

ANALYSIS OF THE EFFECT OF EQUITY INCENTIVE ON CORPORATE FINANCIALIZATION AND INNOVATION INVESTMENT

BO LIN AND XIAORU XUE*

School of Economics and Management
Dalian University

No. 10, Xuefu Street, Jinzhou New District, Dalian 116622, P. R. China

*Corresponding author: xuexiaoru@s.dlu.edu.cn

Received January 2021; accepted March 2021

ABSTRACT. *This paper selects A-share and non-financial listed companies in the Shanghai and Shenzhen stock markets from 2014 to 2018 as samples, and uses fixed-effect model to explore the relationship between corporate financialization and innovation investment, as well as the moderating effect of equity incentives on the two. It further explores the different regulatory effects of executive equity incentives and core technical staff equity incentives. The study found that corporate financialization has a significant inhibitory effect on innovation investment. In the context of corporate financialization, equity incentives will play a positive role in regulating corporate investment. And after comparison, in terms of incentive effects, the implementation of executive equity incentives has a more significant role in promoting enterprise innovation investment.*

Keywords: Corporate financialization, Innovation investment, Executive equity incentive, Core technical staff equity incentive

1. **Introduction.** The advent of the knowledge economy promotes the gradual transformation of China's economic development from factor-driven to innovation-driven, and enterprises play an important role in the development of innovation. However, with the gradual deepening of economic financialization, the investment methods of enterprises have changed. In order to maximize short-term benefits, many companies choose financial assets with short return periods, high returns and strong asset liquidity, namely there is a phenomenon of corporate financialization. Once financial investment squeezes out limited corporate resources, it will cause companies to reduce industrial investment, especially innovation investment [1]. At the same time, many enterprises implement a system of separating ownership and management, which makes the goals of owners and managers divergent. The owners focus on maximizing benefits. They hope to strengthen the core competitiveness of enterprises by increasing innovation investment, so as to achieve rapid development of the enterprise. Managers pay attention to the maximization of utility and pursue the maximization of short-term interests of the enterprise. Therefore, managers are more inclined to choose financial assets with short periods and high returns to reduce innovation investment. To improve this problem, companies will take a series of measures, such as the implementation of equity incentive plans [2]. In view of this, this article will study the effect of equity incentives on corporate financialization and innovation investment. The research in this article is of great significance to the real economy's "removing from the virtual to the real" and the improvement of corporate competitiveness. It also provides a scientific and reasonable equity incentive plan for the company.

The research contributions of this article are mainly reflected in the following aspects. First, most of the existing literature studies the relationship between enterprise financialization and enterprise innovation investment [3-5,8] or the relationship between equity incentive and innovation investment [6,7]. Few articles take equity incentive as a moderating variable to study its effect on enterprise financialization and innovation investment. Therefore, this paper extends the existing research content to deeply analyze the influence of equity incentive on enterprise financialization and innovation investment. Second, most of the current domestic research on equity incentive focuses on executive equity incentive, but ignores another form of equity incentive, core technical staff equity incentive. This paper further discusses the regulating effect of core technical staff equity incentive on enterprise financialization and innovation investment, thereby increasing the scope of research objects.

The structure of this paper is as follows: the second part is theoretical analysis and the proposal of research hypothesis, the third part is research data and research design, the fourth part is empirical results and analysis, and the fifth part is research conclusions and policy recommendations.

2. Theoretical Analysis and Research Hypothesis.

(i) Corporate financialization and corporate innovation investment

In recent years, China's economy has shown a trend of "de-realization to virtual". More and more entity companies are deviating from their original main business and relying on financial investment, which has led to the emergence of corporate financialization [8]. The reasons for this phenomenon can be summarized into the following two. First, the enterprise realizes capital arbitrage in order to increase profits. The second is to allocate financial assets based on the purpose of preventive reserves and reduce the risk of business operations [9]. If the entity enterprise is driven by profit and increases its investment in financial assets, it will inevitably lead to a decrease in entity investment [10]. If an entity company invests in financial assets for capital reserves, it will also have a negative impact on the company's innovation investment. Because enterprise innovation has the characteristics of long cycles, high risks, and information asymmetry. In order to avoid possible future financial difficulties, enterprises will choose to invest in more financial assets instead of innovation investment [11]. Based on the above, the following hypotheses are put forward:

H1: The financialization of enterprises will have a restraining effect on enterprises' innovation investment.

