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Does Digital Reform Promote the Development of the Real Economy: Mechanism and Evidence

-- Based on the Financial Perspective of Shanghai Stock Exchange Corporation

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Abstract: The digital economy based on the new generation of information technology has increasingly become an important driving force to promote economic development. However, the research on relevant digital economy theories lags behind, making it difficult to accurately explain the new economic phenomenon and more effectively guide the high-quality economic development practice in the new development stage. This paper focuses on the impact of digital technology change on the development of relevant basic theories of economics. Based on the panel data of Shanghai Stock Exchange Corporation from 2016 to 2020, it comprehensively analyzes the impact of the degree of digital division of labor and the intensity of digital transformation on the growth of enterprises. From this small Perspective, it broadens to the level of China's real economy, and analyzes how the digital reform of enterprises brought by digital policies affects the real economy. This paper finds that, according to the existing data, the degree of digital division of labor and the intensity of digital transformation play a role in promoting economic development. Moreover, with the promotion of the national digital strategy, the economic dividends brought by the policy to enterprises each year increase. The following suggestions are given: enterprises should pay attention to digital reform and improve their production efficiency; At the national level, we should continue to deepen the reform of the digital economy system and guide enterprises to develop healthily.

Keywords: Digital economy; Real economy; Listed company.

1. Introduction

In 2016, the scale of China's digital economy was 22.4 trillion yuan, and in 2019 it reached 35.8 trillion yuan, accounting for 36.2% of GDP. According to comparable standards, the year-on-year nominal growth rate was 15.6%, far higher than the GDP growth rate. What is the digital economy? This article believes that the digital economy is not simply a combination of enterprises and the Internet, but a new economic development concept based on intelligent manufacturing, using the Internet as a channel, big data analysis as a sales reference, integrating digital informatization into the process of enterprise development, and continuously promoting the upgrading of self manufacturing. As a huge developing country, the real economy is the foundation of China's economy, and the manufacturing industry contributes the most to the real economy. In recent years, how to promote the digital transformation of the manufacturing industry has become a hot topic, because the digital transformation of the manufacturing industry not only means accurate production direction, intensive cost of raw materials, upgrading and iteration of production technology, but also has a significant improvement effect on the environmental ecology, That is to say, such a transformation can not only promote positive internal development, but also have a positive incentive effect on external factors.

The report of the 19th National Congress of the Communist Party of China on "Promoting China's Industry to Move towards the Middle and High End of the Global Value Chain" highlights the strategic urgency of how to achieve the upgrading of the manufacturing industry. For a long time, the model of China's manufacturing industry embedding the global value chain from the low end of the value chain to participate in global division of labor has not only failed to achieve the high-end climb of the value chain, but also has the risk of falling into the "low-end lock-in" trap of developed countries. To break this dilemma, we must break away from the logic of "embedded upgrade" thinking. Obviously, whether the existing global value chain division of labor system can be reconstructed is the key to solving this problem. The rapid rise of the digital economy has triggered the restructuring of the manufacturing value chain, which provides a new opportunity to solve this problem and will also become a new topic of academic research.

The improvement of the degree of digital transformation of enterprises can improve information asymmetry and strengthen positive market expectations, promote the improvement of R&D investment and innovation output performance, and enhance enterprise value and financial stability. All of these help to enhance the liquidity level of enterprise stocks. Under the favorable development of financial technology and digital finance, the digital transformation of enterprises has a more significant effect on improving stock liquidity. (Wu Fei, 2021) At the macro level, the digital economy can promote economic growth through three paths: new input factors, new resource allocation efficiency, and new total factor productivity[1]. The digital economy also has a self growth model similar to that proposed by Smith; The rapid development of the digital economy can provide better matching mechanisms and innovation incentives for the construction of China's modern economic system. (Jing Wenjun, 2019) The Internet transformation of enterprises has a significant improvement effect on the innovation ability of Chinese enterprises, and low productivity enterprises and small and medium-sized enterprises can benefit from it[2]; Internetization of enterprises is defined as the process of bidirectional information exchange between enterprises and the outside world through the Internet, in order to reduce the cost of internal communication and information exchange between enterprises and the outside world, improve communication efficiency, and learn external knowledge and experience. (Shen Guobing, Yuan Zhengyu, 2020) The Internet has significantly promoted enterprise exports, and its impact on enterprise exports is greater than domestic sales, which will increase the intensity of enterprise exports; The results of fixed effect estimation indicate that using a web page for a company will increase its export volume by 40%, and using email will increase its export volume by 37%[3]. The Internet has significantly promoted enterprise exports, and its impact on enterprise exports is greater than domestic sales, which will increase the intensity of enterprise exports; The results of fixed effect estimation indicate that using a web page for a company will increase its export volume by 40%, and using email will increase its export volume by 37%[4]. (Li Bing and Li Rou, 2017)

