

# The Impact of Digital Transformation on Corporate Short Term Lending and Long Term Investment -A Sample Analysis Based on Chinese A-share Listed Companies

Duo Xu, Tiantian Xu, Xueqian Zhang, Yuanyuan Cai and Jun Xie

School of Anhui University of Finance and Economics, Bengbu, 233000, China

---

**Abstract:** The lack of effective management of the planning and scheduling of funds by enterprises can lead to the emergence of short term loans and long term investments. Although short term loans and long term investments allow enterprises to arrange funds more flexibly and easily, they can seriously endanger the healthy and stable development of enterprises. Therefore, it is important to improve the current situation of the proliferation of short term loans and long term investments. In this paper, we study the economic effects of digital transformation on enterprises' short term loans and long term investments. Firstly, the collected sample data - 11-year financial data of Shanghai and Shenzhen A-share companies from 2011-2021 - are processed to make the data more realistic and representative, and then the data are empirically tested and regression analyzed using Stata and Spss software to study the effect of digital transformation on short loans and long investments of enterprises. The results of the study show that: digital transformation of enterprises can effectively inhibit enterprises' short loans and long investments; the larger the scale of enterprises and the larger the asset-liability ratio, the greater the possibility of enterprises' short loans and long investments. Finally, based on the research findings, recommendations are drawn: enterprises should allocate funds rationally; enterprises should expand the scale advantage of internal talents; the government should provide policy support for enterprises' digital transformation; and the internal and external market environment should be optimized.

**Keywords:** Short term lending and long term investment, Digital transformation, Regression analysis.

---

## 1. Introduction

At present, many enterprises will continue to carry out large-scale and fast industrial expansion in order to obtain more economic benefits, which will certainly increase the capital needs of enterprises. At the same time, most Chinese enterprises mainly rely on banks and other financial institutions for financing, and the loans from financial institutions can be divided into long-term loans and short-term loans according to the length of time, among which the long-term project loan approval procedures are very cumbersome, while the short-term credit financing procedures are much easier, and as enterprises in the process of rapid expansion, they naturally prefer short-term credit financing to meet their capital needs. As a company in the process of rapid expansion, it naturally prefers short-term credit financing to meet its capital needs. In addition, due to the lack of professional personnel or insufficient attention, enterprises lack effective management in planning and scheduling of funds; banks may blindly issue loans for enterprises in competition for their own interests. These situations prompt enterprises to choose short term loans and long term investments to meet the capital needs for production and development.

Short term loans and long term investments refer to enterprises borrowing short-term loans from banks and other financial institutions for long-term production inputs, which is beneficial in that it allows enterprises to arrange funds more flexibly and easily, but it has great hazards: it will increase the cost of debt financing, reduce the profitability of enterprises, increase the degree of over-investment, thus increasing the risk of default on debt[1]; it will increase the probability of

financial risks. In addition, after the short loan and long investment, if the expected return is not achieved, it will lead to the enterprise to maintain low profits or losses for a long time, which will also lead to the enterprise can not pay off the loan, and have to renew the loan year after year to transfer the loan, thus carrying a heavy debt. Therefore, it is important to reduce the degree of short loans and long investments for the healthy and stable development of enterprises, and with the advent of the digital era, the digital transformation of enterprises will become a new way to improve the current situation of short loans and long investments.

Enterprise digital transformation refers to the change measures that enterprises use digital technology to drive their own transformation of business models, organizational frameworks, corporate culture, etc. It can help SMEs to achieve better growth in the digital era. Studies have shown that the digital transformation of enterprises, using digital technology, can reduce the degree of information asymmetry, improve financial stability and reduce adjustment costs, thus accelerating the dynamic adjustment of capital structure[2]. The effective acceleration of the dynamic adjustment of the capital structure helps companies to strengthen the management of capital planning and scheduling. Therefore, enterprises can choose the appropriate way to obtain and utilize capital through digital transformation, thus reducing the behavior of short term loan and long term investment, and promoting the long-term stable development of enterprises.