(ii) Equity incentives and corporate financialization and innovation investment

As the "decision makers" of enterprises, senior managers are one of the important factors influencing enterprise innovation activities. However, in order to chase short-term returns, managers tend to invest in higher-yielding financial assets and reduce innovation activities that are beneficial to long-term operations. The introduction of equity incentive plans will enable managers to pay attention to long-term business goals, increase their ability to resist risks, and increase innovation investment [12]. From this, the following assumptions can be made:

H2: The implementation of executive equity incentives will positively regulate the relationship between corporate financialization and corporate innovation input.

As an important part of the company's management, employees, although they cannot determine the company's financial assets and innovation investment allocation, are the "executors" of corporate innovation. Employees, especially core technical employees, are the source of many innovative ideas, and their efforts and collaboration are more related to the efficiency of the implementation of innovation policies [13]. The equity incentive plan includes core technical personnel, which has an important impact on corporate innovation. First of all, equity incentives for core technical employees can send an "employee-oriented"

signal [14] and mobilize the innovation enthusiasm of core technical employees. Secondly, the cooperation and supervision between core technical staff, core technical staff and managers can be strengthened to strengthen corporate stability. It can also slow down the managers' assessment of corporate risks, and thus rationally allocate assets. However, since the core technical staff has no decision-making power, they can only influence the managers' decisions. Therefore, the moderating effect of the core technology employee stock ownership plan on corporate financialization and innovation investment may be weaker than that of executive equity incentives. Therefore, in order to demonstrate these issues, this article proposes the following hypotheses:

H3a: The implementation of equity incentives including core technical employees will obviously adjust the relationship between corporate financialization and corporate innovation investment.

H3b: The effect of implementing core technology employee stock ownership plans on corporate financialization and innovation investment is weaker than executive equity incentives.

3. Research Design.

(i) Sample selection and data source: The sample period selected in this article is from 2014 to 2018, and A-share listed companies in Shanghai and Shenzhen stock markets are selected as the research objects. This article screens the samples as follows: ① Exclude companies that have seen ST (stocks subject to special treatment) and *ST (stocks subject to delisting risk warning) during the sample period; ② Exclude data on innovation and innovation investment incomplete companies; ③ Exclude financial and real estate companies and companies with incomplete financial data. After screening, this paper has got 835 effective observations. In order to eliminate the influence of outliers on the regression results, this paper performs 1% Winsorize processing on the main variables. The equity incentive data, corporate financial data, and corporate innovation investment data are all from the CSMAR database.

(ii) Empirical model. In order to explore the relationship between the financialization of enterprises and their innovative investment in the first question, the following model is constructed for reference:

$$IRD_{i,t} = \gamma_0 + \gamma_1 FIN_{i,t} + \gamma_2 SIZE_{i,t} + \gamma_3 LEV_{i,t} + \gamma_4 ROA_{i,t} + \gamma_5 GROW_{i,t} + \gamma_6 FEE_{i,t} + \gamma_7 YEAR + \varepsilon_{i,t} \quad (1)$$

Explained variable: the level of enterprise innovation investment (IRD), which is measured by the ratio of innovation investment to total assets. The larger the ratio, the greater the impact on the enterprise's internal technological innovation capabilities.

Explanatory variable: the financialization of enterprises (FIN). This article uses the proportion of non-monetary financial assets in total assets to measure the degree of financialization of enterprises. Non-monetary financial assets mainly include transactional financial assets, derivative financial assets, available-for-sale financial assets, held-to-maturity investments, long-term equity investments and investment real estate.

Moderating variables: including executive equity incentive (EI) and core technical employee equity incentive (ESOP). Executive EI is measured by the ratio of the number of shares held by the company's senior management to the company's total shares at the end of the year. The ESOP is measured by the ratio of the number of shares held by core technical employees to the total number of shares.

