Research on the Influence of Digital Transformation on the Sustainable Development of China's Textile and Apparel Listed Enterprises

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Abstract: As a high-energy-consumption industry, China's garment industry is of great significance to promote the innovation and upgrading of traditional enterprises with the help of the Internet of Things, big data and artificial intelligence in the era of digital economy, so as to achieve sustainable development. Based on this, this paper takes textile and garment enterprises as the research object, collects relevant data of 62 textile and garment listed companies in China from 2017 to 2020, and conducts empirical analysis with the help of static panel model. The results show that digital transformation, as the core explanatory variable of the model, has a significant role in promoting the sustainable development of enterprises. In addition, the improvement of the profitability of the control variable and the enhancement of the performance of corporate social responsibility have a positive role in promoting the sustainable development of enterprises. Based on the above research results, in order to achieve sustainable business development, textile and garment enterprises should strengthen industrial integration with emerging digital industries, realize industrial restructuring with the help of digital transformation, and continue to move towards high-end technology-intensive production methods. At the same time, they should pay attention to profitability. To improve the level of production and operation, while obtaining high profits in production and operation, we should also pay attention to social needs and actively perform our responsibilities and obligations to the public.

Keywords: Enterprise Sustainability, Digital Transformation, Profitability, Enterprise Social Responsibility.

1 INTRODUCTION

In the context of today's new era, digitalization is gradually driving the prosperity of the economy and society. With the continuous development of economic globalization, the competition among garment enterprises has become increasingly prominent, and the innovation and transformation of traditional production models with the help of science and technology has become the only way for enterprises to achieve sustainable and efficient development.

Based on the existing literature, scholars' research on digital transformation is mainly divided into three aspects. On the one hand, some scholars start from the background and current situation of digital transformation to carry out research through investigation and analysis. For example, scholar Miao Guxian (2019), based on the development status of the era of intelligence, clarified that digital technology can be used in the production process of clothing products by

collecting end consumers. Demand information, reversely promote the efficient development of the clothing industry chain, and put forward a digital enterprise model with the industrial Internet as the core.[1] Antonio Gonzalo et al. (2020) conducted a consumer survey and analyzed the sales of the fashion industry before and after the epidemic, and pointed out that companies with a higher degree of digitalization can better face the impact of the epidemic, and digital transformation has become a core element of the company's strategy. The contactless economy in the post-epidemic era will become the next new normal.[2]

On the other hand, some scholars conduct research by combining models. For example, scholars Pan Jian, Yu Haoqi, etc. (2021) analyzed the relevant data of the clothing industry and combined the C2M model to analyze the robustness and stability of the digital closed-loop structure in the production and transaction process of the clothing industry. Efficiency further demonstrates the positive effect of realizing digital transformation on promoting the high-quality development of garment enterprises.[3] P N Sabrina et al. (2019) demonstrated the important contribution of high-skilled electronic technology in the apparel value chain by studying the role of an electronic supply chain management model in the Indonesian apparel industry.[4] In addition, some scholars conduct investigation and analysis from a specific research object. For example, Bao Songyuan and Li Genqin (2021) took Y Group as an example, and by studying its development path in digital transformation, they proposed to build a digital platform and improve digitalization. The management mechanism and the training of digital technical talents play an important role in the macro development of traditional clothing enterprises.[5]

However, digital research with the apparel industry as the main research object is still very limited. Therefore, this paper takes China's A-share listed textile and apparel companies as a research sample, and takes digital transformation as the core explanatory variable to further increase corporate profitability and corporate society. Taking the degree of responsibility fulfillment as a control variable, the empirical analysis is carried out by establishing a multivariate linear panel model, in order to provide reference and reference for apparel enterprises to seek a new development path of continuous innovation.