The advantages and disadvantages of digitalization for enterprises are approaching perfection in theory. There are few empirical analysis papers on the relationship between enterprise development and digitalization process in the literature related to digitalization and enterprises. This article aims to examine whether the driving force of digitalization on the development of the real economy is significant through empirical research on Chinese listed companies.

2. Literature Review

Humphrey and Schmitz (2002) first explored the issue of value chain upgrading paths in developing countries. The academic community believes that there are two main paths: one is to climb or "embedded" upgrade within the existing value chain system. Developing countries can leverage their comparative advantage in factor costs (Frederick and Gereffi, 2011) to embed and upgrade from the low end of the global value chain (Oliver et al., 2011), but they will be hindered by two advanced stages of functional upgrading and chain upgrading (Liu Shouying and Yang Jidong, 2019), falling into the "low end lock-in" trap (Mc William et al., 2019). The second is to break through the existing value chain division of labor system and upgrade, also known as "restructuring" upgrading. The restructuring of the global value chain has led to a change in the comparative advantage of the previously formed value chain (Chen Xu et al., 2019), and the redistribution of value among industrial modules (Li Chunfa et al., 2020)[5], which is conducive to the "structural occupation" and leapfrog upgrading of the industrial chain in latecomer industrial countries (Gao Jing et al., 2019). It is considered an important way for developing countries' manufacturing industries to solve the problem of "low-end locking" in the value chain (Panand et al., 2013).

In 1994, economist Tapscott first proposed the concept of "digital economy", and the relationship between the development of the digital economy and the restructuring of the manufacturing value chain began to receive attention (Tapscott, 1996; Bolwijnet al, 2018). Existing literature suggests that the digital economy mainly reconstructs the manufacturing value chain from the following aspects: firstly, the new technological revolution in the digital economy era has led to changes in the characteristics and endowments of production factors (Pei Changhong, 2018)[6], and numbers have become a key production factor (Sturgeon, 2021), which will profoundly affect the division of labor and governance pattern in the value chain (Wang Yonglong et al., 2020)[7]; Secondly, the new generation of information technology has overturned traditional production technologies (Jiang Xiaojuan and Meng Lijun, 2021), reshaping the value creation methods on the industrial chain by breaking industry boundaries and integrating innovation (Ma Dan and He Yaxing, 2020); Thirdly, driven by the digital economy, the boundaries of industrial chain division of labor tend to be blurred, organizational forms tend to be flattened, and the gap in value distribution between different division of labor links is narrowing (Shao Chaopai and Su Danni, 2019), which will promote the transformation of value distribution methods on the industrial chain (Liu Pingfeng and Zhang Wang, 2020)[8].

The digital transformation has significantly improved the economic benefits of physical enterprises, and the results of using instrumental variable method and lag regression method are still robust. The specific implementation path is to promote the economic benefits of digital transformation in physical enterprises by reducing costs, improving asset utilization efficiency, and enhancing innovation. (He Fan, 2019) From a theoretical perspective, the digital economy integrates innovation achievements and sources into the real economy, using new generation technologies to promote comprehensive transformation of traditional industries[9]. On the one hand, it promotes the evolution of the division of labor in the real economy, and on the other hand, it promotes the improvement of the total factor production rate of the real economy, thereby supporting the high-quality development of the real economy. At present, the scale of China's digital economy continues to expand and the development speed continues to improve. However, there are still problems such as weak digital awareness, fragmented data, insufficient supply of transformation services, incomplete credit evaluation systems, insufficient talent supply, and insufficient management capabilities, which restrict the high-quality development of the digital economy to support the real economy. Therefore, starting from the driving mechanism, operating mechanism, guarantee mechanism, and policy mechanism that support the digital economy, we should promote the high-quality development of China's real economy through paths such as improving digital infrastructure construction, strengthening the supply of digital core technology, strengthening the supply of digital governance systems, improving credit evaluation systems, and strengthening digital literacy education. (Ren Baoping, 2022)

