

The Impact of Female Executives on the Digital Transformation of Enterprises: An Empirical Study Based on Listed Companies

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Abstract: This study employs leadership contingency theory and resource dependency theory, utilizing financial data from Shanghai and Shenzhen A-share listed companies between 2012 and 2021. Ultimately, data samples from 4,742 companies were selected to empirically examine the impact and moderating role of female executives on corporate digital transformation. Findings reveal that the proportion of female executives positively promotes corporate digital transformation. Further analysis indicates that female executives drive digital transformation by enhancing corporate innovation investment and risk control capabilities. Supported by the heterogeneity analysis, it shows that this effect is more pronounced in high-tech industries, non-state-owned enterprises, and companies in economically developed regions. This study provides a gender-perspective theoretical explanation for the drivers of digital transformation and offers practical insights for optimizing corporate executive teams.

Keywords: Female executives; Digital transformation; Concentration of shareholding

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1. Introduction

As the core managerial force within enterprises, the role and influence exerted by management have increasingly become factors of significant attention. Whether it be the personal character of managers, their relationship with staff, or their gender, these elements profoundly impact management's strategic decision-making concerning the enterprise, thereby influencing its overall development. In this new era, female executives within corporate management have emerged from a state of non-existence, gradually increasing their representation and assuming greater authority. The distinctive contributions female executives make to organizations have garnered widespread attention^[1]. Based on traditional feminine attributes such as steadiness, inclusivity, and meticulousness, the integration of women into the workplace not only leverages their unique qualities but also injects a singular dynamism into corporate development.

2. Governance characteristics of female executives

Female executives are able to influence digital transformation through the following pathways.

2.1. Innovation-driven

Traditional perceptions suggest female managers lack innovative thinking. With rapid societal advancement, innovation has become an imperative for contemporary enterprises, and managers prioritize innovative decision-making for organizational growth. Furthermore, the professional environment for female executives has evolved, with workplace inequalities mitigated to some extent, creating greater developmental opportunities. In this era of accelerated progress, female managers increasingly cultivate innovative thinking to distinguish themselves from predominant male leadership, thereby proposing more creative ideas and decisions during management processes ^[2].

2.2. Risk balancing

The “networked thinking” characteristic of female managers offers greater integration capabilities than the “linear thinking” of their male counterparts ^[3]. This enables comprehensive consideration of an enterprise’s strengths, weaknesses, opportunities, and threats, alongside potential outcomes. The inherent caution of female managers also compensates for the overconfidence inherent in traditional male management styles, mitigating the pitfalls of reckless advancement. Consequently, when proposing risk-bearing decisions, they demonstrate greater assurance and higher implementation feasibility ^[4]. This facilitates steady corporate operations alongside innovative development, fostering greater adaptability to diversified growth trajectories. The inclusion of female managers introduces fresh perspectives and diverse ideas to management teams, fostering diversified thinking patterns.

2.3. Resource effects

According to resource dependence theory, female managers also play a unique role in promoting resource efficiency. Compared to their male counterparts, their inherent prudence not only curbs excessive investment and ensures rational planning and control of existing resources, but also enables higher resource utilization rates during transformative development ^[5]. Furthermore, it enhances corporate reputation. The steady management style of female executives attracts more collaborative partnerships with other enterprises, facilitating the acquisition of advantageous external resources ^[6].

3. Research design

3.1. Data sources

The data for this study were sourced from the GuoTaiAn Data Service Centre Database, selecting financial data from Shanghai and Shenzhen A-share listed companies between 2012 and 2021. The data underwent the following processing: (1) Financial sector listed companies were first excluded from the sample. (2) Companies with poor performance and consecutive losses, such as ST and PT listed companies, were excluded. (3) Companies listed on the STAR Market and the National Equities Exchange and Quotations (NEEQ) were excluded. (4) Firms lacking key data required for the study were excluded, thereby enabling an examination of the relationship between female executives and corporate digital transformation.

