

Research on the Investment Efficiency of Enterprises with the Combination of Industry and Finance

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Abstract

With the gradual relaxation of Chinese financial supervision and learning from foreign experiences, many companies have begun to explore the integration of industry and finance as a new development model. Among the world's top 500 companies, more than 80% of them engaged in Industry-finance integration. This article uses inductive analysis and empirical analysis to research and analyze the investment efficiency of enterprises with the integration of industry and finance, and finally conclude that the integration of industry and finance will improve the investment efficiency of enterprises.

Keywords

Industry-finance Integration; Investment Efficiency; Internal Governance.

1. Introduction

This article mainly studied the investment efficiency of listed companies with the integration of industry and finance. At present, a large number of domestic and foreign documents mainly focus on the following three aspects: the motivation of the integration of industry and finance; the economic effect of the integration of industry and finance; and the relationship with corporate innovation. Carlo (2019) believes that enterprises owning banks will help banks obtain more favorable information about enterprises, thereby reducing the agency costs and debt costs of enterprises [1]. Zhang Lin (2017) found through empirical research that state-owned enterprises' equity participation in financial institutions is a diversified investment behavior, just to obtain financing convenience, while private enterprises' equity participation in financial institutions is to ease corporate financing constraints [2]. In the research of Han Dan and Wang Lei (2016), they did not find that the combination of industry and finance stimulated the excessive investment of enterprises. The impact of the integration of industry and finance on the investment efficiency of enterprises is mainly to improve the lack of investment, and ultimately improve the investment efficiency of enterprises [3]. As a result, the research hypothesis of this article is put forward: Under the same conditions, the integration of industry and finance will improve the investment efficiency of enterprises, and internal governance has a positive regulatory effect on the relationship between Industry-finance integration and investment efficiency.

2. Research Method

- (1) Inductive analysis method. By consulting a large number of documents, summarizing and analyzing the various documents reviewed, and extracting the theoretical basis of this article.
- (2) Empirical analysis method. The sample data comes from my country's A-share listed companies from 2015 to 2020, using EXCEL software to sort out the sample data, construct a relevant regression model, and use regression analysis and sample mean t-test methods for empirical analysis.

3. Research Design

Industry-finance Integration (IIF) Although both listed financial institutions and non-listed financial institutions are within the consideration of companies choosing to participate in financial institutions, listed financial institutions are generally large in scale, with high information transparency, decentralized equity, strict government supervision, and shareholding. To a certain extent, financial institutions can help companies avoid risks or stabilize returns, but they have limited impact on business and investment decisions (Liu Jing, 2019). Therefore, this article refers to the practice of Wang Chaoen (2016), Han Min (2017) and other scholars, and takes equity participation in non-listed financial institutions as 1, and non-participation in non-listed financial institutions as 0. In order to avoid missing data in a single database, this article integrates the Wind database on equity participation. The data of non-listed financial institutions and the data on long-term equity investment and shareholders of listed companies in the CSMAR database were manually screened to obtain samples.

The size of the company is measured by the natural logarithm of total assets. When the company develops to a certain extent, the investment strategy and financing strategy will change. Larger companies have certain advantages in better use of capital management and improved capital allocation (Li Wenjing, 2017; Zhou Chen, 2019). The management expense ratio (Adm) is measured by the ratio of management expense to operating income. The higher the management expense ratio, the more serious the agency problem of the company's senior management, which may have an adverse impact on the efficiency of capital allocation (Li Wei'an, 2014). Capital intensity (Fixed) is measured by the ratio of fixed assets to total assets. The higher the capital intensity, the more total capital that a company must invest for each unit of operating income, and the lower the efficiency of capital allocation (Chen Lin, 2012; Li Wenjing, 2017). The debt-to-asset ratio (Lev) is measured by the ratio of total liabilities to total assets. When the debt-to-asset ratio is too high, there may be greater financial pressure on the operation of the enterprise, which may have a negative impact on the efficiency of capital allocation (Huang Changfu, 2016). Cash flow (CF) is measured by the ratio of cash flow from operating activities to total assets. The larger the cash flow, the more capital occupied by operating activities, and the more internal capital of the enterprise may promote excessive investment, cause capital waste, and reduce the efficiency of capital allocation (Li Wei'an, 2014). The age to market (Age) is measured by the current year-time to market +1 algorithm. The longer a company operates in a market economy, the more predictable it is for economic operation laws and market development trends, and its ability to adjust development strategies in time will also have a positive impact on improving the efficiency of capital allocation (Liu Jing, 2019).