The digital economy relies on digital platforms to support the high-quality development of the real economy. The digital economy promotes the evolution of division of labor and specialization in the real economy. After the deepening of division of labor, economic individuals need platforms for transactions. The emergence and development of platforms further reduce transaction costs and promote the deepening of division of labor. A platform is a business model that creates value by integrating different user groups into the same network. The emergence of platforms has a long history and is not unique to the digital economy. In the traditional economy, shopping malls and newspapers belong to the category of platforms, but traditional platforms are limited by cost, time, and space, making it difficult to connect a large number of producers and consumers. Digital platforms have achieved zero cost entry for market participants, and as the number of entries increases, the value created by the platform continues to increase. The development of the digital economy has driven the birth of digital platforms, significantly reducing market transaction costs, improving the spatial flow efficiency of factors and products, optimizing the matching degree of production factors, and thus better meeting consumer demand and supporting high-quality development of the real economy. The new digital platform born under the digital economy supports the high-quality development of the real economy with new business and production models. According to the different stages of social production, platform organizations can be divided into two categories. One is product trading platforms, whose essential function is to provide online intermediary services for product and service transactions. Taobao is a typical representative of this platform, which gathers suppliers and consumers from all over the country on the same platform, breaks through geographical barriers, saves transaction costs, and promotes the evolution of specialized division of labor, meets the personalized needs of consumers, and supports high-quality development of the real economy. The second is the production service platform, which plays a role in application scenarios such as equipment management services, production process control, and resource allocation optimization. Industrial internet platforms represented by Haier Kaos COSMOPlat, Tree Root Interconnection Root Cloud, etc. can provide big data analysis services for large enterprises, help small and medium-sized enterprises complete digital transformation at lower costs, optimize enterprise resource allocation, improve production efficiency, and promote high-quality development of the real economy.

In summary, regarding the impact of the digital economy on value chain reconstruction, we can summarize several major advantages of the digital economy: reduced product costs, clear demand objectives, and accelerated upgrade iterations. At the level of product cost reduction, we divide product costs into two aspects: production costs and transaction costs. In the traditional economic system, the division of labor between industrial chains is more clear, but this also leads to the disadvantage of low product synthesis matching. Due to the different productivity of different parts of the product, coupled with the lack of timely information communication, the productivity of parts is not matched, reflecting the barrel effect in production. The excess productivity is not fully reflected, and instead, it has ushered in a phased cost increase, In the current era of frequent data exchange, digital management can effectively solve this problem. In terms of transaction costs, the Internet provides a more convenient platform, making distribution channels simpler and faster, eliminating cumbersome warehousing and sales expenses. At the level of clear demand goals, as big data has already summarized the products that consumers have consumed in the past, a large amount of consumption data can provide manufacturers with a clear sales target. Li Chunfa (2020) believes that this has recreated the supply and demand relationship at the end of the industrial chain, no longer selling what is produced, but producing what is needed based on consumer demand. At the level of accelerating price increase iteration, the most expressive industry is the chip semiconductor industry. Just a few years ago, the 14nm chip production process was just introduced and won the industry's attention. In just a few years, the 5nm chip production technology has become mature and will soon be put into production on NVIDIA's RTx4090 graphics card.

