [5], tend to choose high-debt, high-risk financial decisions (Lai Lai et al. 2016; Zhao Minwei and Yan Yanyang, 2016; Yan Yanyang and Zhao Minwei, 2016) [6,7,8] as well as mergers and acquisitions (Lai Lai et al. 2017) [9], and more tolerant of high-risk R&D and innovation activities (Chen Weihong, 2019; Quan Xiaofeng et al. 2019; Shao Lin, 2019) [10,11,12].

On the other hand, there is also some literature that suggests that managers with military experience are more conservative and robust. Bamber et al. (2010) [2] found that managers with military life experience prefer robust and accurate disclosure. Luo Jinhui et al. (2017) [13] data examined that managers with military experience are more concerned about decision errors that lead to the failure of the company's operations, thus choosing to be more prudent and conservative in the face of R&D investment activities. Wang Yuanfang and Xu Yekun (2019) [14] found that military experience makes managers more conservative rather than more aggressive, and the level of risk-taking in their firms is significantly lower.

In addition to this, it has been argued that managers with military experience are more inclined to follow discipline, avoid breaking the law, express aversion to uncivilised behaviour, reduce the probability of unethical behaviour in their companies, and promote long-term business development. Özlen (2014) [15] argues that CEOs who have undergone rigorous training in the military have stronger ethical beliefs, and place greater emphasis on responsibility, dedication and self-sacrifice. Biggerstaff et al. (2015) [16] found that unethical corporate culture stems from the values and behaviours of company executives. Benmelech and Frydman (2015) [17] Firms led by military CEOs demonstrate stronger ethical principles in the capital market and are less likely to be involved in fraud cases. Law and Mills (2017) [18] argue that CEOs who have undergone military service hones an individual's moral integrity and refuses to break the law. The results of their study show that the companies of CEOs with military experience are less likely to commit unethical behaviours such as tax evasion, financial restatement, surplus management, and irregularities, indicating that CEOs with military experience adhere to rules and order. Lin et al. (2011) [19] argued that managers' loyalty and integrity are shaped in the army, which helps to mitigate agency problems in mergers and acquisitions and reduces the agency costs, resulting in higher M&A performance. Xie and Hao (2017) [20] found that firms run by military executives assumed more social responsibility and reduced the level of surplus management. Luo et al. (2017) [21] argued that the amount of charitable donations by firms governed by executives with military experience is lower, suggesting that managers with military experience do not want to donate to achieve strategic purpose. Domestic scholars have also reached similar conclusions, Quan Xiaofeng et al. (2018) [22] believe that the excellent quality shaped by managers' military experience reduces the company's agency risk, litigation risk, and information risk, and their companies are more likely to be recognised by auditors. Wang Yuanfang and Xu Yekun (2020) [23] draw similar conclusions, and their findings show that chairmen with military experience adhere to discipline, create a good governance culture and environmental safeguards, have higher ethical standards, and are effective in reducing surplus management as well as obtaining better audit opinions. Cai Sanxi and Ou Jianyou (2019) [24] concluded that managers with military experience have a sense of social responsibility, high ethical awareness and values, which are conducive to curbing executive pay stickiness.

In summary, there is a rich body of research on military experience, but there is still no literature on the relationship between military-experienced CEOs and corporate digital transformation.

## 2.2. Digital Transformation of Enterprises

The existing literature has not yet agreed on the following two main aspects of the exploration of digital transformation of enterprises for high quality development of enterprises.

On the one hand, some scholars believe that enterprise digital transformation contributes to the long-term development of enterprises. Büchi (2018)[25] points out that the application of digital technology promotes the mass production mode, improves production efficiency, and reduces production costs, which in turn promotes the improvement of enterprise performance. Rialti (2019) [26] points out that digitisation enables enterprises to rapidly launch new technologies and products, and to occupy a favourable position in the market. He Fan and Liu Hongxia (2019)[27] found that the digital transformation of enterprises has strongly improved the quality of the real economy's operation. From this perspective, digital transformation gives enterprises greater economic vitality and can create certain positive feedback in the capital market.

