Hindawi

Research Article

The Impact of Senior Executives' Military Experience on Corporate GTFP

Peng Liu [1] **and Tongxu Wang**[2]

[1]*School of Business, Xi'an University of Finance and Economics, Xi'an 710100, China*
[2]*College of International Cooperation, Xi'an International University, Xi'an 710077, China*

Correspondence should be addressed to Peng Liu; liupg615412@mail.nwpu.edu.cn

The influencing factors of corporate GTFP are a topic of considerable interest in the academia, but they are mainly limited to discussing the impact of formal institutions on corporate GTFP. Although a small amount of literature has studied the impact of clan culture, Confucian culture, and social trust on corporate GTFP based on informal institutions, they have ignored the factor of senior executives' military experience. To fill this research gap, using a sample of Chinese A-share listed companies in Shanghai and Shenzhen from 2011 to 2021, this article studies the impact of senior executives' military experience on corporate green total factor productivity (GTFP). The results show that senior executives' military experience has a significant positive impact on corporate GTFP. Further research shows that the positive impact of senior executives' military experience on corporate GTFP is more significant in regions with imperfect formal institutions. The test of mechanism effect shows that R&D investment is an important channel for executives' military experience to promote corporate GTFP. For the first time, this article examines the impact of informal institutions on corporate GTFP from the perspective of senior executives' military experience. The research contributions of this study are as follows: it enriches the literature on the economic consequences of senior executives' military experience and the influencing factors of corporate GTFP and has enlightenment and reference significance for improving the corporate GTFP.

1. Introduction

President Xi definitely stressed that "high-quality development is the primary task of building a modern socialist country in an all-round way" in the twenty report. Achieving the goal of high-quality development depends on many measures, and one of which is the need to "focus on improving the green total factor productivity of enterprises."

The influencing factors of corporate GTFP is a topic of great concern in the academia. The existing literature mainly focuses on the micro and external macroenvironment factors of enterprises [1–3]. However, it is mainly limited to exploring the impact of formal institutions on the corporate GTFP. However, relevant studies have shown that the impact of informal institutions on economic activities cannot be ignored, especially in emerging countries where formal institutions are not perfect. For example, Chen et al. found that religion has a good role in promoting corporate governance [4]. Based on the sample study of Chinese listed companies, Guan et al. found that the alumni connection between the senior executives of the audited enterprises and the auditors would damage the audit quality and increase the audit fees [5]. Although a small amount of literature has studied the impact of clan culture, Confucian culture, and social trust on the corporate GTFP based on informal institutions [6–8], they ignore the factor of senior executives' military experience. Relevant research has shown that senior executives' military experience will have a decisive impact on their decision-making in the enterprise. To fill the research gap, this study attempts to analyze the impact of senior executives' military experience on the corporate GTFP.

Senior executives' military experience is expected to have a positive impact on corporate GTFP. On the one hand, the accumulated training during the military experience has made senior executives have a strong sense of innovation and aggressive spirit, which makes them tend to be more innovative in daily business activities, thus promoting the GTFP of enterprises. On the other hand, the military experience strengthens their collective consciousness and also shapes their noble qualities of being willing to sacrifice and contribute. These excellent qualities will encourage them to choose innovation investment activities that are more conducive to maximizing the overall value of enterprises, thus improving the GTFP of enterprises.

In order to verify the role of senior executives' military experience in improving corporate GTFP, this study uses the data of Chinese A-share listed companies from 2011 to 2021 to empirically test the impact of senior executives' military experience on corporate GTFP. The study finds that senior executives' military experience has a positive impact on the corporate GTFP. After a series of robustness tests and endogeneity methods are used to control, the above conclusions are still valid. Further research finds that the positive impact of senior executives' military experience on corporate GTFP is more significant in regions with imperfect formal institutions. The mechanism test shows that promoting R&D investment is an important channel for executives' military experience to improve the corporate GTFP.

The research contribution of this study is mainly reflected in the following three aspects. First, this study explores the impact of the informal institution of senior executives' military experience on corporate GTFP, which further enriches the literature on the influencing factors of corporate GTFP, especially for the influencing factors of informal institutions.