In the process of value chain reconstruction driven by the digital economy, Li Chunfa (2020) believes that this process is mainly divided into four stages, namely the foundation period, development period, maturity period, and transformation period. In the basic period, digital knowledge and information have become key production factors, and digital infrastructure is facing upgrading. At this time, industries such as industrial internet, 5G, cloud computing, and the Internet of Things are developing rapidly. During the development period, the new technologies brought about by digitalization continue to impact traditional industries, change the original resource allocation methods, and actively transform the industrial chain by integrating digitalization. At this time, information digitization, new business models, and industrial chain organizational forms undergo changes. In the mature period, industrial internet platforms have emerged, and big data has driven demand changes to force production. Enterprise production has also become targeted, and new manufacturing models have emerged. Service oriented manufacturing, network collaborative manufacturing, and large-scale personalized customization have emerged one after another. Finally, during the economic transformation period of the reconstruction process, advanced manufacturing technology and digital new technologies are integrated and applied, promoting the transformation from automation to intelligence.

3. Data Selection and Model Establishment:

3.1. Data selection

Firstly, consider the net asset growth rate as the dependent variable, as it represents the development speed and expansion scale of the enterprise. Compared to total operating revenue, the net asset growth rate is a more reasonable variable. Due to the different industries in which the enterprise operates, there is a significant difference in revenue scale and profit margin. In this case, if total revenue is used as a variable, the variance is too large.

In terms of core explanatory variables, the quantitative measurement of enterprise digital transformation is a cutting-edge issue in both academia and practical departments. From a theoretical perspective, although data has been widely accepted as an important economic "new energy" in the new era and stage, the digital transformation of enterprises is not simply the digitization of enterprise data, but rather the use of cutting-edge digital technology and hardware systems to promote the digitization of enterprise production materials and processes, thereby achieving the important goal of improving quality and efficiency. In the process of enterprise digital transformation, firstly, enterprises will focus on relying on "digital technology driven" to transform and enhance the digitalization level of their existing technology systems and production systems. This transformation depends on the layout and development of key core technologies. (Wu Fei, 2021) The driving force of digitization mainly considers two aspects, one is the degree of digital division of labor, and the other is the intensity of digital transformation. Detailed digital division of labor can make the production of enterprises more organized, facilitate the integration of existing resources, and enable enterprises to maximize their own advantages. The intensity of digital transformation measures the degree of enterprise transformation, and the speed of transformation varies for each enterprise. Ultimately, due to different industries, market sizes, and business environments, fast digital transformation means faster advancement of automation and intelligence, which are closely related to enterprise production. Their advancement can enable enterprises to have faster production speed and quality. The degree of digital division of labor and the intensity of digital transformation are two different dimensions. The former focuses more on resource allocation of enterprises, while the latter focuses more on production efficiency of enterprises.

At the same time, considering the actual problems of enterprise production and operation, this article cites financial risk (a comprehensive indicator that includes debt ratio and exchange rate), profitability (a comprehensive indicator that includes return on equity and return on equity), and operational capacity (a comprehensive indicator that includes investment income and asset turnover) as explanatory variables for auxiliary regression. Financial risk is a comprehensive indicator of a company's debt ratio, cash flow, exchange rate, and other issues; Profitability is an indicator that measures the profitability of a company; Operational capability is an indicator that measures a company's capital turnover ability and business scale expansion ability.

Table 1. Main variables and their explanations

Variable	Obs	Mean	Std.Dev	Min	Max
net asset growth rate	5,400	0.1958213	0.2564885	0.003624	11.95275
The degree of digital division of labor	5,400	4.367601	2.467269	0.035472	27.19146
the intensity of digital transformation	5,400	0.6931372	0.7447467	0.002076	6.47864
Financial risk	5,400	1.278999	0.9558746	0.00228	4.91074
Profitability	5,400	3.892033	2.33055	0.000353	79.69371
Operational capability	5,400	0.6806058	0.7853632	0.000702	34.83499

Data source: 2016-2020 Finance of Chinese Listed Companies

This article uses data from listed companies in the Chinese securities market from 2016 to 2020 (excluding some companies whose main business is agriculture) to organize comprehensive analysis indicators such as net asset growth rate, degree of digital division of labor, intensity of digital transformation, financial risk, profitability, and operational ability. The net asset growth rate of the enterprise is used as the explanatory variable, and other variables are used as the explanatory variables in the quantitative elastic regression model, Mainly observe whether the degree of digital division of labor and the intensity of digital transformation have a significant impact on the net asset growth rate.