On the other hand, there are scholars who argue that digital transformation of firms does not contribute to the long-term development of firms. Ekata (2012) [28] conducted a study using data from Nigerian banks and found that the benefits of digital transformation are offset by its derived management costs, bringing relatively limited positive effects. Hajli et al. (2015) [29] argued that the digital transformation to drive high-quality development of firms is only important for not for all firms established, finding that a significant portion of firms do not benefit from it. Chi Yudong and Cai Chengwei (2020)[30] pointed out that there is a certain matching lag between the management capability of listed companies and the technological development of digital transformation in time, which makes the hidden costs of enterprise digital transformation high (Xu Mengzhou and Lv Tie, 2020) [31]. Based on the above findings in the literature, it can be inferred that digital transformation may not contribute to the increase in the active performance of firms in the capital market.

Currently, there is a relative lack of research on the factors influencing the digital transformation of enterprises, and this paper examines the impact of the digital transformation of enterprises from the perspective of the CEO's experience in the military.

## 3. Research hypotheses

### 3.1. CEO's Military Experience and Enterprise Digital Transformation

There are two main ways in which the CEO's experience in the military affects the digital transformation of an organisation.

On the one hand, the inertia and behavioural norms formed by CEOs during their early service in the army will continue to influence their decision-making performance after they retire from the army and join the business world. President Xi Jinping pointed out that "we should unswervingly take informatisation as the development direction of army modernisation". Digitalisation is the necessary foundation of the army's information construction, and it runs through the entire development process of the army's information construction. The world's new military transformation, led by digitalisation, is changing the traditional war pattern and army development mode, and promoting the army's transformation to digitalisation. The main technology of the U.S. military is the development towards digital network-centred warfare (Wong, 2003)[32]. Therefore, military CEOs, who feel the important role of digitalisation in the development of war during their military life, are more likely to apply the model of the military's digital development to their enterprises and promote the digital transformation of their enterprises when they join them after their retirement from the military.

On the other hand, CEOs with military experience are more risk-tolerant and contribute positively to enterprise digital transformation. The basic feature of enterprise digital

transformation is digital innovation, and unlike traditional management, the impact of digital technology is comprehensive and can change the organisational structure, but it is characterised by high risk, high investment, and long cycle time. Army training forms characteristics such as aggressiveness and high risk tolerance of military personnel. The uncertainty of the environment in training trains military personnel in crisis response, and the fulfilment of difficult tasks reinforces their estimation of their capabilities. CEOs with military experience will be more likely to show high enthusiasm for the project of digital transformation of the enterprise and thus contribute positively to the digital transformation of the enterprise compared to CEOs without military experience.

Therefore, the following hypothesis is proposed in this paper:

H1: CEO experience in the military can significantly and positively influence firms' digital transformation.

### 3.2. Impact of the Nature of Property Rights

Differences in property rights are a key feature of China's market economy, and there are significant differences between firms with different property rights, so there may also be differences in the role of the CEO's experience in the military in influencing the digital transformation of firms with different property rights. On the one hand, SOEs may be subject to more scrutiny, not only by the public but also by the SASAC. Compared with non-state-owned enterprises, state-owned holding companies take on more social functions, and their behaviours are subject to doubled public scrutiny and face more administrative supervision and public opinion pressure. As a result, state-owned enterprises will be subject to more ideological constraints when faced with the decision to digitally transform their enterprises. On the other hand, SOE executives with outstanding achievements may be promoted at the right time and enter government departments at all levels (Du Xingqiang et al., 2011)[33]. The promotion mechanism of SOE managers is constrained by the pressure of political promotion and fixed tenure, and they are more in pursuit of stable operation, and they show more caution in making business decisions such as digital transformation of enterprises, which is risky, long-cycle, and high uncertainty. In summary, this paper proposes the following hypotheses:

H2: The impact of CEOs' military experience on firms' digital transformation is more significant in non-state-owned firms compared to state-owned firms.