This paper links the digital transformation of enterprises with short term loans and long term investments, and investigates the inhibiting effect of digital transformation on short term loans and long term investments through the analysis of relevant data; the degree of digital transformation is represented by the number of key words appearing in the

annual reports of enterprises according to the existing studies; the digital transformation of enterprises is used to provide various aspects including enterprises, talents, governments and markets to effectively inhibit short term loans and long term investments. It also provides insights and suggestions for effectively curbing short term loans and long term investments.

## **2. Literature Review and Research Hypothesis**

### **2.1. Research on digital transformation**

Digital transformation plays an important role in promoting the development of the digital economy, which is in fact a digital transformation of enterprises (Zhang Wei, 2022)[3], thus driving themselves on the path of high-quality development (Zhao Chen-Yu et al., 2021)[4]. Some scholars have already studied digital transformation from the perspective of microeconomic effects, and Chen-Yu Zhao et al. (2021) point out that the total factor productivity of enterprises will also be improved after digital transformation [4]. In addition, digital transformation also greatly improves stock liquidity (Wu, F., 2021)[5], factor allocation efficiency (Huang, D. Y., 2022)[6] and promotes corporate ESG performance (Hu, J., 2022)[7].

### **2.2. Research on short term loans and long term investments for enterprises**

Firms' short loans and long investments are mainly influenced by the supply of funds and firms' financing strategies (Sun, Feng'e, 2019)[8], and both insufficient supply of funds and aggressive investment and financing strategies can contribute to short loans and long investments. Sheng Mingquan et al. (2020) studied factors such as firm size as control variables and found that short loans and long investments have a negative impact on total factor productivity[9]. Liu, Hongzhong et al. (2021) also studied factors such as firm size and leverage as control variables and concluded that the higher the uncertainty of economic policies, the lower the degree of short loans and long investments by firms[10]. Ye et al. (2021) classify firms into offensive and defensive types and analyze them from the perspective of information asymmetry theory and agency theory and other perspectives to find that the degree of short loans and long investments will be more severe for offensive firms[11].

### **2.3. Digital transformation has a dampening effect on short term loans and long term investments of enterprises**

Huang Dayu (2022) argues that digital transformation can provide a stronger information base for firms' investment and financing strategies, which helps to obtain more investment projects and broaden financing channels, thus reducing the behavior of firms taking short loans and investing long[6]. Firms that undergo digital transformation tend to invest more in R&D, promote operational efficiency, and do more with less, improve the utilization of resources, and thus attract more investment (Wu, F., 2021)[5], and reduce firms' short-term lending efforts. Deng Bo (2022) argues that digital transformation enhances the ability of firms to invest, thus greatly increasing the effective investment rate[12], and also helps to promote the health of firms' lending and financing strategies.

Digital transformation can prompt enterprises to adjust and improve their investment and financing behaviors and reduce the cost of financing, which is conducive to cost savings and thus investment in development, and also to a certain extent inhibits the behavior of short term loans and long term investments. Based on the above review of the literature, this paper proposes the core research hypothesis.

Hypothesis: Other things being equal, digital transformation is effective in curbing short term lending and long term investment behavior of firms.

## **3. Sample Selection and Research Methodology**

### **3.1. Sample selection and data sources**

In this study, 11 years of financial data of Shanghai and Shenzhen A-share companies from 2011-2021 were selected as the initial sample, and the sample data were processed as follows: 1. individual sample companies with missing data or incomplete master data were removed; 2. data of ST and financial companies were excluded; 3. the data sample was reduced by 1% up and down using stata statistical software; 4. Test to remove obviously unreasonable sample data.

There is no clear calculation standard to measure digital transformation, and this paper intends to find the number of keyword occurrences in the annual reports of enterprises from the official website of Shanghai Stock Exchange to represent the degree of digital transformation based on Wu Fei et al. (2021)[5]. In order to ensure a more comprehensive and complete coverage of the sample data, this data is basically obtained from CSMAR, and Stata and Spss software are used for data correlation analysis.