The specific definitions of variables and related algorithms in this article are shown in Table 1 below:

In order to verify the hypothesis of this article, the following model is constructed to analyze the impact of Industry-finance integration on investment efficiency, and the role of internal governance in regulating Industry-finance integration and investment efficiency, and verify the assumptions:

(1) The impact of the integration of industry and finance on the company's investment efficiency:

$$\text{Inv}_{i,t} = \alpha_0 + \alpha_1 \text{IIF}_{i,t} + \alpha_2 \text{Fixed}_{i,t} + \alpha_3 \text{Lev}_{i,t} + \alpha_4 \text{Size}_{i,t} + \alpha_5 \text{CF}_{i,t} + \alpha_6 \text{Adm}_{i,t} + \alpha_7 \text{Age}_{i,t} + \Sigma \text{Year} + \Sigma \text{Industry} + \varepsilon$$

(2) The impact of internal governance on the integration of industry and finance and investment efficiency:

Table 1. Definition of research variables

Variable name	Variable symbol	Variable definitions
Investment efficiency	Inv	Absolute value of Richardson model residual
Financing efficiency	Fin	Return on investment/cost of capital
Industry-finance integration	IIF	Take 1 for participation in non-listed financial institutions, otherwise take 0
	IIF-n	Number of non-listed financial institutions holding shares
The concurrent appointment of chairman and general manager	CEO	0 if CEO does not serve as chairman, 1 if concurrently
Proportion of independent directors	Dbd	The number of independent directors as a percentage of the total number of board members
Director size	Boardsize	Number of Board of Directors
Number of directors' meetings	Boardmeets	Number of meetings of the board of directors during the year
Equity concentration	Own-con	The largest shareholder's shareholding ratio
Equity checks and balances	Own-bal	(Shareholding ratio of the top ten shareholders-shareholding ratio of the first shareholder) / shareholding ratio of the largest shareholder
Institutional investor shareholding ratio	Inshare	Number of shares held by institutional investors/total number of shares
Executive shareholding ratio	Sharehold	Number of shares held by executives/total number of shares
Top three salaries for executives	Salaries	Top three salaries for executives
Supervisor size	Supervisorsize	Number of Board of Supervisors
Number of meetings of supervisors	Supervisormeet	Number of meetings of the board of supervisors during the year
Comprehensive indicators of internal governance	Gov	A comprehensive index of principal component synthesis based on the above eleven indexes
Company Size	Size	Natural logarithm of total assets
Administrative expense ratio	Adm	Administrative expenses/operating income
Assets and liabilities	Lev	Total liabilities/total assets
Capital intensity	Fixed	Fixed assets/total assets
Cash flow	CF	Net cash flow from operating activities/total assets
Listing years	Age	Current year-time to market + 1

$$Inv_{i,t} = \alpha_0 + \alpha_1 IIF_{i,t} + \alpha_2 Gov_{i,t} + \alpha_3 Fixed_{i,t} + \alpha_4 Lev_{i,t} + \alpha_5 Size_{i,t} + \alpha_6 CF_{i,t} + \alpha_7 Adm_{i,t} + \alpha_8 Age_{i,t} + \Sigma Year + \Sigma Industry + \epsilon$$

$$Inv_{i,t} = \alpha_0 + \alpha_1 IIF_{i,t} + \alpha_2 Gov_{i,t} + \alpha_3 IIF_{i,t} * Gov_{i,t} + \alpha_4 Fixed_{i,t} + \alpha_5 Lev_{i,t} + \alpha_6 Size_{i,t} + \alpha_7 CF_{i,t} + \alpha_8 Adm_{i,t} + \alpha_9 Age_{i,t} + \Sigma Year + \Sigma Industry + \epsilon$$

4. Research Result

4.1. Descriptive Statistics

In this paper, the statistical analysis of the mean, standard deviation, median, minimum and maximum values of the main variables is shown in Table 2. It can be seen that the maximum