### 3.3. Impact of the Marketisation Process

Given that the external environment of a company, especially the economic and institutional environment, has greater constraints on the behaviour of the company and can significantly interfere with the behavioural decisions of the company's managers, the impact of the CEO's experience in the military on the digital transformation of the company will also be influenced by factors external to the company. China's various regions are significantly different in terms of resources, policies and systems, so the marketisation process is not the same in different parts of the country. The company's management should be adapted to the local conditions and pay attention to the impact of the marketisation process on the company. Compared with regions with low marketisation processes, companies in regions with high marketisation processes influence the digital transformation of enterprises through factor markets, quality of information disclosure and market competition. On the one hand, the promotion of marketisation reforms helps to nurture and develop factor markets, and facilitates the efficient and rational flow of factors of production, including human resources, capital, and technology, to corporate digital transformation activities. On the other hand, enterprise digital transformation is high-risk, enterprises are often very cautious before implementation, the process of marketisation helps to improve the quality of information disclosure by market players, making market information more transparent, avoiding underestimation of the value

of investment in enterprise digital transformation due to information asymmetry, and providing a good environment for enterprise digital transformation activities. In addition, with the acceleration of the marketisation process, market competition has become more intense, forcing market players to explore enterprise digital transformation.

Therefore, the following hypothesis is proposed in this paper:

H3: Marketisation process enhances the impact of CEOs' military experience on firms' digital transformation.

## 4. Research Design

### 4.1. Sample Selection and Data Sources

In this paper, China's A-share listed companies from 2007 to 2020 are selected as samples, and the initial data are screened as follows: (1) excluding the samples of listed companies in the financial industry; (2) excluding the samples of listed companies with missing data of related variables. In order to reduce the possible effects of extreme values, we have performed a 1 per cent shrinkage of all continuous variables before and after. Financial data are from the CSMAR database.

### 4.2. Model Design and Variable Selection

In order to test H1, H2 and H3, the following regression models (1) and (2) are constructed in this paper:

$$DCG_{i,t} = \beta_0 + \beta_1 CEO_{i,t} + \beta_2 Lev_{i,t} + \beta_3 Board_{i,t} + \beta_4 Ind_{i,t} + \beta_5 Top1_{i,t} + \beta_6 Size_{i,t} + \beta_7 Mag_{i,t} + \beta_8 Growth_{i,t} + \beta_9 Year + \beta_{10} Ind + \varepsilon \quad (1)$$

$$DCG_{i,t} = \beta_0 + \beta_1 CEO_{i,t} + \beta_2 CEO_{i,t} \times Market_{i,t} + \beta_3 Market_{i,t} + \beta_4 Lev_{i,t} + \beta_5 Board_{i,t} + \beta_6 Ind_{i,t} + \beta_7 Top1_{i,t} + \beta_8 Size_{i,t} + \beta_9 Mag_{i,t} + \beta_{10} Growth_{i,t} + \beta_{11} Year + \beta_{12} Ind + \varepsilon \quad (2)$$

Among them, the explanatory variable is enterprise digital transformation (DCG). The frequency of occurrence of the breakdown indicators of AI technology, blockchain technology, cloud computing technology, big data technology, and digital technology applications in the report was summed, and the natural logarithm was taken after adding 1, which was used as a measure of the degree of enterprise digital transformation.

The explanatory variable is the military experience of general managers of listed companies (CEO<sub>Army</sub>). On the basis of the executive resume data in the CSMAR database, and through Sina Finance and other websites, the keywords "military, retired, enlisted, company commander, platoon commander, fleet, PLA" are manually searched in the resume of the general manager to confirm that the general manager has the experience of the military, and then assigned a value of 1, otherwise it is zero.

