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The impact of digital transformation on accounts receivable turnover rate

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Abstract. With the development of modern information technology, digital transformation has become an inevitable trend for enterprise development. As a natural data center, the finance department is the primary point of breakthrough and a key focus of digital transformation. This paper employs an empirical analysis method, using the accounts receivable turnover rate of A-share non-heavy-polluting manufacturing listed companies from 2021 to 2023 as the dependent variable and the degree of enterprise digital transformation as the independent variable for regression analysis. Through research, it is concluded that digital transformation will inhibit the accounts receivable turnover of enterprises by affecting the sales expense ratio and the proportion of R&D investment. After replacing the explained variable twice with different data collection methods, the robustness test still holds. This study shows that the digital transformation process has an undeniable negative impact on enterprises, and enterprises should enhance their crisis prevention awareness to reduce transformation costs.

Keywords: digital transformation, accounts receivable turnover rate, text analysis method

1. Introduction

Driven by modern information technology, digital transformation has become an inevitable trend in enterprise development, and the finance department is often the primary point of breakthrough for transformation. The accounts receivable turnover ratio, a key indicator of working capital management efficiency, needs to be verified to determine whether it is affected by digital transformation.

The "Accounting Informationization Development Plan (2021-2025)" mentions that digital transformation can expand accounting functions and enhance efficiency. However, existing literature has conducted relatively few studies on the intersection of these two areas. Given the risks associated with digital transformation, this paper explores its negative relationship with the accounts receivable turnover rate through empirical analysis, aiming to fill the research gap and raise enterprises' awareness of transformation risks.

2. Literature review and theoretical analysis

2.1. Influencing factors of enterprise digital transformation

Current research has summarized the factors that prompt enterprises to undergo digital transformation from various perspectives. From a macro perspective, environmental changes are significant driving forces. For instance, the advancement of regional market integration forces enterprises to accelerate their digital transformation to better integrate into the market competition. From an intermediate perspective, the influence on the organizational behavior level cannot be ignored. With the development of digitization, the supply chain can operate efficiently and integrate resources. This phenomenon meets the needs of cost management requires. From a micro perspective, internal factors of the enterprise also need to be given special consideration. The enterprise has been affected by various reasons since the beginning of its transformation [1-4].

2.2. The influencing factors of accounts receivable turnover rate

The ratio is an indicator that measures the ratio of net sales on credit to the average accounts receivable balance of an enterprise over a certain period.The influencing factors can be considered from both internal management and external effects. For the

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internal control of the enterprise, whether the credit management of the enterprise is complete, the customer management strategy orientation, and other systems need to be carefully considered. customer management strategies, etc., while external factors involve the macroeconomic environment, industry competition situation, etc [5]. These factors can be further classified into traditional factors and emerging factors. Traditional factors such as inadequate customer credit management have always constrained the efficiency of accounts receivable management [6]. Emerging factors brought new ideas and methods to accounts receivable management. Big data analysis is a case in point [7].

2.3. Research on the impact of digital transformation on accounts receivable

The relevance of digital revolution and corporate working capital management is divided into two opposing views. The negative correlation existing between the two research indicators has been studied and disclosed by some literature. For instance, customers' adoption of digital transformation reduces the relative bargaining power of enterprises, thereby imposing constraints on the efficiency of enterprises' working capital management [8]. However, other studies present an opposing view: suggesting that through the implementation of effective measures, digitization offers an important opportunity for the dynamic adjustment of operating funds such as alleviating financing constraints and thereby have a positive impact on enterprises' accounts receivable management [7].

In light of the above research, the hypothesis proposed is that the digitalization development of enterprises has an inhibitory effect on the specific financial indicator of accounts receivable turnover rate.

3. The setup of the process

3.1. Selection of samples

From 2021 to 2023, the non-polluting A-share manufacturing enterprises were selected as panel data. The CNRDS database and the companies' balance sheets and income statements provided us with the necessary variable samples and data. The data analysis software used is Stata 18. During the sample selection process, companies classified as ST, financial companies, and those with abnormal or missing financial data were excluded, and the data was truncated by 1%. Finally, 6,550 valid sample data were obtained.

3.2. The construction of variables

3.2.1. Definition of variables

The data of the Dependent variable, Accounts receivable turnover rate (ART), is taken from the CNRDS database. The Independent variable, Digital transformation degree (DCG), is obtained through text analysis methods [9]. Using four dimensions: big data technology utilization degree, big data intelligence creation, network business model and information management and information system, 99 digital-related words were counted. At the same time, taking the logarithm of the frequency plus 1, the final result is obtained.

The Control variables (Controls) selected for this study are: Customer Concentration (CC), Listing age (AGE), Scale (SIZE), Asset-liability ratio (LEV),Board size (Boardsize), Proportion of independent directors (DDZB), Increase rate of business revenue (Growth), and Return on the equity (ROE). The Mediator variables M are: The sales expense ratio (Sfee) and Proportion of research and development investment (RD), and ε is the error term. See Table 1.

