Study on the influence mechanism of digital transformation and absorptive capacity on textile enterprise performance

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Abstract. Since the "14th Five-Year Plan", the development of China's textile industry has achieved good results, but there are also problems such as the degree of digital transformation is low, and there are few available digital resources. Therefore, this paper adopts text analysis method to construct enterprise digital transformation index from 2018 to 2022, and conducts regression analysis to empirically test how the digital transformation of textile enterprises affects their enterprise performance. The main conclusions are as follows: the digital transformation of textile enterprises can significantly promote the performance of textile enterprises., and absorptive capacity plays a partial intermediary role between enterprise digital transformation and enterprise performance.

Keywords: digital transformation; absorption capacity; textile enterprises

1 Introduction

The newly revised "Industrial Structure Adjustment Guidance Catalog" proposes to continue to promote the intelligent, green, and service-oriented transformation of manufacturing. but there are still some key technological shortfalls in the industry to be broken through, the degree of digital transformation is low, and there are few available digital resources. Therefore, the textile segments accelerate the digital and intelligent construction, optimize production processes, and use digital to solve business problems caused by resource constraints, and the digital transformation of the textile industry is of great significance to its own development and product sustainability.

2 Research hypothesis

2.1 Research hypothesis on digital transformation and enterprise performance

Li et al. (2021)[1] believed that enterprises focusing on digital transformation are more likely to effectively establish digital technology infrastructure, and make decisions that

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are beneficial to the enterprise, so as to improve corporate performance. Vial (2019)[2] believed that digital transformation will trigger strategic responses of enterprises, so that organizations can change the path of value creation to further improve corporate performance. Haihua Wang (2022)[3] through the application of meta-analysis method, believes that the four dimensions of digital transformation, including digital technology, have a strong positive correlation with enterprise performance.

Hypothesis H1: Digital transformation has a positive impact on enterprise performance.

2.2 Research hypothesis on absorptive capability and enterprise performance

Teece (2007)[4] believed that dynamic eventually evolved into the ability to gain a sustained competitive advantage. Yan Li (2022)[5] believes that the strength of absorptive capacity will directly affect the value created by time-honored enterprises in obtaining valuable resources and information by using social network capital.

Hypothesis H2: Absorptive capacity has a positive impact on firm performance.

2.3 Research hypothesis on digital transformation, absorptive capability and enterprise performance

Pengcheng Qiao et al. (2023)[6] believed that absorption capability is positively affected by enterprises' digital transformation, and plays a significant mediating role between enterprises' digital transformation and innovation performance. Hanhui Chen (2023)[7] believed that digital transformation has a stronger effect on the improvement of total factor productivity and digital transformation further improves the absorption capacity of enterprises, thus promoting the improvement of total factor productivity of enterprises. Jing Xiao (2023)[8] studied the dual performance of finance and environment and found that absorptive capacity only played an intermediary role in the relationship between digital transformation and corporate financial performance.

Hypothesis H3: Absorptive capacity plays a mediating role between digital transformation and enterprise performance.

3 Research design

This paper draws on the practices of scholar He Fan (2019)[9] and Scholar Yu Mengxin et al. (2022)[10] to measure digital transformation and absorption capacity and the specific variables are shown in Table 1.

Table 1. Definition table of each variable

variables	symbol	Definition
enterprise performance	EP	Return on equity = net profit/average shareholders' equity
Digital transformation	DT	The frequency of the segmentation indicators of digital transfor-

		mation in the National Tai 'an database is added to one and processed logarithmically
Absorptive capacity	AC	R&D expenditure/operating income
Enterprise size	Size	Total assets take natural logarithm
Asset-liability ratio	Lev	Ending total liabilities/ending total assets
Enterprise growth	Growth	revenue growth rate

4 Model construction

Model 1 is a basic model to examine the direct impact of digital transformation on the performance of textile enterprises. In order to study the mediating role of dynamic capability, Model 3.2, which analyzes the impact of digital transformation on absorptive capacity, and Model 3.3, which analyzes the impact of dynamic capability on textile enterprise performance, are constructed. Model 3.2 and Model 3.3 jointly verify the mediating role of dynamic capability.

$$EP_{it} = C + a_1 DT_{it} + \beta_1 SiZE_{it} + \beta_2 Lev_{it} + \beta_3 Growth_{it} + \varepsilon_{it} \quad (1)$$

$$DC_{it} = C + a_2 DT_{it} + \beta_1 SiZE_{it} + \beta_2 Lev_{it} + \beta_3 Growth_{it} + \varepsilon_{it} \quad (2)$$

$$EP_{it} = C + a_3 DT_{it} + a_4 DC_{it} + \beta_1 SiZE_{it} + \beta_2 Lev_{it} + \beta_3 Growth_{it} + \varepsilon_{it} \quad (3)$$

Among them, i represents different enterprises, t represents different time.

5 Correlation analysis

In order to explore the closeness of the relationship between variables, this paper takes enterprise performance (EP) as the dependent variable and conducts correlation analysis with digital transformation (DT), absorptive capacity (AC) and other control variables after standardization. The correlation analysis is shown in Table 2.