Referring to previous practices in related literature, this paper selects the following control variables: gearing ratio (Lev), board size (Board), proportion of independent directors (Ind), proportion of shares held by the first largest shareholder (Top1), firm size (Size), proportion of shares held by executives (Mag), growth of the firm (Growth), the process of marketisation (Market), an industry dummy variable (Ind) and a year dummy variable (Year). variable (Ind) and year dummy variable (Year).

The marketisation process (Market) was chosen to be measured by the Marketisation Index from the China Sub-Provincial Marketisation Index Report (2018) compiled by Wang Xiaolu et al. The data for 2016 extends to 2020.

The variable codes and variable definitions are shown in Table 2. To control for model heteroskedasticity, Robust regression is used in this paper for all models.

**Table 2.** Variable definitions

variable code	variable name	Variable Definition
DCG	Enterprise Digital Transformation	The sum of the frequency of the subindicators for Artificial Intelligence Technology, Blockchain Technology, Cloud Computing Technology, Big Data Technology, and Digital Technology Applications appearing in the report, plus one to take the logarithm.
CEOarmy	General Manager's military experience	Dummy variable, 1 for having military experience, 0 otherwise
Board	Board size	Natural logarithm of the number of board members
Top1	shareholding concentration	Shareholding ratio of the largest shareholder
Size	Enterprise size	Natural logarithm of total assets of the enterprise at the end of the year
Lev	gearing	Total liabilities to total assets
Mag	Executive Shareholding Ratio	Number of shares held by executives as a percentage of total shares
Growth	Enterprise growth	Growth rate of business revenues of enterprises
Ind	Proportion of independent directors	Percentage of independent directors on the board of directors
SOE	Nature of property rights	1 for state-owned enterprises, 0 for non-state-owned enterprises
Market	The marketisation process	Selected marketisation indices from the China Sub-Provincial Marketisation Index Report (2018) compiled by Xiaolu Wang et al.
Year	year (e.g. school year, fiscal year)	Annual dummy variables
Ind	sector	Industry dummy variables (first two codes for manufacturing, first code for other industries)

## 5. Empirical Analysis

### 5.1. Descriptive Statistics

Table 3 reports the descriptive statistics for the variables of interest. The mean value of CEOarmy is 0.0323, indicating that about 3 per cent of CEOs have military experience.

**Table 3.** Descriptive statistics

variant	observed value	average value	(statistics) standard deviation	minimum value	median	maximum values
DCG	19104	1.1192	1.354	0.00	0.69	4.84
CEOarmy	19104	0.0332	0.179	0.00	0.00	1.00
Lev	19104	0.4154	0.202	0.05	0.41	0.86
Board	19104	2.2416	0.178	1.79	2.30	2.77
Ind	19104	0.3756	0.054	0.33	0.36	0.57
Top1	19104	0.3391	0.147	0.09	0.32	0.74
Size	19104	22.1025	1.215	19.99	21.94	26.00
Mag	19104	0.0816	0.145	0.00	0.00	0.62
Growth	19104	0.1759	0.386	-0.51	0.11	2.34

## 5.2. Correlation Analysis

Table 4 shows the correlation coefficient analysis of the main variables. From Table 4, the correlation coefficients between all the main variables are less than 0.6, indicating that there is no multicollinearity in the model.