3.2. Model construction:

$$\text{GRONA} = A * \text{DOD}\partial^2 * \text{TI}\partial^3 * \text{FR}\partial^4 * \text{AOE}\partial^5 * \text{AOO}\partial^6 + \varepsilon \quad (1)$$

GRONA is the net asset growth rate, A is the adjustment coefficient, DOD is the degree of digital division of labor, TI is the intensity of digital transformation, FR is financial risk, AOE is profitability, and AOO is operational capability. Explanation: The FR coefficient is the company's asset liability ratio multiplied by the annual average exchange rate at that time, the AOE coefficient is the return on net assets multiplied by the return on net assets/100, and the AOO coefficient is the investment return multiplied by the asset turnover rate/100.

Establishing a conjecture:

The growth rate of a company's net assets is related to the degree of digital division of labor, the intensity of digital transformation, financial risk, profitability, and operational ability of the enterprise. Establish an elastic model:

1.The net asset growth rate of a company is related to the degree of digital division of labor, intensity of digital transformation, financial risk, profitability, and operational ability of the enterprise, and an elastic model is established

$$ln_{GRONA} = \partial_1 + \partial_2 ln_{DOD} + \partial_3 ln_{TI} + \partial_4 ln_{FR} + \partial_5 ln_{AOE} + \partial_6 ln_{AOO} + \varepsilon \quad (2)$$

2.The net asset growth rate of a company is related to its degree of digital division of labor, intensity of digital transformation, financial risk, profitability, and operational ability. Moreover, with the deepening of government guidance on digital reform, the company receives more and more policy dividends every year, enabling it to achieve faster and more rapid development. Establish an annualized effect model:

$$ln_{GRONA} = \partial_1 + \partial_2 ln_{DOD} + \partial_3 ln_{TI} + \partial_4 ln_{FR} + \partial_5 ln_{AOE} + \partial_6 ln_{AOO} + i * YEAR + \varepsilon \quad (3)$$

4. Analysis and Testing of Empirical Results

4.1. Benchmark regression

Table 2. Benchmark regression without annualization effect

logGRONA	Coef.	Std. Err .	t	P>|t|
logDOD	0.1633119	0.021798	7.49	0.000***
logTI	0.0977014	0.0075552	12.93	0.000***
logFR	0.0753016	0.0094153	8.00	0.000***
logAOE	0.4982801	0.02454	20.3	0.000***
logAOO	0.1020473	0.0165305	6.17	0.000***
cons	-2.495622	0. 0368638	-67.7	0.000***
R-sq	0.8846			

Note: ***, **, and * represent passing the test at the significance levels of 1%, 5%, and 10% respectively.

From Table 2, we can see that the degree of digital division of labor, the intensity of digital transformation, financial risk, profitability, and operational capability have significant explanatory effects on the dependent variables. The goodness of fit of the overall model is 0.88.

When the degree of digital division of labor is used as the explanatory variable, the elasticity is 0.16, and the p-value test is qualified. In the digitalization process of enterprises, when the division of labor is clearer, production resources are indeed more reasonably allocated, thereby promoting the production of the enterprise. The elasticity is 0.16, indicating that the degree of digital division of labor has contributed 16% to the growth of the enterprise. In the process of enterprise development, digital division of labor has brought convenience to production, transportation, and sales, enabling the enterprise to have a better development environment and achieve faster and more stable development and growth.

When the intensity of digital transformation is used as an explanatory variable, the elasticity is 0.10, and the p-value test is qualified. When the transformation of enterprises becomes more active, automation and intelligence bring technological innovation to the enterprise, changing the original production methods, creating new production methods, improving the production efficiency of the enterprise, and increasing the net asset growth rate. If two manufacturers producing the same product have a complete digital production system, while the other only introduces some aspects of digital production, when the two enterprises are in a competitive state, the manufacturer with a complete production system has cheaper production costs and stronger competitiveness in market sales. Whether consumers choose products through price comparison effect, Manufacturers still rely on the standardization of products to sell their products. Manufacturers with a complete digital production system will have more favorable self conditions and market conditions, sell more products, and obtain more profits. They can use excess profits to improve their production system, improve their management system, and increase the net asset growth rate.