2 THEORETICAL ASSUMPTIONS

The theories involved in this paper include industrial convergence theory and stakeholder theory. Industrial integration is a model that promotes economic growth on the basis of mutual cooperation through different industries based on the same production chain. Scholar Hu Yibo (2020) believes that, based on the theory of industrial integration, the cost of information collection is reduced through digital transformation of enterprises, and the sharing economy further strengthens the closeness of the blockchain.[6] Stakeholders refer to individuals or groups that are related to the interests of the organization. The scholar Gao Honghui (2003) believes that stakeholders are both profit-seekers and corresponding risks in enterprise operations.[7] The stakeholder theory emphasizes that an enterprise should realize the mutual promotion and reciprocity of the stakeholders involved in the operation process and fulfill its social responsibilities in production, so as to achieve sustainable development.

Based on the above research, this paper puts forward the following hypotheses:

H1: Digital transformation has a positive effect on the sustainable development of enterprises.

H2: Profitability has a positive effect on the sustainable development of enterprises.

H3: Corporate social responsibility has a positive effect on the sustainable development of enterprises.

3 RESEARCH DESIGN

3.1 Data Description

Taking into account the availability of data, the research sample selected in this paper is China's A-share listed textile and garment companies from 2017 to 2020, and the samples are screened as follows: (1) Excluded companies whose names are marked with ST or *ST before delisting. (2) Excluded companies with missing important indicators due to incomplete corporate information disclosure; (3) Excluded companies with zero denominator in the formula calculation; after elimination, a total of 62 listed companies were obtained as research objects.

Data source: The company name, ROE and the data required to calculate the sustainable growth rate are all from the website of the China Business Industry Research Institute; the annual reports of listed companies from 2017 to 2020 were collected from www.cninfo.com to measure the degree of digital transformation of enterprises; the total score of corporate social responsibility comes from Hexun.com.

3.2 Variable Selection

The explanatory variable in this paper is Enterprise Sustainability (SUS), the core explanatory variable is Enterprise Digital Transformation Capability (DT), and the control variables are Profitability (ROE) and Enterprise Social Responsibility Fulfillment (CSR).

Table 1. definition and basis of variables(owner-draw)

Variable type	Variable name	Variable symbol	Calculation
Explained variable	Enterprise Sustainability	SUS	Sustainable Growth Rate = Sales Net Profit rate × Total Asset Turnover Rate × Equity Multiplier × Retained Rate of Return / 1- (Net Sales Rate × Total Asset Turnover Rate × Equity Multiplier × Retained Rate of Return)
Explanatory variable	Enterprise Digital Transformation Capability	DT	Text Analysis
	Profitability	ROE	Roe
Control variable	Enterprise Social Responsibility Fulfillment	CSR	Enterprise Social Responsibility Total Score

3.3 Model Building

In this paper, a multivariate linear panel model is established based on the above variables, and the expression is as follows:

$$SUS = \alpha + \beta * DT + \gamma * ROE + \delta * CSR + \varepsilon$$

Among them, SUS represents the Enterprise Sustainability, DT represents the Enterprise Digital Transformation Capability, ROE represents the Profitability, CSR represents the Enterprise Social Responsibility Fulfillment, and ε represents the Random Error Term. α is the Intercept Term, β is the Coefficient of the Core Explanatory Variable, and γ and δ are the Coefficients of the Control Variable.

4 EMPIRICAL RESULTS AND ANALYSIS

4.1 Descriptive Statistics

The sample in this paper comes from the data of the four years from 2017 to 2020. The total number of observations is 248. According to the statistics, the following results are obtained in Table 2: the maximum value of the Enterprise Sustainability is 107.65%, and the minimum value is -50.06% , through the comparison of the maximum value and the minimum value, it can be found that there is a big difference in the sustainable development ability of different enterprises. In addition, there is a widening gap in the Digital Transformation Capability, Profitability and Enterprise Social Responsibility Fulfillment of different companies. To sum up, it can be found that the research samples in this paper have different degrees of attention to the variables involved and there are large differences. This phenomenon is conducive to making the results of the research more obvious and representative, and further lays the foundation for the accuracy of the empirical analysis.