### **3.2. Variable definition and description**

#### **3.2.1. dependent variable and its calculation - short term loan long term investment (SFLI)**

"Short-term loans for long-term investment" is a long-term investment and financing instrument using short-term loans, and its investment and financing term structure is substantially misaligned. There are various methods to calculate the measurement of short term loans and long term investments, one of which is to choose the short-term debt ratio to short-term assets ratio as a reference indicator for short-term and long-term investments, reflecting the correspondence between the debt repayment structure and the asset structure of the enterprise; the other is to calculate the corresponding data results according to the formula.

Short-term loans and long-term investments (SFLI) = cash cost of investing activities such as acquisition and construction of fixed assets - (increase in long-term borrowings in the period + increase in equity in the period + net cash flow from operating activities + inflow of funds from the sale of fixed assets). This time, the second method is used to measure the level of short term loans and long term investments of enterprises.

#### **3.2.2. Independent variable and its estimation - degree of digital transformation (DCG)**

Digital transformation is a transformation that uses modern technology and communication tools to further touch a company's core business, aiming to create a new business model that changes the high-level way in which companies create value for their customers. Currently, there is no clear formula for calculating digital transformation indicators, and previous studies have mostly used textual indicators

quantitatively, so this paper uses five sub-dimensions of artificial intelligence technology, big data technology, cloud computing technology, blockchain technology, and digital technology usage for textual analysis, so as to construct two levels of digital transformation indicators. Relevant software is used to extract the frequency of key words appearing in the annual reports of enterprises as a measure of the degree of digital transformation.

### 3.2.3. Control variables

Referring to the study by Guanchun Liu (2022)[13], the corresponding variables selected to reflect the financial status of the firm are chosen as follows: firm age (Age), firm size (Size), gearing (Lev), and growth (Growth), and to further eliminate the intervention of external factors, year and industry are introduced as dummy variables. Age is the logarithm of one plus the number of years the firm has been established, size is the logarithm of the firm's total assets, lev is the ratio of total liabilities to total assets, and growth is the annual growth rate of operating income.

### 3.3. Basic model construction

In order to investigate the role relationship between digital transformation and short term loans and long term investments of enterprises, the following model is constructed in this paper.

$$SFLI_{i,t} = \alpha_0 + \alpha_1 DCG_{i,t} + \sum \alpha_n Controls_{i,t} + YEAR_t +$$

In the above model,  $SFLI_{i,t}$  denotes the level of short term lending and long term investment of firm i in year t,  $DCG_{i,t}$  denotes the degree of digital transformation of firm i in year

t,  $Controls_{i,t}$  is the overall control variable,  $YEAR_t$  and  $IND_u$  are the dummy variables for year and industry respectively, and  $\varepsilon_{i,t}$  is the error term.

## 4. Empirical Test and Analysis

### 4.1. Descriptive statistics

The descriptive statistical analysis of the 11292 data collected was performed with the help of Stata software, and the results are shown in Table 1. The control variable enterprise age is the result of adding the number of years of enterprise establishment and repeatedly taking the logarithm, and its value size is between 1.15 and 1.58 with very small standard deviation. The minimum value of enterprise size is 8.67, the maximum value is 11.66, and the mean value is 9.860, with little difference in the data. There is a difference between the maximum and minimum values of the balance sheet ratio, but the standard deviation is not significant. The minimum value of growth is -0.569 less than 0, the maximum value is 2.538, and the mean value is 0.176. The minimum value of the independent variable enterprise digital transformation is 1, and the maximum value is 603, which indicates that the degree of digital transformation varies widely among different enterprises. The dependent variable short loan long investment has a minimum value of -1.684 less than 0, a maximum value of 0.260, and a mean value of -0.178 less than 0. The dependent variable short loan long investment has a minimum value of -1.684 less than 0 and a maximum value of 0.260.

**Table 1.** Descriptive statistics

	N	Mean	Std. Dev.	Min	Max
Age	11292	1.377	0.097	1.15	1.58
Size	11292	9.860	0.628	8.67	11.66
Lev	11292	0.491	0.201	0.068	0.942
Growth	11292	0.176	0.414	-0.569	2.538
SFLI	11292	-0.178	0.265	-1.684	0.260
DCG	11292	17.431	34.712	1	603

### 4.2. Correlation analysis

The degree of correlation between the variables is shown in Table 2. The correlation coefficient between growth and firm size is 0.023 and is significantly correlated at the 0.050

level, and another 8 pairs of variables are significantly correlated at the 0.010 level, which is a good correlation between the variables and allows for further regression analysis to follow.