Second, this study also enriches the relevant research on the economic consequences of senior executives' military experience. In terms of the research on the economic consequences of senior executives' military experience, relevant scholars have studied the impact of senior executives' military experience on corporate earnings management, innovation, and internal control [9–11]. This study further enriches the research on the economic consequences of senior executives' military experience.

Finally, the empirical conclusions of this study have a certain practical value and policy implications. This study explores the impact of senior executives' military experience on corporate GTFP and its mechanism. The research conclusions show that the CEO's military experience has a positive effect on GTFP that enlightens enterprise to consider the military experience factor while recruiting senior managers.

The rest of the study is organized as follows: literature review is given in Section 2. Section 3 shows theoretical analysis and research hypothesis. In Section 4, the design of the empirical study is presented in detail. Empirical results are shown in Section 5. Finally, conclusions are drawn in Section 6.

2. Literature Review

2.1. Influencing Factors of Corporate GTFP. Corporate GTFP is affected by a series of factors. The existing literature mainly studies corporate GTFP from the external macro environment to corporate microlevel. Factors at the macro level involve legal protection, environmental regulation, upgrading of industrial structure, matching degree of financial structure-innovation level, and so on. For example, some studies have shown that the formal institution of legal protection has a significant positive impact on improving the level of GTFP of commercial banks [12]. The academic community has not reached a consensus on the relationship between environmental regulation and corporate GTFP, and there are mainly three views as follows: the first is the "compliance cost effect," which holds that environmental regulations will inevitably increase the cost of pollution abatement for enterprises, thus crowding out R&D funds and adversely affecting the GTFP of enterprises. This conclusion is confirmed by the research of Wu et al. who found that environmental regulation requirements are not good for GTFP in the short term [13]; this conclusion is also supported by the research of Gray and Shadbegian, which finds that command-and-control environmental regulation is not conducive to the growth of corporate GTFP, due to the increase in the cost of corporate pollution abatement [14]. The second is the "innovation compensation effect." It is believed that reasonable environmental regulation will force enterprises to invest in R&D, resulting in the "innovation compensation effect," which makes up for or even surpasses the "compliance cost effect," and achieves a win-win situation of environmental improvement and economic growth. Li and Bai found that the joint synergy of encouraging and restrictive environmental regulation effectively improved the level of corporate GTFP [15]; the research of Yang et al. shows that environmental regulatory requirements will induce enterprises to increase the R&D investment, thus promoting the growth of GTFP [16]. The third is the inflection point effect, which holds that the relationship between environmental regulation and GTFP is uncertain. The research of Wang and Shen shows that there is an inverted U-shaped relationship between environmental regulation and GTFP [17]. The Internet is conducive to technological progress due to its own advantages such as information sharing, information symmetry, platform innovation, and risk aversion. Thus, GTFP will be improved [18–20]. Both the Internet and the upgrading of industrial structure have a positive impact on the GTFP of enterprises [21]. Improving the matching degree between financial structure and innovation level can significantly improve the level of GTFP of enterprises [2]. In terms of the level of macroeconomic development, Klumpes analyzed the influencing mechanism of macroeconomic factors on the GTFP of commercial banks and believed that the higher the level of economic development will produce, the higher the level of GTFP of commercial banks will be [22–24].

Factors at the microlevel of enterprises mainly involve foreign direct investment (FDI), and scholars have different views on the impact of FDI on the corporate GTFP. Yao et al. found that FDI had an inhibitory effect on corporate GTFP in the long run [25]; Berger and Humphrey believed that FDI had a long-term promotion effect on the corporate GTFP [26, 27]. Zhang et al. found that with the deepening of the entry of foreign strategic investors, the GTFP of enterprises showed a U-shaped feature of declining first and then increasing [28].

In addition, a small amount of literature has explored the impact of informal institutions on corporate GTFP. For example, Zhungo and Yin found that clan culture significantly promoted the growth of GTFP of private enterprises [6]. Qi and Wang confirmed that Confucian culture can significantly improve the GTFP of enterprises [7]. Yang et al. found that social trust has a significantly positive impact on the corporate GTFP [8].

To sum up, although scholars have carried out quite sufficient research on the influencing factors of corporate GTFP, the existing literature still has defects and deficiencies in the following aspects.