Table 2. descriptive statistics of variables(owner-draw)

Indicators	Average	Maximum value	Minimum value	Median	Variance	Standard deviation
SUS (enterprise sustainability)	37.87%	107.65%	-50.06%	38.03%	4.37%	20.96%
DT (enterprise digital transformation capability)	8.31	45.00	0.00	6.00	66.74	8.19
ROE (profitability)	6.79%	32.51%	-72.92%	6.22%	1.05%	10.27%
CSR(enterprise social responsibility fulfillment)	22.69	37.56	-5.10	23.87	78.49	8.88

4.2 Static Panel Model Estimation Analysis

In order to judge the type of the model, this paper uses the measurement software to carry out the Hausman test, and the results show that the P value is 0.0016 < 0.01, that is, the null hypothesis is rejected at the 99% confidence level, so the model is a fixed effect model. Further, through the fixed-effect variable intercept model test, the following results are obtained: the coefficient

of Enterprise Digital Transformation Capability is 0.0029, and the P value is 0.0285 < 0.05; the coefficient of Profitability is 0.3089, and the P value is 0.0072 < 0.05; the coefficient of Enterprise Social Responsibility Fulfillment is 0.0037, and the P value is 0.0217<0.05. In summary, the coefficients of the variables pass the test, and the model is a fixed-effect variable-intercept model.

In addition, in order to test the robustness of the model construction, this paper conducts stepwise regression by establishing model (1), model (2), and model (3). From model (1) to model (4), the result of R2 keeps increasing and gets closer and closer to 1, indicating that adding control variables is beneficial to improve the fitting effect of the model, and model (4) is robust.

Table 3. regression results of benchmark model(owner-draw)

Variable	Model (1) SUS	Model (2) SUS	Model (3) SUS	Model (4) SUS
DT	0.0073*** (4.4656)	0.0053*** (3.6589)	0.0039*** (2.7184)	0.0040*** (2.8224)
ROE		0.9510*** (8.5333)		0.4550*** (3.0966)
CSR			0.0122*** (9.5340)	0.0085*** (4.9004)
Individual effect	Control	Control	Control	Control
Sample size	124	186	186	248
R^2	0.0750	0.2869	0.3253	0.3508
Adjusted R^2	0.0712	0.2811	0.3198	0.3428

Note: The numbers in parentheses are the t-values of the variables in the variable significance test, ***, **, * are significant at the confidence levels of 0.01, 0.05, and 0.1, respectively.

4.3   Analysis of Estimated Results

The coefficient of Enterprise Digital Transformation Capability is 0.0040. Under the condition that other conditions remain unchanged, for every 1 unit increase in the corresponding indicator of Enterprise Digital Transformation Capability, the sustainable growth rate of the enterprise increases by an average of 0.0040 units; P value = 0.0052, less than 0.01, that is At the confidence level of 0.01, the coefficients of the variables pass the test, and the Enterprise Digital Transformation Capability is a significant factor affecting the sustainable development capability of the enterprise, which is in line with the hypothesis H1.

The coefficient of Profitability is 0.4550. Under the condition that other conditions remain unchanged, for every 1 unit increase in the return on equity of the enterprise, the sustainable growth rate of the enterprise increases by 0.4550 units on average; P value = 0.0022, less than 0.01, that is, in the At the confidence level, the coefficients of the variables pass the test, and Profitability is a significant factor affecting the sustainable development ability of enterprises, which is in line with the hypothesis H2.

The coefficient of the degree of corporate social responsibility fulfillment is 0.0085. Under the condition that other conditions remain unchanged, for every 1 unit increase in the total corporate social responsibility score, the sustainable growth rate of the company increases by 0.0085 units on average; P value = 0.0000, less than 0.01, that is At the confidence level of 0.01, the coefficients of the variables pass the test, and the degree of corporate social responsibility performance

is a significant factor affecting the sustainable development capability of enterprises, which is in line with hypothesis H3.