and minimum values of the Industry-finance integration (IIF) are 0.98 and 0 respectively, the median is 0, and the average value is 0.207, indicating that companies in the sample that do not participate in the Industry-finance integration account for a relatively large proportion; The mean value (IIF-n) is 0.292, the standard deviation is 0.674, the maximum value is 6.86, and the minimum value is 0, indicating that the degree of integration of industry and finance in my country's listed companies is highly differentiated, and the degree of integration of industry and finance is relatively low. The standard deviation of the investment efficiency (Inv) of the company's capital allocation efficiency is 5.196, and the maximum and minimum are 33.138 and 0.051, respectively, indicating that there are certain differences in the investment efficiency of the companies in the sample. The maximum and minimum financing efficiency (Fin) are 9.549 and 5.217, respectively, indicating that the financing efficiency of each company is not very different. The median 8.650 indicates that most of the listed companies in the sample companies have better financing efficiency. The average value of internal governance (Gov) is 39.452, the standard deviation is 17.977, and the maximum and minimum values are 81.461 and 8.325, respectively, indicating that the internal governance of listed companies in the sample companies is quite different and the overall internal governance is low. The maximum and minimum capital intensity (Fixed) are 0.713 and 0.002, respectively, indicating that the capital intensity of the sample companies is differentiated. The median is 0.194, indicating that most companies have a small proportion of fixed assets in total assets, and the company has surplus. The possibility of capital investment and financing is great. The maximum asset-liability ratio (Lev) is 0.919, the minimum is 0.056, and the median is 0.443, indicating that the asset-liability ratio of most sample companies is reasonable. The standard deviations of company size (Size) and listing age (Age) are 0.562 and 6.309 respectively, and the maximum and minimum values are 11.334, 8.471 and 252, respectively. This shows that although the listing age is relatively large, the difference in company size is not very large. It may be because although listed companies are in different industries, company characteristics, and development speeds, the company's strategy will shift after the company's scale has developed to a certain extent. The standard deviations of cash flow (CF) and management expense ratio (Adm) are 0.072 and 0.087, respectively, indicating that the sample company's cash flow and management expense ratio are not significantly different.

Table 2. Descriptive Statistics of Related Variables

Variable Name	Sample Size	Mean	Standard Deviation	Median	Minimum	Max
Inv	20564	4.347	5.196	2.861	0.051	33.138
Fin	20564	8.484	0.873	8.650	5.217	9.539
IIF	20564	0.207	0.400	0	0	0.98
IIF-n	20564	0.292	0.674	0	0	6.86
Gov	20564	39.452	17.977	38.196	8.325	81.461
Fixed	20564	0.227	0.169	0.194	0.002	0.713
Lev	20564	0.445	0.205	0.443	0.056	0.919
Size	20564	9.433	0.551	9.365	8.302	11.107
CF	20564	0.043	0.072	0.042	-0.176	0.247
Adm	20564	0.100	0.087	0.079	0.010	0.576
Age	20564	11.445	6.183	10.78	1.96	24.5

4.2. Correlation Analysis

In order to further study the relationship between Industry-finance integration and investment efficiency, this paper uses Pearson's correlation coefficient to carry out correlation analysis and statistics. According to Table 3, the correlation coefficient between company investment

efficiency (Inv) and Industry-finance integration (IIF) is -0.046, and it is significant at the 1% level.

Table 3. Correlation analysis of main variables

	Inv	Fin	IIF	IIF-n	Gov	Fixed	Lev	Size	CF	Adm	Age
Inv	1										
Fin	-0.012**	1									
IIF	-0.046***	0.079***	1								
IIF-n	-0.045***	0.078***	0.821***	1							
Gov	-0.055***	0.074***	0.076***	0.087***	1						
Fixed	0.023**	-0.064***	0.051***	0.024	0.091***	1					
Lev	-0.046***	0.005	0.138***	0.130***	0.163***	0.073***	1				
Size	-0.057***	0.159***	0.156***	0.183***	0.409***	0.053***	0.418***	1			
CF	0.031***	-0.006	-0.003	0.006	0.133***	0.251***	-0.160***	0.035***	1		
Adm	0.059***	-0.022***	-0.101***	-0.093***	-0.214***	-0.131***	-0.246***	-0.343***	-0.105***	1	
Age	-0.122***	0.100***	0.131***	0.161***	0.194***	0.021***	0.295***	0.263**	-0.030***	-0.050***	1

Note: ***, **, * represent 1%, 5%, 10% significant level

The larger the value of investment efficiency, the more deviating from the reasonable investment level. The combination has a positive effect on investment efficiency; the correlation coefficient of company financing efficiency (Fin) and the integration of industry and finance is 0.079, and it is significant at the level of 1%, indicating that the integration of industry and finance has a positive effect on the company's financing efficiency. The correlation coefficient between internal governance (Gov) and investment efficiency is -0.055, and the correlation coefficient with financing efficiency is 0.074, and both are significant at the 1% level, indicating that corporate internal governance may promote the improvement of company investment efficiency. Hypothesis 2 provides a basis. The correlation coefficient between company size (Size) and investment efficiency is -0.057; the correlation coefficient between company size (Age) and investment efficiency is -0.122, which is significant at the 1% level, indicating that both the company size and the time of listing are in line with the company's capital allocation efficiency. Significantly positive relationship. After the company develops to a certain stage, it may turn to the role of strategic investor, and more of the company's funds will be transferred to more profitable industries, which is consistent with the conclusions of previous studies (Shen Lu, 2019). The correlation coefficient between the asset-liability ratio (Lev) and investment efficiency is -0.046, indicating that the asset-liability ratio has a certain effect on the company's capital allocation efficiency. The difference from expectations may be because the correlation only considers the asset-liability ratio and the capital allocation efficiency. The relationship between the two is not included in other influencing factors in market economic activities. The correlation coefficient between company capital density (Fixed) and investment efficiency is 0.023; the correlation coefficient between management expense ratio (Adm) and investment efficiency is 0.059, which is significant at the 1% level. Both capital intensity and management expense ratio are related to the company's capital allocation efficiency. The significant negative correlation indicates that the company at this time may be more at the stage of commodity producers. If the company spends more funds on fixed assets and management expenses, it will squeeze the funds for strategic investment, which will affect the capital allocation. The improvement of efficiency has a certain impact (Lee Mangmang, 2018). The correlation coefficient between cash flow (CF) and investment efficiency is 0.031, and is significant at the 1% level, indicating that the company's sufficient cash flow may cause