Table 2. Phase relationship of each variable

	DT	AC	Size	Growth	Lev	EP
DT	1					
AC	.487**	1				
Size	.334**	.329**	1			
Growth	.031	.276*	-0.106	1		
Lev	-.14	-.142	.028	.037	1	
EP	.489**	.597**	.167	.485**	-.231	1

* At level 0.05 (two-tailed), the correlation was significant. ** At level 0.01 (two-tailed), the correlation was significant. As shown in Table 2, Pearson correlation analysis method was used to observe that digital transformation was significantly correlated with absorptive capacity ($r=0.487$, $p<0.01$) and enterprise performance ($r=0.489$, $p<0.01$). Absorptive capacity was significantly correlated with firm performance

(r=0.597, p<0.01). The above conclusions preliminarily verified hypotheses H1, H2, and H3.

To avoid multicollinearity problems, all independent variables and control variables were tested (VIF), VIF values are all less than 5, that is, there is no serious multicollinearity problem among all independent variables and control variables.

6 Regression analysis among variables

In order to further prove whether there is a causal relationship between variables. Regression analysis of variables is performed in this section.

6.1 Regression analysis of DT on EP and AC

This paper controls the variables that may affect enterprise performance, such as enterprise size, enterprise growth and asset-liability ratio, and puts digital transformation, absorptive capacity, and enterprise performance into the linear regression model. The coefficients were all standardized regression coefficients, as shown in Table 3.

Table 3. Results of regression analysis

Dependent variable		EP		AC	
		Model 1	Model 2	Model 3	Model 4
Control variables	Size	0.229*	0.085	0.368**	0.235*
	Growth	4.957***	0.489***	0.321**	0.293**
	Lev	-2.465*	-0.193*	-0.164	-0.105
Independent variable	DT		0.419***		0.384**
	R square	0.35	0.501	0.233	0.36
	Adjusted R square	0.317	0.467	0.195	0.317
	F	10.765	14.807	6.076	8.303

* At level 0.05 (two-tailed), the correlation was significant. ** At level 0.01 (two-tailed), the correlation was significant. *** At level 0.001 (two-tailed), the correlation was significant.

The results show that model 2 shows that digital transformation has a positive effect on enterprise performance (r=0.419, p<0.001), that is, hypothesis H1 is verified, and model 4 shows that digital transformation has a significant positive impact on absorptive capacity (r=0.384, p<0.01), that is, hypothesis H2 is verified.

6.2 Regression analysis of AC on EP

The absorption capacity is taken as the independent variable, and the enterprise performance is taken as the dependent variable in the linear regression model in study. The results are shown in Table 4.

Table 4. Absorption capacity regression analysis table

Dependent variable		EP	
		Model 5	Model 6
Control variables	Size	0.229*	0.066
	Growth	0.519***	0.376***
	Lev	-0.257*	-0.184
	AC		0.446***
	R square	0.35	0.502
	Adjusted R square	0.317	0.469
	F	10.765	14.894

As can be seen from Table 4, absorptive capacity has a significant positive impact on enterprise performance (r=0.446; p<0.001), that is, hypothesis H3 is verified.

7 Intermediate effect test

This paper use Bootstrap method to test the mediating effects. The sample size of Bootstrap was selected to 5000, and the operation was carried out within 95% confidence interval. The results are shown in Table 5.

Table 5. Mediation model of absorptive capacity (Bootstrap standardization)

variables	Model 7		Model 8		Model 9	
	β	t	β	t	β	t
DT	0.489	4.418***	0.487	4.385***	0.260	2.313*
AC					0.471	4.178***
R2	0.239		0.237		0.409	
F	19.518***		19.227***		21.075***	

Note: (1) Bootstrap test *, p<0.05, **, p<0.01, ***, p<0.001. (2) Model 7- Digital transformation predicts enterprise performance; Model 8- Digital transformation predicts absorption capacity; Model 9- Digital transformation and absorptive capacity co-predict business performance.

As can be seen from Table 5, digital transformation can significantly positively predict absorption capacity (β=0.487, t=4.385, p<0.001). When both digital transformation and absorptive capacity are included in the regression equation, both digital transformation (β=0.034, t=2.313, p<0.05) and absorptive capacity (β=3.433, t=4.178, p<0.001) can significantly positively predict enterprise performance.

Moreover, Bootstrap95%CI of intermediary effect did not include 0 ([0.101, 0.348]), indicating that the intermediary effect was significant, while the direct effect was significant. Therefore, absorption capacity played a partial intermediary role in the impact of digital transformation on enterprise performance, and the intermediary effect accounted for 36.31% of the total effect. The results verify hypothesis 3a, and the analysis of the mediation effect of absorption capacity is shown in Table 6.

Table 6. Analysis table of mediating effect of absorption capacity

	Effect size	BootSE	BootLLCI	BootULCI	Effect ratio
Total effect	0.489	0.0143	0.035	0.092	
Direct effect	0.260	0.0145	0.005	0.063	
Indirect effect	0.229	0.0632	0.101	0.348	46.83%

8 Conclusions

The digital transformation of textile enterprises has become the main factor to promote the performance development of textile enterprises. this paper adopts text analysis method to construct enterprise digital transformation index from 2018 to 2022, and conducts regression analysis to empirically test how the digital transformation of textile enterprises affects their enterprise performance. The main conclusions are as follows: the digital transformation of textile enterprises can significantly promote the performance of textile enterprises., and absorptive capacity plays a partial intermediary role between enterprise digital transformation and enterprise performance.

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