3.2. Model specification

To test the potential impact of female executive participation on corporate digital transformation, the following

model was constructed:

$$DT_{i,t} = \beta_0 + \beta_1 \ln X_{i,t} + \beta_2 \text{Controls}_{i,t} + \varepsilon_{i,t}$$

In the equation, i denotes the firm; t denotes time; β_0 denotes the constant term; β_1 and β_2 denote coefficients; Controls denotes the set of control variables; ε denotes the random disturbance term. The key focus in this model is the coefficient β_1 . If β_1 is significantly positive, it indicates that the participation of female executives promotes the firm's digital transformation.

3.3. Variable selection

The research variables in this paper are defined as follows:

- (1) Dependent variable: Digital transformation. The natural logarithm of the keyword frequency for digital transformation in listed companies' annual reports is taken to measure the degree of corporate digital transformation.
- (2) Independent variable: Proportion of female managers. Data on executive characteristics extracted from the GuoTaiAn database were processed for this study. The proportion of female executives is defined as the ratio of female executives to the total number of executives in the management team.
- (3) Control variables

3.4. Descriptive statistics

Descriptive statistics for key variables are presented in **Table 1**. As shown, the standard deviation of digital transformation level (dt) is 1.401, with a minimum value of 0 and a maximum of 6.301, indicating significant variation in firms' digital transformation levels. The mean proportion of female managers (x) is 0.18, suggesting a low representation of female executives in the sample firms.

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Digital transformation	31848	1.414	1.401	0	6.301
Percentage of female executives	30182	0.18	0.171	0	1
Company size	31854	22.158	1.345	14.942	28.636
Capital structure	31854	0.426	0.442	0.008	63.971
Profitability	31854	0.032	0.126	-16.112	0.969
Two jobs in one	31854	0.3	0.458	0	1
Shareholding concentration	31854	34.041	14.973	0	89.991
Ownership of the enterprise	31854	0.319	0.466	0	1
Company age	31854	2.015	0.967	0	3.466

The minimum company size was 14.942, with a maximum of 28.636, indicating significant variation in the selected firms' scale. The average size of 22.158 suggests that, overall, the companies were relatively large in scale. The minimum equity concentration was 0, while the maximum reached 89.991, reflecting considerable disparity in equity concentration among the sample enterprises.

4. The impact of female executives on the digital transformation

Firstly, based on the aforementioned model, the relationship between female executives and corporate digital transformation was examined. The regression results are presented in **Table 2**.

Table 2. Benchmark regression results

Digital transformation	Coef.	St. Err.	t-value	P-value	95% Conf	Interval	Sig
Percentage of female executives	0.436	0.046	9.53	0	0.346	0.526	***
Company size	0.118	0.007	16.50	0	0.104	0.132	***
Capital structure	-0.135	0.028	-4.74	0	-0.19	-0.079	***
Profitability	-0.35	0.098	-3.57	0	-0.543	-0.158	***
Two jobs in one	0.152	0.018	8.54	0	0.117	0.186	***
Shareholding concentration	-0.009	0.001	-15.36	0	-0.01	-0.007	***
Ownership of the enterprise	-0.229	0.02	-11.54	0	-0.268	-0.19	***
Company age	-0.059	0.01	-6.08	0	-0.078	-0.04	***
Constant	-0.75	0.148	-5.08	0	-1.04	-0.46	***
Mean dependent var		1.432		SD dependent var		1.406	
R-squared		0.028		Number of obs		30175	
F-test		109.410		Prob > F		0.000	
Akaike crit. (AIC)		102942.910		Bayesian crit. (BIC)		103017.743	

*** $P < 0.01$, ** $P < 0.05$, * $P < 0.1$

The results indicate that the regression coefficient between the proportion of female executives (x) and digital transformation (dt) is 0.436, significant at the 1% level. This demonstrates that the proportion of female executives can drive corporate digital transformation. Each additional unit of female executives increases digital transformation by 0.436 percentage points. Thus, Hypothesis 1 holds: the proportion of female executives exerts a positive influence on corporate digital transformation.

As demonstrated above, a significant positive correlation exists between female executive representation and corporate digital transformation. To examine this influence, equity concentration is introduced as a moderating variable to further analyze the role of female executives in digital transformation (**Table 3**).