**Table 4.** Correlation analysis

	DCG	CEOarmy	Lev	Board	Ind	Top1	Size	Mag	Growth	Market
DCG	1									
CEOarmy	0.050***	1								
Lev	-0.085***	-0.0110	1							
Board	-0.096***	-0.022***	0.154***	1						
Ind	0.063***	0.016**	-0.00700	-0.540***	1					
Top1	-0.141***	-0.016**	0.060***	0.00500	0.055***	1				
Size	0.017**	-0.026***	0.529***	0.252***	0.00500	0.163***	1			
Mag	0.117***	0.054***	-0.254***	-0.161***	0.104***	-0.032***	-0.286***	1		
Growth	0.029***	0.00700	0.031***	-0.00800	-0.00800	0.0110	0.035***	0.055***	1	
Market	0.278***	0.00900	-0.074***	-0.152***	0.066***	-0.034***	0.00700	0.164***	-0.013*	1

## 5.3. Regression Analysis

**Table 5.** CEO military experience and enterprise digital transformation

	(1) DCG
CEOarmy	0.145*** (2.93)
Lev	-0.277*** (-5.70)
Board	-0.079 (-1.41)
Ind	0.554*** (3.12)
Top1	-0.440*** (-8.30)
Size	0.111*** (12.94)
Mag	0.546*** (8.99)
Growth	0.106*** (4.99)
Constant	-2.075*** (-8.91)
Year & Ind	containment
N	19104
R <sup>2</sup>	0.373

Note: t-values in parentheses; \*\*\*, \*\*, \* indicate significant at the 1 per cent, 5 per cent and 10 per cent levels, respectively.

Column (1) in Table 5 shows the regression results of model (1), where the dependent variable is the firm's digital transformation (DCG) and the independent variable is the CEO's experience

from the military (CEOarmy). In Column (1), the regression coefficient of CEOarmy is significantly positive at the 1% level, indicating that the GM's experience in the military contributes to the firm's digital transformation, proving H1.

In this paper, the samples are grouped according to the nature of ownership of the firms and then regressed on model (1) separately and the results are shown in columns (1) and (2) of Table 6. Column (1) is for state-owned firms, and the coefficient of the independent variable CEOarmy is positive but insignificant, while column (2) is for non-state-owned firms, and the coefficient of the independent variable CEOarmy is significantly positive at the 1% level, suggesting that the impact of military experience of CEOs of non-state-owned firms on the digital transformation of the firms is more significant compared to that of state-owned firms, proving H2.

**Table 6.** Nature of property rights

	(1) State-owned enterprises	(2) Non-State-owned Enterprises
CEOarmy	0.095	0.155***
	(1.05)	(2.72)
Lev	-0.328***	-0.235***
	(-4.11)	(-3.76)
Board	-0.078	0.118
	(-0.98)	(1.50)
Ind	0.380	1.069***
	(1.40)	(4.52)
Top1	-0.291***	-0.294***
	(-3.32)	(-4.28)
Size	0.071***	0.174***
	(5.55)	(14.58)
Mag	2.726***	0.446***
	(3.20)	(7.02)
Growth	0.080**	0.079***
	(2.39)	(3.05)
Constant	-1.130***	-4.145***
	(-3.68)	(-11.61)
Year & Ind	containment	containment
N	5796	13308
R <sup>2</sup>	0.348	0.371

To validate H3, this paper regresses model (2) and the results are shown in column (1) of Table 7. In Column (1), the regression coefficient of the cross-multiplier term of CEOarmy×Market is significantly positive at the 5% level, indicating that the marketisation process enhances the positive impact of CEO military experience on firms' digital transformation, proving H3.

**Table 7.** Marketisation process

	(1)
	DCG
CEOarmy	-0.259
	(-1.43)
Market	0.067***
	(15.17)
CEOarmy×Market	0.048**
	(2.16)
Lev	-0.244***
	(-5.06)
Board	-0.032
	(-0.58)
Ind	0.587***
	(3.34)
Top1	-0.465***
	(-8.79)
Size	0.108***
	(12.69)
Mag	0.438***
	(7.17)
Growth	0.105***
	(5.01)
Constant	-2.609***
	(-11.13)
Year & Ind	containment
N	19104
R <sup>2</sup>	0.380

## 6. Robustness Tests

### 6.1. Independent Variables Lagged by One Period

Considering the possible bias in the results due to endogeneity issues in the model design, this paper lags the independent variables by one period. The regression results for column (1) CEO experience in the military (CEOarmy) are significantly positive, consistent with the results above. Column (2) The regression results for CEO experience in the military (CEOarmy) are insignificant, and Column (3) The regression results for CEO experience in the military (CEOarmy) are significantly positive, consistent with the results above. The regression results for Column (4) CEOarmy×Market are insignificant, but the sign is positive consistent with the above results. In summary, this is generally consistent with the main findings of this paper.