When financial risk is used as an explanatory variable, the elasticity is 0.08, and the p-value test is qualified. The financial risk here is a comprehensive indicator that takes into account the combination of corporate debt ratio and exchange rate. A positive coefficient explains to some extent that having a certain debt ratio can make a company's production more flexible. Debt is not necessarily a bad thing for a company, and appropriate debt can make a company more productive in a short period of time. So, to a certain extent, the significant positive impact of financial risk on net asset growth rate can be allowed by facts, and there is evidence in reality.

When profitability is used as the explanatory variable, the elasticity is 0.50, and the p-value test is qualified. Profitability is a comprehensive indicator that takes into account parameters such as return on equity and return on equity. A contribution rate of 0.50 indicates that profitability is the foundation of a company. When a company has sufficient profitability, it will have surplus money to expand production. After the expansion project is put into operation, the company's profitability is further enriched, forming a virtuous cycle and continuously contributing to the improvement of the company's net asset growth rate. At the same time, we can see that a contribution rate of 0.50 is the highest contribution rate in the table. The growth of a company must be based on profitability, which is very practical.

When the operating capacity is used as the explanatory variable, the elasticity is 0.10, and the p-value test is qualified. Operational capability is a comprehensive indicator that combines investment returns with asset turnover. When a company can reinvest through excess net profit, it can eliminate outdated production capacity, introduce equipment, high-tech talents, and higher quality production lines, which has a significant positive impact on the company's subsequent development. At the same time, asset turnover rate is also very important for the development of enterprises. The higher the asset turnover rate, the more reasonable the use of funds by enterprises, because under the same financial conditions, enterprises use it to make more investment and production.

Table 3. Benchmark regression with annualized effects

logGRONA	Coef.	Std. Err .	t	P>|t|
logDOD	-0.0250065	0.0241811	-1.03	0.301
logTI	0.052334	0.0077118	6.79	0.000***
logFR	0.0301938	0.0094495	3.20	0.001***
logAOE	-0.0525702	0.0036586	-14.37	0.000***
logAOO	0.0120931	0.0167716	0.72	0.471
YEAR				
2017	1.388772	0.0480286	28.92	0.000***
2018	1.749983	0.0620736	28.19	0.000***
2019	2.074067	0.0720947	28.77	0.000***
2020	2.350437	0.0807349	29.11	0.000***
cons	-3.129435	0.0495119	-63.21	0.000***
R-sq	0.8942			

Note: ***, **, and * represent passing the test at the significance levels of 1%, 5%, and 10% respectively.

From Table 3, it can be seen that after taking into account the annualized effect, the R-squared is as high as 0.89. Compared with the benchmark regression without annualized effect, the R-squared is better, and the fitting of the entire model is more fitting. Although the p-values of various values were more robust in the benchmark regression without annualized effects before, we can still see the existence of annualized effects in the new model. Compared to the annualized effect of base value 1 in 2016, the annualized effect in 2017 was 1.39. The annualized effect in 2018 is 1.74, the annualized effect in 2019 is 2.07, the annualized effect in 2020 is 2.35, and the p-value test is qualified. Without excluding the possibility that the annualized effect may conflict with the degree of digital division of labor and profitability, we can still see that with the development of the digital era, the government has formulated more and more dividend policies to promote the digital development of enterprises, Such policies have also truly brought policy dividends to enterprises, thereby promoting their development. We can see that such policy dividends have been increasing year by year from 2016 to 2020. On the one hand, the government is fully aware of the reform dividends that digitalization brings to enterprises. This reform dividend also promotes the tax revenue that enterprises bring to the government, which in turn encourages the government to continue formulating incentive policies for digital transformation; On the other hand, enterprises have also seen the convenience brought by digital transformation, which enables them to better produce and operate, accelerates their digital development, liberates some human capital, and allows enterprises to shift more costs from human resources to technological innovation or management upgrading.