Table 3. Results of moderating effects

Digital transformation	Coef.	St. Err.	t-value	P-value	95% Conf	Interval	Sig
Percentage of female executives	1.329	0.089	15.00	0	1.155	1.503	***
Inter	-0.027	0.002	-11.85	0	-0.031	-0.022	***
Company size	0.127	0.008	16.42	0	0.112	0.142	***
Capital structure	-0.418	0.047	-8.81	0	-0.511	-0.325	***
Profitability	-0.276	0.124	-2.23	0.026	-0.519	-0.033	**
Two jobs in one	0.153	0.018	8.62	0	0.118	0.188	***
Ownership of the enterprise	-0.258	0.02	-13.17	0	-0.297	-0.22	***
Company age	-0.032	0.01	-3.26	0.001	-0.05	-0.013	***
Constant	-1.184	0.159	-7.42	0	-1.496	-0.871	***

Table 3 (Continued)

Mean dependent var	1.432	SD dependent var	1.406
R-squared	0.027	Number of obs	30175
F-test	104.030	Prob > F	0.000
Akaike crit. (AIC)	102984.788	Bayesian crit. (BIC)	103059.621

*** $P < 0.01$, ** $P < 0.05$, * $P < 0.1$

This paper further examines the moderating effect of equity concentration, testing Research Hypothesis 2 by incorporating equity concentration as a moderator variable, with *inter* representing the interaction term between equity concentration and the proportion of female managers. The regression results are presented in **Table 3**. The analysis reveals that, when the moderator interaction term *inter* is added to the baseline model, its coefficient is -0.027 and significant at the 1% level. This indicates that higher equity concentration is associated with a lower likelihood of achieving digital transformation, suggesting that equity concentration exerts a negative moderating effect between the proportion of female executives and corporate digital transformation. Hypothesis 2 is thus supported.

5. Suggestions

In recent years, an increasing number of women have been leveraging their strengths in business management, with the proportion of female executives gradually rising. They are playing an increasingly critical role in corporate development processes and strategic decision-making. Within the context of the digital economy, enterprises are not only encountering new opportunities brought about by technological advancement and industrial upgrading, but emerging industries are also providing female managers, who have historically received limited attention, with a platform for development ^[7]. This study empirically examines the potential influence of female executives on firms' digital transformation and the mechanisms through which this influence operates. The results are as follows:

In light of the demands posed by the digital economy and the persistence of the “glass ceiling” problem widely experienced by women in the workplace, this paper proposes the following practical recommendations:

Firstly, society should devote greater attention to women. In traditional narratives and prior academic literature, women have rarely occupied a central position. Earlier research has often portrayed female managers as embodying traits such as weakness or indecisiveness, thereby objectifying them by attributing socially constructed gendered characteristics while neglecting the managerial competencies they possess and the broader possibilities that emerge once women are empowered.

Second, the government and society should provide support in reducing barriers to women's professional development. Within the framework of China's “talent-driven development strategy”, female talent constitutes a vital component of human capital for advancing the high-quality growth of the digital economy. Yet, many practical challenges remain unresolved, requiring policy-level interventions. Protecting women's legitimate workplace rights from the perspective of female professionals is essential to enabling them to leverage their advantages, thereby creating favorable conditions for female executives to play an active role in driving digital transformation.

Third, enterprises should place greater emphasis on the contributions of women in organizational

management. The inclusion of female executives brings multiple benefits to management teams, as diverse leadership styles are conducive to steady operations and long-term development. Firms must strive to dismantle the “glass ceiling” in the workplace, promote gender diversity at the managerial level, and increase the proportion of female executives. However, a mere numerical increase is insufficient. Only when female executives are granted substantive decision-making power—rather than serving symbolic roles aimed at demonstrating fairness—can they fully realize their managerial potential. This is particularly crucial in areas such as digital transformation, which entail strategic risks. Female executives can help firms achieve their objectives by ensuring decision-making optimization, gaining competitive advantages in emerging markets, strengthening risk management, enhancing firms’ risk-bearing capacity, increasing innovation investment, and improving research and development, as well as scientific innovation capabilities ^[8].

Disclosure statement

The author declares no conflict of interest.

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