Control variables: taking account of the influence of other factors on enterprise innovation, the enterprise scale, capital structure, growth and management expense rate are selected as control variables on the basis of existing literature. Enterprise size (SIZE) is measured by the natural logarithm of total assets, and capital structure (LEV) is measured by the ratio of total liabilities to total assets. Return on assets (ROA) uses the

ratio of annual total profits to total assets. Growth (GROW) is measured by operating income growth rate. The management expense ratio (FEE) is measured by the ratio of the management expense to the main business of the year, which is used to reflect the management level of the enterprise.

In order to further verify the moderating effect of equity incentives on corporate finance and innovation investment, this paper adds the moderators based on Model 1. Mod represent the moderating variables, which are EI and ESOP. In order to examine the moderating effect of moderating variables, the interaction terms of moderating variables and independent variables are introduced to measure the effect of the interaction terms of equity incentives and corporate financialization on corporate innovation investment.

$$IRD_{i,t} = \gamma_0 + \gamma_1 FIN_{i,t} + \gamma_2 SIZE_{i,t} + \gamma_3 LEV_{i,t} + \gamma_4 ROA_{i,t} + \gamma_5 GROW_{i,t} + \gamma_6 FEE_{i,t} + \gamma_7 YEAR + \gamma_8 Mod_{i,t} + \gamma_9 Mod_{i,t} \times FIN_{i,t} + \varepsilon_{i,t} \quad (2)$$

Among them: the subscript i represents the sample of the enterprise, and the subscript t represents the research time. γ_0 is a constant term, $\gamma_1 \sim \gamma_9$ are the regression coefficients of variables, and $\varepsilon_{i,t}$ is the residual term. The focus of this article is γ_1 and γ_9 .

4. Empirical Results and Analysis.

(i) Descriptive statistical analysis. As shown in the results in Table 1, the statistical value of IRD shows that the internal innovation investment of enterprises is small, and the importance of innovation investment varies greatly. From the value of FIN, it can be seen that the degree of enterprise financialization is not very deep, but some enterprises financialization phenomenon is obvious. The shareholding ratio of senior management and core technical personnel also fluctuated greatly. The statistical value of SIZE in the control variable reflects that the scale of assets accumulated by the sample enterprises is generally higher. LEV reflects that the sample companies have varying degrees of debt, some of which have higher debt ratios. ROA's descriptive statistics show that most companies are profitable. The mean value of GROW shows that the sample enterprises still have a lot of room for growth, but some of them are not optimistic about their business performance. There is a significant difference between the minimum and maximum values of FEE, and it is concluded that the management level of the sample enterprises has a significant gap. In summary, there are significant differences among sample companies.

TABLE 1. Descriptive statistics table

Variable	Obs	Mean	Std.Dev.	Min	Max
IRD	835	.032	.023	.001	.108
FIN	835	.057	.071	0	.367
EI	835	.003	.004	0	.019
ESOP	835	.015	.013	0	.068
SIZE	835	22.403	1.057	20.525	25.798
LEV	835	.389	.174	.07	.767
ROA	835	.066	.059	-.204	.243
GROW	835	.255	.300	-.290	1.57
FEE	835	.119	.074	.015	.372

(ii) Correlation analysis. In Table 2, the coefficients of FIN and IRD are negative, and there is a significant negative correlation between the two. It is consistent with the H1 hypothesis, but the influence of other variables is not considered. So specific research is needed. The coefficients of EI and IRD are negative, but not significant. There may still be a phenomenon that the management chooses the operating method that maximizes their own interests, which deviates from the business objectives of the company. However, in the context of corporate financialization, the relationship between EI and IRD still needs

TABLE 2. Correlation coefficient matrix

	IRD	FIN	EI	ESOP	SIZE	LEV	ROA	GROW	FEE
IRD	1								
FIN	-0.066*	1							
EI	-0.0330	-0.118***	1						
ESOP	0.160***	-0.101***	0.460***	1					
SIZE	-0.103***	0.185***	-0.168***	-0.0440	1				
LEV	-0.162***	0.0490	-0.0300	0.0270	0.537***	1			
ROA	0.129***	-0.079**	-0.00600	0.085**	-0.0360	-0.314***	1		
GROW	-0.00600	-0.0390	0.0160	-0.00100	-0.0440	-0.00800	0.242***	1	
FEE	0.565***	0.121***	-0.0310	0.099***	-0.274***	-0.364***	-0.070**	-0.0570	1