4.2. Multicollinearity test

Table 4. Multiple collinearity test for explanatory variables

Variable	VIF	1/VIF
The degree of digital division of labor	6.29	0.158932
Profitability	4.40	0.227224
Financial risk	3.63	0.275835
the intensity of digital transformation	2.31	0.432342
Operational capability	1.27	0.784563
Mean VIF	3.68	

Due to the indirect impact of the advancement of digitalization, as the division of labor becomes clearer and the intensity of transformation increases, the application of automation and intelligence in enterprises becomes more profound. The productivity of enterprises exceeds that of other industry peers, and profits may increase significantly, thereby affecting cash flow and operational conditions. Therefore, it is necessary to conduct multicollinearity tests on the explanatory variables of the digital process and profitability, financial risk, and operational capabilities.

As shown in Table 4, the VIF values before each data item are very low, indicating a low possibility of multicollinearity between the data. The explanation for this may be that during the operation of an enterprise, its financial risk, profitability, and operational capabilities also have a certain correlation with its industry. This connection weakens the impact of the digital process on its indicators, weakening its multicollinearity.

4.3. Robust Test

Considering the stability of the overall model, this article conducts a stability test on the model. The category of stability test is variable substitution. The degree of digital division of labor (DOD) and digital transformation intensity (TI) are replaced by the investment rate of digital transformation projects (DID). If a company invests in digital transformation projects within a certain period of time, it will inevitably change its digital process, including the degree of digital division of labor and digital transformation intensity.

Establish a stability test model as follows, replacing logDOD and logTI with logDID:

Stability test for benchmark regression without annualization effect:

$$ln_{GRONA} = \partial_1 + \partial_7 ln_{DID} + \partial_4 ln_{FR} + \partial_5 ln_{AOE} + \partial_6 ln_{AOO} + \varepsilon \quad (4)$$

Table 5. Stability test (substitution variable method) without annualization effect

logGRONA	Coef.	Std. Err .	t	P>|t|
logDID	0.0911717	0.0083192	10.96	0.000***
logFR	0.0771229	0.0097979	7.87	0.000***
logAOE	0.7011401	0.0176919	39.63	0.000***
logAOO	0.1552305	0.0160733	9.66	0.000***
cons	-2.787142	0.0316929	-87.94	0.000***
R-sq	0.8817			

Note: ***, **, and * represent passing the test at the significance levels of 1%, 5%, and 10% respectively.

From Table 5, we can see that the goodness of fit of the stability test model is 0.88, indicating a very high overall fit and passing the stability test.

The study found that the P-value test for the investment rate (DID) of digital transformation projects, which is used to replace the degree of digital division of labor (DOD) and the intensity of digital transformation (TI), passed, with a t-value of 10.96 and an elasticity coefficient of 0.09. On the one hand, this test model verifies that digital reform has a positive promoting effect on the growth and development of enterprises. From the perspective of investment rate of digital transformation projects, the more investment a company makes in digital transformation projects, the better its subsequent development level; On the other hand, due to the substitution of variables, although the overall model passed the test, in the stability test model, the contribution coefficient of profitability reached 0.70, and the elasticity coefficient is not equal to the sum of the previous two. To some extent, the problems in digital transformation are related to the profitability of the enterprise.

Stability test for benchmark regression with annualized effects:

$$ln_{GRONA} = \partial_1 + \partial_7 ln_{DID} + \partial_4 ln_{FR} + \partial_5 ln_{AOE} + \partial_6 ln_{AOO} + i * YEAR + \varepsilon \quad (5)$$

Table 6. Stability test (replacement variable method) with annualized effect

logGRONA	Coef.	Std. Err .	t	P>|t|
logDID	0.0583113	0.0081764	7.13	0.000***
logFR	0.0324158	0.0097129	3.34	0.001***
logAOE	0.1247283	0.0340091	3.67	0.000***
logAOO	0.0142464	0.017057	0.84	0.404
YEAR				
2017	1.141014	0.0558699	20.42	0.000***
2018	1.390579	0.0714899	19.45	0.000***
2019	1.615086	0.0826097	19.55	0.000***
2020	1.794525	0.0913232	19.65	0.000***
cons	-3.360588	0.0419137	-80.18	0.000***
R-sq	0.8904			

Note: ***, **, and * represent passing the test at the significance levels of 1%, 5%, and 10% respectively.