**Table 8.** Robustness tests

	(1) Lord's return	(2) state-owned business	(3) non-state enterprise	(4) High marketisation process
CEOarmy	0.132**	0.144	0.128*	-0.139
	(2.26)	(1.33)	(1.91)	(-0.61)
Market				0.072***
				(14.30)
CEOarmy×Market				0.032
				(1.17)
Lev	-0.248***	-0.288***	-0.202***	-0.218***
	(-4.27)	(-3.00)	(-2.73)	(-3.79)
Board	-0.090	-0.114	0.141	-0.036
	(-1.40)	(-1.26)	(1.54)	(-0.57)
Ind	0.599***	0.347	1.187***	0.640***
	(2.95)	(1.12)	(4.34)	(3.18)
Top1	-0.488***	-0.309***	-0.337***	-0.514***
	(-7.80)	(-3.00)	(-4.14)	(-8.25)
Size	0.102***	0.066***	0.159***	0.099***
	(10.14)	(4.25)	(11.54)	(9.95)
Mag	0.758***	2.937***	0.631***	0.633***
	(10.23)	(2.82)	(8.14)	(8.50)
Growth	0.121***	0.084*	0.096***	0.121***
	(4.70)	(1.92)	(3.11)	(4.81)
Constant	-1.831***	-0.869**	-3.869***	-2.437***
	(-6.69)	(-2.38)	(-9.22)	(-8.87)
Year & Ind	containment	containment	containment	containment
N	14612	4491	10121	14612
R <sup>2</sup>	0.375	0.342	0.374	0.383

## 6.2. Propensity Score Matching

Considering the endogeneity problem caused by self-selection bias in the paper, this paper further mitigates this problem through the propensity score matching (PSM) method. The impact of the CEO's military experience on the firm is tested by screening out firms that are similar to the firms of CEOs with military experience, but the CEOs do not have military experience. The specific steps of the propensity score matching method (PSM) are as follows: firstly, a logit model is used to do propensity scoring on whether the sample company has a chairman with military experience; then the variables of board size (Board), proportion of sole directors (Ind), proportion of shares held by the first largest shareholder (Top1), size of the company (Size), and proportion of shares held by the executives (Mag) are used as covariates. DCG (digital transformation of enterprises) is also used as the dependent variable, and the sample is matched using one-to-three nearest-neighbour matching method.

**Table 9.** Common support assumptions

	unsupported	support sth.	aggregate
control group	462	17,930	18,392
disposal group	0	635	635
aggregate	462	18,565	19,027

According to Table 9, the total number of matching samples is 19,027, of which there are a total of 18,392 observations in the control group and 635 observations in the treatment group, and a total of 18,565 observations satisfy the common support hypothesis, which indicates that the quality of the matching is good.

**Table 10.** Change in bias for control and disposal groups after nearest neighbour matching treatment

variable name	Before and after matching	average value		misalignment	Decrease in absolute value of deviation	T-test	
		disposal group	control group			T-value	P-value
Board	pre-match	2	2.2425	-11.4		-3	0.003
	after matching	2	2.2195	0.8	93.1	0.14	0.887
Ind	prematch	0.38019	0.37537	9		2.23	0.026
	after matching	0.38019	0.37974	0.8	90.6	0.15	0.881
Top1	prematch	0.32621	0.33952	-9.5		-2.24	0.025
	after matching	0.32621	0.31893	5.2	45.3	0.96	0.337
Size	prematch	21.935	22.109	-14.5		-3.56	0
	after matching	21.935	21.888	3.8	73.5	0.72	0.474
Mag	prematch	0.12352	0.08016	27.5		7.43	0
	after matching	0.12352	0.12729	-2.4	91.3	-0.39	0.696