First, the existing literature mainly discusses the impact of formal institutional level on corporate GTFP, ignoring the informal institutional level. Relevant studies have fully confirmed that factors at the level of informal institutions have an important impact on economic activities, which is more obvious in emerging countries with imperfect formal institutions.

Second, although a small amount of literature has discussed the impact of factors at the informal institutional level on corporate GTFP, it ignores senior executives' military experience. Relevant studies have confirmed that there are significant differences in the business decisions of senior executives with or without military experience, which is bound to have an impact on corporate GTFP. Based on this, this study explores the specific impact of senior executives' military experience on the corporate GTFP.

Third, most of the existing studies on corporate GTFP do not consider the lagged impact of influencing factors on corporate GTFP in empirical studies. Since the change of corporate GTFP takes a certain period, the impact of influencing factors on it should be lagged rather than immediate.

2.2. The Economic Consequences of Senior Executives' Military Experience. The military experience of corporate executives will have a crucial impact on many aspects of the enterprise. For example, Quan et al. found that senior executives' military experience has a positive effect on enterprises' earnings management [9]. Senior executives' military experience has a positive impact on the innovation level of enterprises [10]. Liao et al. found that senior executives' military experience can significantly improve the quality of internal control [11].

This shows senior executives' military experience will have a crucial impact on the economic consequences of enterprises. Considering the importance of corporate GTFP,

the existing research has not provided the microevidence of the influence of senior executives' military experience on the corporate GTFP. This study attempts to explore this aspect.

3. Theoretical Analysis and Research Hypothesis

3.1. Research on the Impact of Senior Executives' Military Experience on Corporate GTFP. This study argues that the impact of senior executives' military experience on corporate GTFP is mainly reflected in the following two aspects.

First is the connotation of innovation and enterprising spirit. One's military experience must be filled with a lot of military training, and the tasks that need to be completed in each military training are first of all unknown, full of challenges, and have not been tried before. If you want to complete the task well, you need to fully mobilize your awareness of innovation, and you will certainly face many difficulties in the execution of the task. After years of training, military experience has made the military personnel to have a strong sense of innovation. At the same time, military experience can brand the military personnel as overconfident and arrogant that will cause them to underestimate the risk of failure. Executives with these qualities are more inclined to engage in risky R&D and innovation activities in daily business operations, thus improving the GTFP of enterprises.

Second, reduction of enterprises agency cost and supervision cost. Another important quality that soldiers are imbued with in military training is to sacrifice personal interests, and dedication is higher than self-interest [29]. They have strong collective consciousness, put collective interests in the first place, and do not value the gains and losses of individual interests, emphasizing that individual interests should unconditionally obey the overall situation and collective interests [30]. We expect that this value will help encourage military executives to make decisions and actions based on the maximization of the overall value of the enterprise, so that they will be more loyal to the maximization of the enterprise value rather than the maximization of personal interests. It encourages them to actively carry out long-term R&D investment activities that are conducive to the maximization of corporate value, rather than short-term investment activities that are conducive to the maximization of their own interests, so as to enhance the GTFP of enterprises. Based on the above analysis, this study proposes the following hypothesis:

H1: Senior executives' military experience has a significantly positive impact on improving corporate GTFP.

3.2. Situational Study on the Impact of Senior Executives' Military Experience on Corporate GTFP. This part mainly discusses whether the influence of senior executives' military experience on corporate GTFP is affected by formal institutions, and what moderating role does formal institutions play in the relationship between the two.

Previous studies have confirmed that formal institutions such as legal protection and environmental regulation have

a significant impact on corporate GTFP. However, it is still controversial whether the formal system and the informal system of senior executives' military experience play a substitution effect or a complementary effect in the process of improving corporate GTFP. One view is that there is a substitution effect between formal and informal institutions [31]. It holds that institutional evolution is a process of gradual accumulation. If the overall market environment, as a formal system, does not provide sufficient protection to investors, it will be difficult for it to effectively protect and motivate the innovation capacity building of enterprises, and senior executives' military experience will play a role. Executives without military experience tend to be conservative in R&D investment activities, while those with military experience will still carry out R&D investment activities due to their unique qualities such as strong innovation consciousness, overconfidence, and arrogance, which lead to significant differences in GTFP of the two types of enterprises. In the context of relatively perfect formal institutions, due to the high degree of protection for investors' innovation achievements, different types of executives tend to invest in R&D activities, which lead to the reduction of the significant difference in the GTFP of two types of companies. Another view is that formal and informal institutions complement each other. In regions with more perfect formal institutions, formal institutions can provide predeterrence and postguarantee for the effect of informal institutions, further weaken the worries of senior executives with military experience in R&D investment activities, and further stimulate their potential in R&D investment activities. Based on the above analysis, this study puts forward the following competitive hypothesis:

H2a: The positive impact of senior executives' military experience on corporate GTFP is more significant in regions with imperfect formal institutions.

H2b: The positive impact of senior executives' military experience on corporate GTFP is more significant in regions with perfect formal institutions.

3.3. Research on the Transmission Mechanism of Senior Executives' Military Experience on Corporate GTFP. According to the above analysis, corporate executives with military experience have the characteristics of aggressiveness, strong sense of innovation, overconfidence, arrogance and strong collective consciousness, and tend to invest in R&D activities in specific business activities, thus improving the GTFP of enterprises. Based on the above analysis, this study proposes the following hypothesis:

H3: Promoting R&D investment is an important channel for executives' military experience to improve corporate GTFP.

4. Study Design

4.1. Variables and Models. Considering that senior executives' military experience affects GTFP through R&D investment, which is a long-term investment with a long period of time. Therefore, in this study, the explained variable in the regression model adopts $t + 1$ period and the explanatory variables and control variables on the right use t period to empirically test hypothesis 1. The model is as follows:

$$\text{GTFP}_{it+1} = \beta_0 + \beta_1 \text{Army}_{it} + \sum_m \beta_m \text{Control}_{m,it} + \gamma_i + \gamma_t + \varepsilon_{it}. \tag{1}$$

The explained variable corporate green total factor productivity (GTFP) in Model (1) is measured by the DEA model considering unexpected output. The input factors are human and capital, the expected output is sales revenue, and the unexpected output is the output of three wastes (waste water, waste gas, and waste). The main explanatory variable Army is the senior executive's military experience. If the CEO has military experience, the value is 1; otherwise, it is 0. Referring to the relevant literature, some control variables are selected. It includes the enterprise size (Size) measured by the natural logarithm of the company's total assets, the asset-liability ratio (Lev) measured by the company's total liabilities/total assets, the profitability (Roa) measured by the

net profit/total assets, and the listing age (Age) measured by the company's listed years. The property right nature (State) is expressed as 1 if the actual controller is state-owned; otherwise, it is 0. The size of the board (Board) is measured by ln (1 + the number of directors). Executive power (Dual) is expressed as 1 if the chairman and the general manager are the same person, and otherwise it is 0. In addition, this study also controls the year fixed effect and individual fixed effect.

To test hypothesis 2, we add formal institution and the interaction term between formal institution and senior executives' military experience to model (1), and the test model is as follows:

$$\text{GTFP}_{it+1} = \beta_0 + \beta_1 \text{Army}_{it} + \beta_2 \text{Market}_{it} + \beta_3 \text{Army}_{it} * \text{Market}_{it} + \sum_m \beta_m \text{Control}_{m,it} + \gamma_i + \gamma_t + \varepsilon_{it}. \tag{2}$$

The Market representing formal system in the model is measured by the marketization index in China's Marketization Index by Province 2018 compiled by Wang et al., which can represent the overall situation of institutional construction of the whole market development, legal system, factors, and product market development [32]. The total score of a marketization index is used to measure the marketization process, the higher the score is, the higher the degree of marketization is, and the more perfect the corresponding formal system is.

To test hypothesis 3, the mediating effect model is set according to the method of Baron and Kenny as follows [33]:

$$
\begin{aligned}
\mathrm{RD}_{it} &= \alpha_0 + \alpha_1 \mathrm{Army}_{it} + \sum_m \alpha_m \mathrm{Control}_{m,it} + \gamma_i + \gamma_t + \varepsilon_{it}, \\
\mathrm{GTFP}_{it+1} &= \delta_0 + \delta_1 \mathrm{Army}_{it} + \delta_2 \mathrm{RD}_{it} + \sum_m \delta_m \mathrm{Control}_{m,it} + \gamma_i + \gamma_t + \varepsilon_{it}.
\end{aligned}
\tag{3}
$$

The explained variable RD in model (3) represents the R&D investment of enterprises, which is measured by the proportion of R&D expenditure in operating income. The definitions and measurement methods of the above variables are shown in Table 1.