Table 1. Variables connotation and calculation

Variables	name	symbol	definition
Dependent variable	Accounts receivable turnover rate	ART	Operating income /((Initial receivables + ending receivables) /2)
Independent variable	Degree of digital transformation	DCG	Take the logarithm of (the word frequencies related to big data +1)
Mediator variable	The sales expense ratio	Sfee	Sales expenses/operating income
	Proportion of research and development investment	RD	Research and development expenses/operating income
Control variable	Customer Concentration	CC	The proportion of sales for the top five customers
	Listing age	AGE	The number of years from listing to the end of the period plus one logarithm
	Scale	SIZE	Logarithm (The asset balance as of the balance sheet date +1)
	Number of directors	Board size	The quantity of directors
	Proportion of independent directors	DDZB	The percentage of board members who are independent directors
	Increase rate of business revenue	Growth	The operating income for the current year/Previous year's operating income -1
	Asset-liability ratio	LEV	Debt balance / Asset balance
	Return on the equity	ROE	The net profit/The average net assets

3.2.2. Model building

The regression model is established for the purpose of hypothesis testing in this paper:

$$ART = a_0 + a_1 \times DCG + a_2 \times Controls + \varepsilon \tag{1}$$

$$ART = \beta_0 + \beta_1 \times DCG + \beta_2 \times Controls + \beta_3 \times M + \varepsilon \tag{2}$$

$$M = \mu_0 + \mu_1 \times DCG + \mu_2 \times Controls + \varepsilon \tag{3}$$

Firstly, a benchmark regression model is constructed to test the direct relationship between the degree of digital transformation and the accounts receivable turnover rate. How effective is the transformation,whether to control the variable, and error terms are the elements that make up this model.See Equation (1).

Secondly, a regression model with Mediator variables was constructed. The sales expense ratio and the proportion of research and development investment were included as Mediator variables in the model to explore the path through which digital transformation affects the accounts receivable turnover rate by means of these two Mediator variables.See Equation (2).

Finally, a regression model was constructed to link the Mediator variable with the degree of transformation and to test how digital transformation affects the Mediator variable.See Equation (3).

4. Empirical analysis

4.1. Descriptive statistics

This article conducted descriptive statistical analysis on the selected 10 variables, with each sample size being 6,550 (See Table 2). Statistical analysis revealed that the accounts receivable turnover rate was averaged at 31.97. The standard deviation was 570.6. The value that is the minimum was 0.29 and the maximum value was 29183. Its coefficient of variation reached 17.85, which was significantly higher than that of other variables. This reflects that the accounts receivable turnover rates of different enterprises vary in their turnover situations. Significant numerical differences are also evident in the digitization indicators. The remaining values of the control variables are all presented in a reasonable and normal range.

Table 2. Descriptive statistics

variable	sample size	Average value	standard deviation	minimum value	maximum value
ART	6,550	31.97	570.6	0.29	29,183
DCG	6,550	3.59	0.95	0.69	6.05
AGE	6,550	9.901	7.84	1	31
SIZE	6,550	12.86	1.18	9.18	18.43
Boardsize	6,550	8.03	1.48	5	14
DDZB	6,550	38.15	5.427	30	57.14
CC	6,550	38.13	23.23	1.43	97.60
Growth	6,550	12.97	33.58	-61.18	200.3
LEV	6,550	38.04	18.86	1.883	99.16
ROE	6,550	3.51	34.13	-1,142	475.9

4.2. Correlation analysis

The account receivable turnover rate (ART) decreases with the higher degree of digital transformation (DCG) , with a correlation coefficient of -0.036***($p<0.01$), showing a significant negative correlation (See Table 3). This result fundamentally supports the proposed hypothesis. Apart from the proportion of independent directors (DDZB), the increase rate of business revenue (Growth), and asset-liability ratio (LEV), all the other control variables in this study are significantly correlated with accounts receivable .

Table 3. Correlation analysis

	ART	DCG	CC	AGE	SIZE	Board size	DDZB	Growth	LEV	ROE
ART	1									
DCG	-0.036***	1								
CC	-0.027**	-0.107***	1							
AGE	0.068***	-0.005	-0.221***	1						
SIZE	0.047***	0.156***	-0.184***	0.466***	1					
Board size	0.059***	0.017	-0.088***	0.238***	0.274***	1				
DDZB	-0.01	0.036***	0.009	-0.028**	-0.027**	-0.570***	1			
Growth	0.005	-0.035***	0.092***	-0.075***	0.081***	0.029**	-0.01	1		
LEV	-0.014	0.115***	-0.053***	0.321***	0.420***	0.111***	0.001	0.110***	1	
ROE	0.027**	0.018	-0.029**	-0.068***	0.063***	-0.012	0	0.139***	-0.223***	1

4.3. Analysis of regression results

Without considering the existence of control variables, a regression analysis was conducted on the benchmark regression model (See Table 4).The outcomes of the statistical analysis indicate that, at a 99.99% confidence level, the regression coefficient of the digital transformation degree is signally negative.This means that for every 1 percentage point increase in the degree of digital transformation, the accounts receivable turnover rate would decrease by approximately 20 percentage points on average. This result validates the hypothesis proposed in this paper.