Note: *, **, *** correspond to significant correlation at the levels of 10%, 5%, and 1%

further discussion. There is a significant positive correlation between ESOP and IRD, which preliminarily shows that the implementation of core technical staff motivation can stimulate core technical staff’s enthusiasm for innovation, thereby promoting enterprises’ attention to enterprise innovation and increasing investment in innovation. SIZE and IRD show a negative correlation. This reflects that the larger the enterprise, the lower the level of innovation input. The coefficients of ROA and FEE with IRD at the 1% level are 0.129 and 0.565, respectively, which preliminarily reflects that the higher the return on assets of a company, the higher the level of corporate management, the more conducive to increasing innovation investment.

(iii) Analysis of regression results. For further exploration, this article chooses the fixed effects model. From the results of (1) in Table 3, it can be seen that the coefficient of corporate financialization and corporate innovation investment at the 1% level is -0.047, which is a significant negative correlation. This result is consistent with H1, that is, with the deepening of corporate financialization, it will have a crowding out effect on corporate innovation investment, squeezing out about 4.7% of innovation investment.

From the result of (2) in the table, it can be concluded that EI and IRD are significantly negatively correlated at the 1% level, but the coefficients of EI×FIN and IRD are

TABLE 3. Analysis of regression results

	(1) IRD	(2) IRD	(3) IRD
FIN	-0.047*** (-5.06)	-0.074*** (-6.28)	-0.063*** (-5.14)
SIZE	0.001 (1.22)	0.001 (1.17)	0.001 (1.36)
LEV	0.017*** (3.41)	0.016*** (3.28)	0.015*** (3.07)
ROA	0.082*** (6.76)	0.081*** (6.76)	0.078*** (6.46)
GROW	-0.002 (-0.78)	-0.002 (-0.74)	-0.002 (-0.81)
FEE	0.205*** (21.40)	0.204*** (21.43)	0.201*** (20.77)
EI		-0.735*** (-3.00)	
EI×FIN		11.979*** (3.64)	
ESOP			0.019 (0.28)
FIN×ESOP			1.657** (2.27)
YEAR	control	control	control
-cons	-0.022 (-1.38)	-0.019 (-1.16)	-0.023 (-1.48)
N	835	835	835
r ²	0.380	0.390	0.388
r _a ²	0.376	0.384	0.382
F	84.660	66.101	65.475

*p < 0.1, **p < 0.05, ***p < 0.01

positive at the 1% level. It shows that the implementation of executive equity incentives will significantly adjust the negative relationship between corporate financialization and corporate innovation investment, confirming H2. Although after the implementation of executive equity incentives, managers still put their own interests in the first place, the implementation of executive equity incentives can indeed make managers pay more attention to the long-term benefits of the company, thereby reducing the allocation of financial assets to a certain extent and increase corporate innovation investment.

The results in (3) in the table are significantly positively correlated with $ESOP \times FIN$ and IRD at the 1% level. This shows that the implementation of core technology equity incentives can also reduce the crowding-out effect of corporate financialization on corporate innovation, confirming H3a. Equity incentives for core technical employees can further stimulate their enthusiasm for work research and development. The relationship coefficients of $EI \times FIN$, $ESOP \times FIN$ and IRD are 11.979 and 1.657, respectively, indicating that the implementation of executive equity incentives can weaken the negative impact of corporate financialization on corporate innovation investment more than core technical employee equity incentives, which proves H3b. Managers, as the decision makers of business activities, can determine the allocation structure of corporate funds. When the interests of managers are guaranteed to a certain extent, managers will pay attention to the long-term development of the enterprise, thereby increasing corporate innovation investment. The implementation of equity incentives for core technical employees will increase the innovation of core technical employees, but the innovation cycle is still long. In a short period of time, the innovation performance of employees cannot be reflected, and it has little impact on managers' asset allocation decisions. Therefore, the impact of the implementation of core technical employee equity incentives on corporate financial asset allocation and entity investment is less than the impact of the implementation of executive equity incentive plans.