4.2. Sample Selection and Descriptive Statistics.
In the selection of sample data, the A-share listed companies in mainland China from 2011 to 2021 are selected as the research samples. The relevant financial data required in this study mainly come from the CSMAR and Wind database. The data of the company's senior executives' military experience were manually collected and sorted out through annual reports, search engines, the company's official website, Sina Finance, and media reports. Referring to the existing literature, we processed the initial data as follows: exclusion of financial companies, ST companies, and companies without relevant financial data and CEO background information. After screening, 11,935 company-year observations are finally obtained. In order to eliminate the influence of extreme values on the research conclusions, this study winsorizes all continuous variables at the level of 1%.

Table 2 reports the descriptive statistics of the main variables. It can be seen that the GTFP varies greatly among different firms. The mean value of the explanatory variable of senior executives' military experience is 0.053, indicating that the proportion of sample enterprises with senior executives' military experience is relatively low. The mean value of the moderating variable marketization index (Market) is 8.393, the maximum value is 9.970, and the standard deviation is 1.487, indicating that the formal institutional environment in different regions of China varies greatly; the mean value of the mediating variable R&D investment (RD) is 0.046, the maximum value is 0.078, and the standard deviation is 0.620, indicating that there is a large difference in R&D investment among sample enterprises. Among the control variables, the size, debt paying capacity, and profitability of different enterprises are not consistent, and the mean value of property rights in the overall sample is 0.307, indicating that most of the enterprises in the sample are private enterprises.

5. Empirical Result

5.1. Basic Empirical Results.
Table 3 reports the regression results of hypothesis 1. The regression results show that the regression coefficient of Army is significantly positive at the level of 1% (0.028, $t = 0.008$), indicating that compared with enterprises without senior executives' military experience, enterprises with senior executives' military experience have higher GTFP. This result supports hypothesis 1 that senior executives' military experience has a positive impact on the corporate GTFP.

5.2. Robustness Test.
In order to ensure the reliability of the benchmark regression results in this paper, this study conducts robustness tests from the following aspects.

5.2.1. Replacement of Explained Variable.
Furthermore, considering the robustness of the relationship between senior executives' military experience and corporate GTFP, this study adopts the variable substitution method to replace the explained variables and adopts the nonradial and nonangle SBM model with nonexpected output to further measure and replace corporate GTFP.

After replacing the explained variables, the regression results of hypothesis 1 are shown in Table 4. The coefficient of senior executives' military experience is significantly positive, so hypothesis 1 is verified again, and the previous research results are robust.

5.2.2. Endogenous Problem.
The mean and median tests of the treatment group (the sample group with senior executives' military experience) and the control group (the sample group without military experience) indicate that there is a large difference between the control variables of the two groups of samples. If there are missing variables that affect both corporate GTFP and whether a company has executives with military experience, this situation will lead to an endogeneity problem of self-selection. To solve this endogeneity problem, we performed propensity score matching between the control and treatment groups to ensure comparability between the two groups. Specifically, we first use army variable as the dependent variable, and all control

TABLE 1: Variable selection and definition.

Variable types	Variable name	Variable symbol	Variable definition
Explained variable	Green total factor productivity	GTFP	The DEA model of undesired output is used for calculation
Explaining variable	Senior executive military experience	Army	An executive with military experience is assigned a value of 1, otherwise 0
Moderator	Marketization Index	Market	From China's Marketization Index Report by Province (2018)
Mediator	Corporate R&D investment	RD	RD expenditure/Operation revenue
Controls	Company scale	Size	Natural logarithm of the firm's total assets
	Asset-liability ratio	Lev	Gross liability/total assets
	Profitability	Roa	Net profit/total assets
	Listing age	Age	The number of years the company has been listed
	Nature of property right	State	If the actual controller is state-owned, the value is 1; otherwise, the value is 0
	Board size	Board	ln(1 + number of directors)
	Executive power	Dual	Value is 1 if the chairman and the general manager are the same person; otherwise, the value is 0
	Year dummy variable	Year	Year dummy variable
	Industry dummy variable	Industry	Industry dummy variable

TABLE 2: Descriptive statistics.