**Table 2.** Pearson correlation

	Age	Size	Lev	Growth	SFLI	DCG
Age	1					
Size	0.066**	1				
Lev	0.089**	0.401**	1			
Growth	-0.001	0.023*	0.003	1		
SFLI	-0.027**	0.016	0.014	-0.126**	1	
DCG	-0.013	-0.035**	-0.045**	0.041**	-0.017	1

Note: \*\* indicates significant correlation at the 0.010 level and \* indicates significant correlation at the 0.050 level.

### 4.3. Regression analysis

Spss software was used to analyze the data, and the dependent variable was set as the short term loan and long term investment of enterprises, the independent variable was the digital transformation of enterprises, and the control variables were age, enterprise size, gearing, and growth. The

results of data analysis showed that the overall F-value of the model was 39.730 with sig=0.000< 0.001, indicating that the model had good statistical significance.

The linear regression results are shown in Table 3. The coefficient of the independent variable corporate digital transformation is -0.011, which indicates that digital transformation negatively affects corporate short term lending

and long term investment, that is, enhancing the degree of corporate digital transformation can effectively inhibit corporate short term lending and long term investment, thus reducing corporate business risk. Among the control variables, the coefficients of growth and firm age are -0.126 and -0.030, respectively, and the sig values are less than 0.010, indicating that firms with good growth and longer establishment have

lower levels of short loans and long investments. The coefficients of firm size and gearing are 0.017 and 0.010, respectively, indicating that these two control variables positively affect the firms' short term lending and long term investment and will aggravate the firms' behavior of making short term lending and long term investment.

**Table 3.** Table of linear regression coefficients

	Non-standardized coefficient		Standard coefficient	t
	B	Standard Error		
(Constant)	-0.105	0.046		-2.296
DCG	-9.920E-005	0.000	-0.011	-1.176
Growth	-0.085	0.006	-0.126*	-13.490
Age	-0.039	0.012	-0.030*	-3.163
Size	0.008	0.005	0.017	1.642
Lev	0.006	0.006	0.010	0.982

Dependent variable: SFLI

Note: \*\* represents sig less than 0.050, \* represents sig less than 0.010

## 5. Conclusions and Recommendations

### 5.1. Research findings

In the context of the continuous implementation of the new development strategy and the continuous informatization and modernization of all industries, the digital transformation and upgrading of enterprises have both theoretical and practical significance for alleviating the behavior of enterprises' short loans and long investments. This paper conducts a study from the perspective of enterprise digital transformation, and examines whether and how it affects the behavior of enterprises' short loans and long investments by constructing a model.

The research data found that firstly, the degree of digital transformation is inversely correlated with short term lending and long term investment, and digital transformation of enterprises can effectively inhibit short term lending and long term investment behavior of enterprises. This will improve the total factor productivity within the enterprise, increase the utilization rate and reduce the inefficient investment activities, and have more funds for production, thus reducing the need for short term loans and long term investments. Secondly, in the model analysis, enterprise size and gearing are positively correlated with short term loans and long term investments, i.e., the larger the enterprise size, the more it needs to pay attention to its potential risk, large enterprises have more frequent and flexible investment and financing activities, and have certain demand for financial levers and short term loans and long term investments, in order to develop enterprises more permanently, digital transformation is the way to go, and using digitalization to alleviate the short term loans and long term investments dilemma is the choice of large enterprises in reality.

### 5.2. Inspiration and suggestions

(1)enterprises in corporate governance should continue to proactively optimize the relevant rules and regulations, use specialized software to reasonably coordinate planning, allocate funds as rationally as possible, reduce useless investment activities, improve the effective utilization of enterprise resources, and reduce the endogenous causes of short loans and long investments in order to promote high-quality corporate development.