(iv) Robustness analysis: In order to further improve the reliability of the empirical results, this paper conducts a robustness analysis. This paper takes the ratio of R&D investment to main business income as a substitute variable for the level of innovation investment. Use financial rate of return (FRR) to replace the degree of corporate financialization (FIN), FRR is (net profit and loss from changes in fair value + investment income)/operating profit. The results of the empirical research were tested. The results of the test regression are basically consistent with the results of the empirical regression.

5. Research Conclusions and Policy Recommendations. In summary, the following conclusions can be drawn from this article: the level of corporate financialization is negatively related to corporate innovation investment. Equity incentives can weaken the negative relationship between the level of corporate financialization and corporate innovation investment, and the effect of implementing executive equity incentives on the relationship between the two is better than implementing equity incentives for core technical employees. The policy recommendations of this article are as follows. First, government departments should improve the financial market system, guide enterprises to correctly participate in financial investment activities and encourage them to serve the real economy. Second, for enterprises, to coordinate the relationship between financial investment activities and the development of the real economy. They should attach importance to the long-term benefits brought by enterprise innovation. Third, equity incentive can well improve the problem of crowding out innovation investment brought about by corporate financialization. Enterprises should appropriately increase the intensity of equity incentives, and to a greater extent choose executive equity incentives.

REFERENCES

- [1] W. Milberg and N. Shapiro, Implications of the recent financial crisis for firm innovation, *Journal of Post Keynesian Economics*, vol.36, no.2, pp.207-230, 2013.
- [2] C. Lu, M. Yan, H. Zheng and J. Xu, Why do listed companies choose equity incentive plans?, *Accounting Research*, vol.1, pp.68-75, 2011.
- [3] S. Cupertino, C. Consolandi and A. Vercelli, Corporate social performance, financialization, and real investment in US manufacturing firms, *Sustainability*, vol.11, no.7, 2019.
- [4] Y. Peng, X. Han and J. Li, Economic policy uncertainty and corporate financialization, *China Industrial Economy*, vol.1, pp.137-155, 2018.
- [5] L. E. Davis, Financialization and the nonfinancial corporation: An investigation of firm-level investment behavior in the U.S., *Metroeconomica*, vol.69, pp.270-307, 2018.
- [6] D. Tori and Ö. Onaran, *The Effects of Financialisation and Financial Development on Investment: Evidence from Firm-Level Data in Europe*, Working Paper 1705, 2017.
- [7] L. Chen and Y. Chen, Managerial incentives and R&D investments: The moderating effect of the directors, and offices, liability insurance, *The North American Journal of Economics and Finance*, vol.39, pp.210-222, 2017.
- [8] F. Deng and Y. Li, Managerial ability, ownership and innovation investment: Empirical evidence based on high-tech listed companies, *Journal of Industrial Technological Economics*, vol.38, no.1, pp.19-26, 2019.
- [9] Y. Hu, X. Wang and J. Zhang, Motivation for financial asset allocation: “Reservoir” or “Replacement” – Evidence from Chinese listed companies, *Economic Research*, vol.1, pp.181-194, 2017.
- [10] G. Liu, Financial asset allocation and enterprise R&D innovation: “Crowding out” or “crowding in”, *Statistical Research*, vol.34, no.7, pp.49-61, 2017.
- [11] Z. Ni, K. Zhang and K. Song, Financialization of entity enterprises and enterprise innovation capability, *Business Research*, vol.10, pp.31-42, 2019.
- [12] J. S. Miller, R. M. Wiseman and L. R. Gomez, The fit between CEO compensation design and firm risk, *Academy of Management Journal*, vol.45, no.4, pp.745-756, 2002.
- [13] D. Kong, M. Xu and G. Kong, Salary gap and innovation within enterprises, *Economic Research*, vol.10, pp.144-157, 2017.
- [14] H. Yang, The impact of the scope of key employee equity incentives on enterprise technological innovation, *Finance and Accounting Monthly*, vol.20, pp.78-84, 2018.