Variable	Mean value	Standard deviation	Median	Min	Max	N
GTFP	0.610	0.816	0.580	0.250	1.000	11935
Army	0.053	0.227	0.000	0.000	1.000	11935
Market	8.393	1.487	9.140	4.100	9.970	11935
RD	0.046	0.620	0.053	0.010	0.078	11935
Size	21.918	1.095	21.775	19.907	25.112	11935
Lev	0.399	0.189	0.386	0.056	0.821	11935
Roa	0.041	0.060	0.043	−0.253	0.181	11935
Age	8.469	6.488	7.000	1.001	25.000	11935
State	0.307	0.461	0.000	0.000	1.000	11935
Board	2.235	0.177	2.303	1.793	2.775	11935
Dual	0.703	0.456	1.000	0.000	1.000	11935

TABLE 3: Benchmark regression results.

Dependent variable: GTFP	
Army	0.028***
	(0.008)
Size	0.428***
	(0.013)
Lev	0.967***
	(0.064)
Roa	2.068***
	(0.185)
Age	0.002
	(0.002)
State	0.047***
	(0.024)
Board	−0.158***
	(0.052)
Dual	0.038**
	(0.019)
Year effect	Yes
Industry effect	Yes
Adj-R^2	0.226
N	11935

Note. *, **, and ***indicate significance at the levels of 10%, 5%, and 1% respectively, the same below.

TABLE 4: Replacement of explained variable.

Variables	GTFP
Army	0.032***
	(0.007)
Variables	GTFP
Controls	Yes
Year effect	Yes
Industry effect	Yes
Adj-R^2	0.210
N	11935

Note. Due to space limitations, the results of control variables are not reported, which are available upon request, the same below.

TABLE 5: Propensity score matching (PSM) regression results.

Variables	GTFP
Army	0.124***
	(0.018)
Controls	Yes
Year effect	Yes
Industry effect	Yes
Adj-R^2	0.236
N	1276

TABLE 6: Moderating effect of formal institutions.

Dependent variable: GTFP	
Army	0.054***
	(0.010)
Market	0.040***
	(0.008)
Army ∗ Market	−0.021**
	(0.009)
Controls	Yes
Year effect	Yes
Industry effect	Yes
Adj-R^2	0.238
N	11935

variables in model (1) as explanatory variables to conduct logit regression and calculate the propensity score value. Secondly, one-to-one matching is conducted between the treatment group and the control group according to the propensity score value, and the samples without matching are deleted. Finally, the matched samples are put into model (1) for regression again. The results are shown in Table 5, and the regression results are consistent with the previous ones, further supporting the main hypothesis of this study.

5.3. Analysis of Heterogeneity. The regression results of hypothesis 2 are reported in Table 6. The coefficient of the interaction term between military experience and formal institutions is significantly negative (−0.021, 0.009), indicating that formal institutions play a negative role in regulating the relationship between military experience and corporate GTFP, which supports hypothesis 2a.

5.4. Action Mechanism Test. Table 7 reports the regression results of hypothesis 3. As can be seen from the regression results in the first column, military experience has a significantly positive impact on the corporate R&D investment

Table 7: Mechanism effect test.

	RD	GTFP
Army	0.009*** (0.002)	0.011*** (0.002)
RD		0.498*** (0.036)
Controls	Yes	Yes
Year effect	Yes	Yes
Industry effect	Yes	Yes
Adj-R^2	0.210	0.310
N	11935	11935

(0.009, 0.002). The results in the second column show that both military experience and R&D investment have a significantly positive impact on corporate GTFP, and the influence coefficient of military experience on corporate GTFP is lower than the benchmark regression result (0.011 < 0.028). Hypothesis 3 is supported.

6. Conclusions and Discussion

6.1. Research Conclusions. Using a sample of Chinese A-share listed companies in Shanghai and Shenzhen from 2011 to 2021, this study empirically examines the impact of senior executives' military experience on corporate GTFP. The results show that (1) senior executives' military experience has a positive impact on corporate GTFP; (2) this kind of influence is more obvious and significant in regions with imperfect formal institutions; (3) corporate R&D investment is the transmission path through which senior executives' military experience affects corporate GTFP.