In addition, through the significance test of the equation, it can be found that the P value of F = 0.000000, which is less than 0.01, that is, the equation is significant at the confidence level of 0.01. In the goodness of fit test, R2 = 0.350815, adjusted R2 = 0.342833, the degree of fit is general.

As mentioned above, the empirical results confirm the hypothesis that Digital Transformation, Profitability, and Corporate Social Responsibility all have positive effects on corporate sustainability.

5   CONCLUSIONS

5.1   Model Inspirations

First, the Enterprise Digital Transformation Capability has a positive role in promoting the sustainable development of enterprises. Apparel enterprises should combine the digital economy to promote the transformation and upgrading of enterprise structure. In the Internet era, the digital economy has become an important driving force for the high-quality development of the national economy. With the help of big data enterprises, the efficiency of resource aggregation and integration has been improved. Based on the specialized classification and processing of huge information bases, enterprises can better absorb the required information and promote the steady development of their internal operations.

Second, the enhancement of the Enterprise Profitability is conducive to the sustainable development of enterprises. Apparel companies should pay attention to the important factors that affect profitability to promote continuous and steady growth of profitability. As an endogenous driving force, the improvement of corporate profitability promotes companies to maintain their competitive advantages in existing fields, and provides sufficient financial support for companies to explore emerging fields, so that companies can make timely adjustments based on the needs of the times and keep pace with the times. In the forefront of the industry.

Third, the fulfillment of corporate social responsibility empowers the sustainable development of enterprises. Apparel enterprises should actively fulfill their social responsibilities and disclose social responsibility reports as required, so as to promote the proliferation of corporate images and achieve a win-win situation between enterprises and society. Symbiosis. In addition to the return that the company should give based on the financial support made by shareholders to the company, the company should also bear due responsibilities to its employees, suppliers, consumers and the environment.

5.2   Policy Recommendations

(1) Promote the digital transformation of enterprises and contribute to the sustainable development of the economy and society. Apparel enterprises should speed up the construction of smart factories and introduce digital equipment to improve production efficiency. At the same time, the traditional production and sales model should be changed, an e-commerce platform should be established with the help of the Internet, and the online after-sales management mechanism

should be strengthened to improve customer stickiness. On the other hand, the government should provide policy guarantees for the innovation and development of clothing enterprises, promote enterprise-school alliances between enterprises and universities, cultivate intelligent professionals, and inject fresh blood into the traditional clothing industry.

(2) Promote the enhancement of profitability, in order to achieve profit growth and improve corporate efficiency. Profitability reflects the ability of an enterprise to realize capital growth based on existing capital. The scale and product structure of an enterprise will have varying degrees of impact on the profitability of an enterprise. Apparel enterprises should pay attention to expanding their business scope, building brand awareness, and attracting more powerful capital. In addition, the sense of design is the focus of consumers in the new era. Clothing enterprises should pay attention to enriching the product structure and actively promote cross-border cooperation. On the other hand, the government should provide financial support for small and medium-sized garment enterprises to help them grow and expand. At the same time, it should also pay attention to the operating conditions of large enterprises and encourage them to play a leading role in order to avoid vicious competition.

(3) Attach importance to the fulfillment of corporate social responsibility and promote the harmonious development of the enterprise and society. Apparel enterprises should regularly check and update old equipment, strengthen sewage systems, and actively carry out environmental protection training for employees. In addition, a recycling mechanism should be established to promote the secondary use of clothing. In addition to the responsibility for the environment, garment enterprises should increase their sense of belonging to the company by increasing employee benefits, and resist the impact of disasters together with the country by carrying out public welfare undertakings. On the other hand, the government should strengthen the supervision of enterprises, at the same time broaden the reporting channels, and update the reward and punishment plan in a timely manner, so as to ensure the timeliness and rationality of the plan.

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