From Table 6, we can see that the goodness of fit of the stability test model is 0.89, indicating a very high overall fit and passing the stability test.

After introducing variables into the benchmark regression with annualized effects, examine whether the annualized effect still exists. Research has found that the annualization effect still exists, indicating that the digital reform policies formulated by the government have promoted the development of the real economy. The annualized effects from 2017 to 2020 were 1.14, 1.39, 1.61, and 1.79, respectively, and all p-value tests passed. The trend of the aging effect in Table 3 is the same as before, indicating that the policy dividend brought by digital policies to enterprises every year is accelerating.

5. Conclusion and Inspiration

5.1. Conclusion

The digital economy is the trend of the times, an important driving force for the future development of the country, and a key focus of attention in the 19th National Congress Economic Report. China attaches great importance to the digitalization of enterprise development, thereby promoting the automation and intelligence of enterprise operations, and strengthening the innovation ability and profitability of enterprises. In some industries where science and technology are stuck, such as chips and semiconductors, promoting the integration of enterprises and digitization is a necessary path. In the process of digitalization, enterprises can improve their value chain in two ways. The first is to embed and upgrade from the low end, which may be affected by the existing high-end value chain and fall into the "low end trap". The second is to break the original value chain system and carry out restructuring and upgrading.

This article first reviews the theory of digital start-up value chain reconstruction, and then uses multiple elastic regression models to empirically study the impact of digital processes on enterprise development based on data from Chinese listed companies from 2016 to 2020. The following conclusions are drawn:

1.The degree of digital division of labor in enterprises has a significant positive impact on the net asset growth rate. The degree of digital division of labor is related to the resource utilization efficiency of enterprises. When enterprises focus on digital division of labor and apply it to actual company operations and production, the development efficiency of the company will significantly increase. So, in future operations, enterprises should focus on digital division of labor and timely communication of internal information

2.The intensity of digital transformation in enterprises has a significant positive impact on the growth rate of net assets. When a company actively engages in digital transformation, it chooses the future development trend. Through continuous deepening of digitization, objective profits have been brought to enterprises, promoting the improvement of net asset growth rate, and enterprises have indeed achieved rapid development.

3. The initial results of digital reform are inseparable from the guidance and support of the government. In recent years, China has vigorously implemented digital reform policies, integrating digitalization into the production, manufacturing, and sales of the real economy, simplifying the tedious division of labor for enterprises, and making their development more orderly. This article demonstrates that the digitization process has an annualized effect and continues to expand, with policies more inclined towards digital economic reform.

In summary, the deep integration of digital technology and manufacturing is the breakthrough point for China's economic transformation and upgrading. From consumer internet dominance to industrial internet dominance, digitalization has a significant driving effect on the production and development of enterprises. The policies formulated by the government to strengthen the digitalization process are meaningful and correct.

5.2. Policy implications

This article has the following policy implications. Firstly, China should actively comply with the trend of rapid development of digital technology, fully seize the opportunities for enterprise digital transformation, vigorously tilt policies towards enterprises, encourage deep integration of digital technology with enterprises in terms of products and organizational structure, and assist in high-quality development of enterprises. The digital development of enterprises should follow the principle of differentiation, develop distinctive digital paths according to the special circumstances of different enterprises, guide the mutual adaptation of technological innovation and digital transformation needs of enterprises through "learning by doing", and minimize enterprise risks as much as possible in the process of integrated innovation. Secondly, due to the market monopoly situation between Alibaba and Tencent companies, the market must establish and improve a more comprehensive market supervision system. On the one hand, it is necessary to promote large and highly digitized companies to stop monopolistic behavior and guide the correct market order; On the other hand, for some growing small and medium-sized enterprises, strengthen their awareness of compliance with the law. Thirdly, China is in the acceleration stage of digital development. In order to enhance the international perspective and competitiveness of Chinese companies, the country should provide a good external environment for the digital development of enterprises, promote the precise integration of digital processes with enterprises, better leverage the leading and driving role of digitalization in the real economy, promote the diversified innovation ecological scene of enterprises, and improve the efficiency of digital policies in identifying high-quality enterprises, Assist enterprises in digital transformation and achieve better performance in the international market.

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