6.2. Implications. This article studies the influencing factors of corporate GTFP from the perspective of informal institutions with senior executives' military experience as the starting point, which further expands the literature on the influencing factors of corporate GTFP and has certain policy implications. On the one hand, this study finds that senior executives' military experience can significantly improve corporate GTFP. This suggests that when recruiting managers, enterprises should not only consider hard indicators such as educational background and work experience but also consider soft indicators such as military experience, so as to build a management team that is brave and willing to innovate. On the other hand, the study finds that formal institutions also play an irreplaceable role in promoting GTFP. External institutional suppliers need to pay attention to formal institutions to better motivate the important role of institutional environment in driving enterprises to improve GTFP. By improving the market-oriented environment and providing corresponding formal institutional legitimacy support, especially strengthening the institutional construction of relevant intellectual property rights, we can provide direct formal institutional environment support for driving enterprises to better improve GTFP.

6.3. Limitations and Future Research. The research limitation of this study is that the data only come from China, and whether the research conclusion is applicable to other countries needs further verification. The influencing factors at the informal institutional level of corporate GTFP need to be further explored, and future research on this aspect can be conducted from the cultural perspective.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

References

[1] X. H. Cui and M. Y. Lin, "How does FDI affect the GTFP of firms?-empirical analysis based on Malmquist-Luenberger index and PSM-DID," *Economics and Management*, vol. 3, pp. 38–55, 2019.

[2] X. J. Xie, X. F. Wang, and M. Lei, "Financial structure-innovation level matching, resource allocation efficiency and GTFP," *Collection of Finance and Economics*, vol. 7, pp. 43–52, 2020.

[3] J. Li and M. Wu, "Dual environmental regulation, FDI and GTFP: a case study of three urban agglomerations in the Yangtze River Economic Belt," *East China Economic Management*, vol. 36, no. 1, pp. 31–41, 2022.

[4] D. H. Chen, X. L. Hu, S. K. Liang, and F. Xin, "Religious tradition and corporate governance," *Economic Research*, vol. 9, pp. 71–84, 2013.

[5] Y. Guan, L. N. Su, D. Wu, and Z. Yang, "Do school ties between auditors and client executives influence audit outcomes?" *Journal of Accounting and Economics*, vol. 61, no. 2-3, pp. 506–525, 2016.

[6] Y. M. Zhuguo and J. Yin, "Clan culture and total factor productivity growth of private enterprises: from the perspective of social capital," *Industrial Economics Review*, vol. 5, pp. 79–98, 2021.

[7] X. Qi and Q. Wang, "Research on the cultural path of promoting the high-quality development of trade: from the perspective of total factor productivity," *Macro Quality Research*, vol. 3, pp. 70–85, 2021.

[8] Z. Yang, L. H. Cheng, and J. Chen, "The incentive effect of informal institutions on innovation in the era of digital intelligence: based on the micro-test of artificial intelligence enterprises," *Journal of Shanghai University of International Business and Economics*, vol. 5, pp. 35–55, 2021.

[9] X. F. Quan, W. H. Cu, and X. M. Xu, "Senior executives' military experience and corporate earnings management: a new investigation of military-civil integration development strategy," *Finance and Trade Economics*, vol. 1, pp. 98–113, 2019.

[10] X. F. Quan, W. H. Cu, and H. Y. Yin, "Senior executives' military experience, management style and corporate innovation," *Nankai Business Review*, vol. 6, pp. 140–151, 2019.

[11] F. N. Liao, H. L. Han, and L. R. Chen, "Does senior executives' military experience improve the quality of internal control?: empirical evidence from China's listed companies," *Audit Research*, vol. 6, pp. 121–128, 2018.

[12] J. Q. Li and S. J. Li, "Legal protection, social trust and total factor productivity of commercial banks," *Research of Institutional Economics*, vol. 4, pp. 1–32, 2017.

[13] L. Wu, X. Y. Jia, and C. Wu, "Impact of heterogeneous environmental regulation on China's GTFP," *China Population, Resources and Environment*, vol. 30, no. 10, pp. 82–92, 2020.