Table 4. Benchmark regression

variable	(1)	(2)
	ART	ART
DCG	-21.816***	-23.239***
	(-2.95)	(-3.07)
CC		-0.286
		(-0.91)
AGE		4.017***
		(3.77)
SIZE		12.452*
		(1.66)
Boardsize		22.703***
		(3.70)
DDZB		2.946*
		(1.84)
Growth		0.126
		(0.58)
LEV		-1.254***
		(-2.87)
ROE		0.326
		(1.50)
Constant	110.201***	-323.392***
	(4.02)	(-2.68)
Observations	6,550	6,550
R-squared	0.001	0.011
F test	0.00317	0
r2_a	0.00118	0.00969
F	8.711	8.122

In the regression analysis with the introduction of Mediator variables, a two-step method was used to test the sales expense ratio and proportion of research and development investment as Mediator variables separately (See Table 5).The results showed that the sales expense ratio had a positive effect on the accounts receivable turnover ratio , while the degree of digital transformation suppressed the sales expense ratio, thereby directly inhibiting the accounts receivable turnover rate of the enterprise; the Proportion of research and development investment directly inhibited the accounts receivable turnover rate, and there was a conspicuous positive relationship between enterprises implement digitalization and what is the proportion of research and development investment.

Table 5. Mediating effect test

variable	(1)	(2)	variable	(1)	(2)	(3)
	Sfee	ART		RD	ART	ART
DCG	-1.120***	-64.509**	DCG	0.006***		-61.221**
	(-4.21)	(-2.48)		(4.99)		(-2.36)
Sfee		6.357**	RD		-1,985.587***	-1,811.464***
		(2.52)			(-3.49)	(-3.16)
Controls	yes	yes	Controls	yes	yes	yes
Constant	35.399***	-774.075**	Constant	0.024	-553.183	-514.697
	(9.06)	(-1.99)		(1.37)	(-1.46)	(-1.36)
Observations	1,488	1,488	Observations	1,483	1,483	1,483
R-squared	0.203	0.029	R-squared	0.060	0.027	0.031
F test	0	4.83e-06	F test	0	5.06e-06	1.16e-06
r2_a	0.198	0.0221	r2_a	0.0545	0.0214	0.0244
F	41.72	4.359	F	10.49	4.605	4.713

4.4. Robustness test

To ensure the reliability of the research results, this paper follows the approaches of others [10-11], and adopts different data collection methods to form word frequency C and word frequency A to replace the degree to which transformation has taken place. Hypotheses are then re-tested. See Table 6.The results presented the regression coefficients of the degree of digitization derived from the two types of word frequencies is markedly negative. The regression coefficient of the digital transformation degree constituted by word frequency C is -17.77, which is statistically significant (t = -3.36), and the constant term is -350.51 (t = -2.92); The digital transformation degree's regression coefficient constituted by word frequency A is -10.71 (t = -1.93), and the constant term is -366.55 (t = -3.05). This indicates that the construction of a complete benchmark regression model. The robustness of the research results has been verified.

Table 6. Robustness test

variable	(1)C	(2)A
DCG	-17.77***	-10.71*
	(-3.36)	(-1.93)
Controls	yes	yes
Constant	-350.51***	-366.55***
	(-2.92)	(-3.05)
Obs	6,550	6,550
r2_a	0.01	0.01

5. Conclusion

The paper selected A stock market free from contamination manufacturing-listed companies from 2021 to 2023 as the sample. Through word frequency statistics, this paper measures the degree of digital transformation of enterprises. Given the empirical results data, digital transformation will deeply inhibit the accounts receivable turnover rate, and this conclusion was verified by robustness tests, indicating that the transformation might have a negligible negative impact on the enterprise's accounts receivable management. The study has limitations, such as the sample not covering small corporation at the very beginning of the transformation process and the difficulty of reflecting the depth of technology application through word frequency measurement of transformation degree. In the future, the sample range can be expanded, and more precise transformation measurement indicators can be explored for in-depth research. When enterprises promote transformation, they need to pay attention to the potential inhibitory effect on accounts receivable turnover, optimize management strategies to balance technology application and capital efficiency, and achieve sustainable development.

For enterprises, when promoting digital transformation, they must fully recognize the potential inhibitory effect on the efficiency of accounts receivable turnover. They should specifically optimize customer credit management, sales strategies, and

research and development investment allocation, formulate risk prevention measures in advance, and balance the application of technology and the efficiency of working capital management during the transformation process to achieve sustainable development.

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