excessive investment and make investment efficiency deviate from a reasonable investment level (Wang Zhi, 2015).

4.3. Regression Analysis

Table 4 lists the regression results of Industry-finance integration (IIF) and company investment efficiency (Inv). This article will conduct regression testing from the investment efficiency dimension. The table shows that the regression coefficient of Industry-finance integration (IIF) and company investment efficiency (Inv) is -0.463, which is significant at the 1% confidence level, indicating that Industry-finance integration will bring the company's investment efficiency closer to a reasonable level and bring about company investment Efficiency improvement. The results of this table confirm the hypothesis of this article.

Table 4. Regression analysis of Industry-finance integration and investment efficiency

	IIF	Fixed	Lev	Size	CF	Adm	Age	Ind	Year	Constant	Adj R-squared	N
Correlation coefficient α	-0.463	-0.842	-0.861	0.035	1.527	3.383	-0.101	control	control	4.176	0.048	20564
t value	-4.94***	-2.65***	-3.66***	0.39	2.86**	6.26***	-14.19***			4.67***		

Note: ***, **, * represent significant at the significance level of 1%, 5%, and 10%

Table 5. Hierarchical regression of the adjustment effect of internal governance

	Inv			
	Correlation coefficient α		t value	
IIF	-0.515		-5.51***	
Gov	-0.012		-4.98***	
IIF*Gov			-0.002	
Fixed	-0.621		-2.21**	
Lev	0.783		3.38***	
Size	0.123		1.30	
CF	1.683		3.18***	
Adm	3.032		5.79***	
Age	-0.096		-13.78***	
Industry	control		control	
Year	control		control	
Constant	4.894		5.57***	
Adj r-squared	0.040		0.040	
N	20564		20564	

Note: ***, **, * represent significant at the significance level of 1%, 5%, and 10%

Since the internal governance of this article is a continuous variable, regression with product terms is used to test the effect of the adjustment variables. In order to avoid the influence of collinearity between the crossover term and the main variable, this paper focuses on the internal governance (Gov) Industry-finance integration (IIF) and the crossover term between the two. The detailed regression results are shown in Table 5. The regression coefficient of Industry-finance integration and company investment efficiency is -0.426, which is significant at the 10% confidence level, and the regression coefficient of internal governance and corporate investment efficiency is -0.011, which is significant at the 1% confidence level, indicating that the Industry-finance integration and investment efficiency Internal governance has a positive impact on investment efficiency; the regression coefficient of the crossover term of internal governance and the integration of industry and finance is -0.002, but it is not significant, which

may be due to the contribution of the interaction term of internal governance and integration of industry and finance to investment efficiency. The role has been replaced by the integration of industry and finance and internal governance, indicating that internal governance does not significantly regulate the integration of industry and finance and investment efficiency.

5. Conclusion

The integration of industry and finance can alleviate the funding bottleneck caused by the rapid development of industrial capital and provide a financing service platform for the implementation of industrial expansion. The integration of industry and finance allows financial institutions and companies to better understand each other in terms of capital, information, and talents. Not only does it reduce the time cost and transaction costs caused by corporate financing, but the repayment method and time are more flexible, which improves the efficiency of corporate financing. Being able to accept supervision and guidance from financial institutions allows companies to seize investment opportunities in the expansion of industrial capital, reduce unnecessary self-waste, and improve investment efficiency. After investigating the adjustment effect of the company's internal governance, it is found that the adjustment effect of the company's internal governance on the relationship between industry and finance integration and investment efficiency is not obvious. Therefore, internal governance, as a channel of the company's internal supervision, has an important influence on the company's investment and financing decisions, and to a certain extent avoids the abuse of funds that causes excessive investment or changes in the use of funds.

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