**Table 11.** Propensity score matching results ATT

implicit variable	Matching method	process group	control group	discrepancy	standard error	T-value
DCG	nearest neighbor matching	1.48441325	1.35307943	0.131333826	0.072385919	1.81*

According to Table 11, the difference value of propensity score matching when the dependent variable is DCG is 0.148 and significant at the 10% level. After matching by propensity score, this paper finds that CEOs' military experience still has a significant impact on corporate digital transformation, which is largely consistent with the main findings of this paper.

### 6.3. Instrumental Variables Approach

In order to test the robustness of this paper's findings, the paper further considers whether there are some implicit factors (e.g., CEO's personality traits and family factors) that jointly influence the CEO's tendency to join the military and his or her behaviour in corporate governance, resulting in a spurious correlation between the two. To address this endogeneity problem, this paper refers to the method of Quan Xiaofeng et al. (2019) and applies the two-stage instrumental variable method to control for it. The instrumental variable is chosen to be the Area variable of the regional military climate. The regional military climate is measured by the number of regional generals who were first awarded the rank of general marshal in 1955 after the founding of the new China, in which the weighted ratios of marshal, general, admiral, lieutenant general, and major general in the following order: 1:1:1:1:1. The higher the number of marshals in each region, the higher the "demonstration effect" and "celebrity effect" on the youth in the region, but not on the digital transformation of enterprises. Column (1) of Table 12 shows the results.

As can be seen from Table 12, the coefficient of Area from military atmosphere (Area) in regression (1) is positive and significant at 1% level of significance. After the introduction of the two-stage instrumental variable regression method, it is found that CEO military experience

still has a significant positive impact on enterprise digital transformation. In summary, the test results did not change significantly, confirming the robustness of the conclusions drawn in this paper.

**Table 12.** Impact of regional military climate on enterprise digital transformation

	(1) CG
Army	0.002***
	(3.85)
Lev	-0.267***
	(-5.47)
Board	-0.082
	(-1.45)
Ind	0.604***
	(3.38)
Top1	-0.456***
	(-8.52)
Size	0.111***
	(12.84)
Mag	0.617***
	(9.94)
Growth	0.110***
	(5.15)
Constant	-2.087***
	(-8.89)
Year	containment
Ind	containment
N	18638
R <sup>2</sup>	0.374

#### 6.4. Conclusion and Insights

Based on the hand-collected data on the military experience of CEOs of listed companies, this paper tries to examine the behavioural patterns of CEOs with military experience and their role in enterprise digital transformation from the perspective of army culture. The paper finds that CEOs who have experienced military life have a greater impact on corporate digital transformation and can significantly promote corporate digital transformation. Further, from both internal and external perspectives, it is found that compared with state-owned enterprises, the impact of CEOs with military experience on enterprise digital transformation is more significant in non-state-owned enterprises; the marketisation process enhances the positive impact of CEOs with military experience on enterprise digital transformation. The above conclusions are basically unchanged after a one-period lag of the independent variables, the robustness test of the propensity score matching method and the instrumental variable method, and the exclusion of the potential endogeneity test. The findings of this paper not only enrich the relevant literature on the factors influencing the digital transformation of enterprises, but also extend the research on the decision-making mechanism at the micro-firm level by highlighting the importance of the military culture on corporate decision-making from the perspective of the military culture.

The takeaways from this paper are (1) For companies, companies can consider accepting executives from different organisations, such as retired and transitioning military personnel. It promotes the enhancement of digital transformation of enterprises. (2) For the government,

encouraging and guiding outstanding military personnel to enter the enterprise after their career change will help improve the corporate governance structure and promote the good development of the company.

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