[14] W. B. Gray and R. J. Shadbegian, "Plant vintage, technology, and environmental regulation, and environmental regulation," *Journal of Environmental Economics and Management*, vol. 46, no. 3, pp. 384–402, 2003.

[15] Z. Y. Li and X. J. Bai, "How can industrial policy promote the improvement of manufacturing GTFP?" *Research on Industrial Economics*, vol. 6, pp. 28–42, 2020.

[16] C. H. Yang, Y. H. Tseng, and C. P. Chen, "Environmental regulations, induced R& D, and productivity: evidence from Taiwan's manufacturing industries, and productivity: evidence from Taiwan's manufacturing industries," *Resource and Energy Economics*, vol. 34, no. 4, pp. 514–532, 2012.

[17] Y. Wang and N. Shen, "Environmental regulation and environmental productivity: the case of China: the case of China," *Renewable and Sustainable Energy Reviews*, vol. 62, no. 9, pp. 758–766, 2016.

[18] Y. Gu, "Development of hackerspaces and construction of innovation ecosystem in national high-tech zones," *Reform and Strategy*, vol. 4, pp. 66–69, 2015.

[19] I. S. Akçomak and B. ter Weel, "Social capital, innovation and growth: evidence from Europe," *European Economic Review*, vol. 53, no. 5, pp. 544–567, 2009.

[20] C. L. Yan, "Social capital, innovation and long-term economic growth," *Economic Research Journal*, vol. 11, pp. 48–60, 2021.

[21] B. Chen and W. L. Wang, "Internet, industrial structure upgrading and green total factor productivity," *Ecological Economy*, vol. 37, no. 12, pp. 43–53, 2021.

[22] P. J. M. Klumpes, "Performance benchmarking in financial services: evidence from the UK life insurance industry," *Journal of Business*, vol. 77, pp. 257–273, 2004.

[23] X. L. Yuan and B. S. Zhang, "Research on the influencing factors of total factor productivity of Chinese commercial banks: malmquist index analysis based on DEA model," *The Journal of Quantitative and Technical Economics*, vol. 4, pp. 93–104, 2009.

[24] B. Wang and N. Zhu, "Research on the total factor productivity growth of China's banking industry under the constraint of non-performing loans," *Economic Research Journal*, vol. 5, pp. 32–45, 2011.

[25] S. J. Yao, C. X. Jiang, and G. F. Feng, "Reform and efficiency of China's banking industry: 1995–2008," *Economic Research Journal*, vol. 8, pp. 4–14, 2011.

[26] A. N. Berger and D. B. Humphrey, "Efficiency of financial institutions: international survey and directions for future research," *European Journal of Operational Research*, vol. 98, no. 2, pp. 175–212, 1997.

[27] J. H. Zhang and P. Wang, "Bank risk, loan scale and legal protection level," *Economic Research Journal*, vol. 5, pp. 18–30, 2012.

[28] Y. Zhang, S. L. Yin, and T. H. Liu, "Do overseas strategic investors improve the operating efficiency of China's commercial banks?" *Economic Review*, vol. 2, pp. 139–149, 2014.

[29] A. J. Daboub, A. M. A. Rasheed, R. L. Priem, and D. Gray, "Top management team characteristics and corporate illegal activity," *Academy of Management Review*, vol. 20, no. 1, pp. 138–170, 1995.

[30] J. L. Soeters, "Value orientations in military academies: a thirteen country study," *Armed Forces and Society*, vol. 24, no. 1, pp. 7–32, 1997.

[31] I. Hasan, C. K. S. Hoi, Q. Wu, and H. Zhang, "Does social capital matter in corporate decisions?: evidence from corporate tax avoidance," *Journal of Accounting Research*, vol. 55, no. 3, pp. 629–668, 2017.

[32] X. L. Wang, G. Fan, and J. W. Yu, *China's Marketization Index Report by Province (2018)*, Social Sciences literature Press, Beijing, China, 2019.

[33] R. M. Baron and D. A. Kenny, "The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations," *Journal of Personality and Social Psychology*, vol. 51, no. 6, pp. 1173–1182, 1986.