(2)In terms of talent, enterprises need to hire highly skilled personnel, improve the overall quality of employees and expand the scale advantage of internal talent. Some studies show that enterprises with more researchers will have more obvious advantages in digital transformation and factor allocation efficiency improvement, and improve market competitiveness.

(3)the government needs to provide policy support for the digital transformation of enterprises. The government needs to provide some policy support and guidance to guide enterprises to achieve deep integration with digital technology at the level of technological innovation and organizational structure. Policy support should be more differentiated, for different size of enterprises to implement different policies. The scale advantage of large enterprises is beyond the reach of small and micro enterprises, therefore, we must increase the support for small and micro enterprises so that they can successfully realize digital transformation.

(4)optimize the internal and external market environment, the 20th National Congress emphasizes the encouragement of enterprise innovation and development, the global digital trend is deepening, for China's enterprises, it is worth paying attention to the integration of digital technology and traditional enterprise profitability business, the reasonable introduction of digital, to create a good corporate atmosphere. For the external environment it is necessary to guide the flow of talents and capital, and through adequate market coordination and policies, focus on digital transformation and corporate transformation in terms of talent training and patent protection to form an external environment suitable for transformation and further enhance the intrinsic value of enterprises.

## Acknowledgment

This work is supported by Anhui University of Finance and Economics Undergraduate Research innovation fund project fund, Project number: XSKY22038ZD.

## References

- [1] H.Y. Liu, S.J. Guo: Short loans and long investments, bank-enterprise linkages and corporate debt default risk[J]. Finance and Economics,2022(10):69-78.

- [2] Y.Q. Zhang ,T.H. Luan: Digital transformation and dynamic adjustment of capital structure of enterprises in the digital economy [J/OL]. North China Finance,2022(10):69-78 [2022-11-09].
- [3] W. Zhang: Analysis of key factors and guarantees for digital transformation of enterprises--a case study of companies listed on the science and technology innovation board[J]. People's Forum - Academic Frontier,2022(18):70-78.
- [4] C.Y. Zhao, W.C. Wang,X.S. Li: How digital transformation affects total factor productivity of enterprises[J]. Finance and Trade Economics,2021,42(07):114-129.
- [5] Wu Fei, Hu Huizhi, Lin Huiyan, Ren Xiaoyi. Corporate digital transformation and capital market performance-empirical evidence from stock liquidity[J]. Management World, 2021, 37(07):130-144+10.
- [6] Huang, Dayu, Xie, Xuebao, Zou, Mengting. Has digital transformation improved the factor allocation efficiency of firms? --Empirical evidence from textual analysis of Chinese listed firms' annual reports[J]. Finance and Economics, 2022(06):3-11.
- [7] Hu Jie, Han Yiming, Zhong Yong. How corporate digital transformation affects corporate ESG performance - evidence from Chinese listed companies[J/OL]. Industrial Economics Review:1-20 [2022-11-09].
- [8] Sun, Feng'e. Are short loans and long investments a forced behavior of firms? --Based on the perspective of managerial overconfidence[J]. Finance and Economics Series, 2019 (06): 73-82.
- [9] Sheng, Mingquan, Ren, Qiao, Bao, Qun. Study on the relationship between short term loans and long term investment and total factor productivity[J]. Asia-Pacific Economy, 2020 (01): 116-126+152.
- [10] Liu Hongzhong,Zhao Jiao Yang. Economic policy uncertainty, financing risk and corporate short term lending and long term investment[J]. Shanghai Finance,2021(01):12-23.
- [11] Yeh, C. W., Zhang, X. M., Hu, C. W.. Why do firms lend short and invest long? --An explanation based on a corporate strategy perspective [J/OL]. Nankai Management Review:1-30 [2022-11-09].
- [12] Deng Bo. A study on the impact of digital transformation on business investment [J/OL]. Price Theory and Practice:1-4 [2022-11-09].
- [13] Liu Guanchun, Ye Yongwei. Economic policy uncertainty and real enterprises' short loans and long investments[J]. Statistical Research,2022,39(03):69-82.