Research on the Effects of Businesses Transitioning from the Real Economy to the Virtual Economy on Investing in Innovative Talents

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Abstract. "Talent acquisition is the only route to innovation." Enterprises' ability to sustain innovation, preserve economic stability, and advance sustained social progress depends on their access to excellent talents. However, as the investment of enterprises shifts from the real economy to the virtual economy, it is widely believed in society that corporate financialization will squeeze the investment resources of enterprises' main businesses. Therefore, the focus of this paper is whether this resource squeeze includes human resources. The main question addressed here is whether or not human resources are being squeezed. This paper empirically examines the effect of corporate financialization on creative abilities using a sample of A-share listed manufacturing businesses from 2010 to 2020. The study's findings demonstrate that businesses' need for innovative talents is greatly suppressed as corporate financialization increases.Specifically,when the degree of financialization of enterprises increases by 1%, the demand of enterprises for innovative talents decreases by 0.247%.

Keywords: corporate financialization, investment in innovation, human resources.

1 Introduction

In the report of the 19th National Congress of the Communist Party of China, Chinese President Xi Jinping underlined that science and technology are the primary productive force, talents are the first resources, and innovation is the primary driving force. As a result, we must fully implement the methods of reviving the nation via science and education, bolstering the nation through talent, and fostering innovation to drive development, explore new terrain and avenues, and continuously forge ahead with new advantages. This amply depicts how innovation is the heart of societal development and an unstoppable engine for a nation's success. We must concentrate on talents, particularly innovation and technology talents, if we want to establish an innovative nation. These skills will play a significant role as a source and engine for societal and national advancement. The value of innovative talents for businesses, particularly manufactur-

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ing businesses, is obvious. Therefore, we must firmly promote the cultivation and development of innovative talents, making them a cornerstone force that drives social development and sustained corporate growth.

However, as the capital market has continued to develop, businesses have started to concentrate their attention on financial investment sectors such as trading financial assets and investment real estate, either for risk avoidance tactics or capital-seeking goals[1]. This capital-oriented approach to resource allocation has significantly reduced the physical resources invested by businesses and constrained their traditional production and operation operations. In the short term, it might outperform industrial investments in terms of rate of return, but over time, it will surely reduce the resources allocated to the primary company, which will have an impact on how the entity part of the organization develops. This will specifically have an impact on the creative manufacturing sector, which will unavoidably have an impact on the innovation dynamics of the enterprise[2]. Shen Wangqi examined the connection between equity ownership, corporate financialization, and innovation investment in a study based on China's industrial firms that went public. The study discovered that non-state-owned businesses are disproportionately affected negatively by corporate financialization with regard to innovation investment[3]. Wu Jinli looked at the chairman's financial background as a moderating factor while analyzing the effects of corporate financialization on R&D. The findings demonstrated that a company's investment in technological innovation is greatly crowded out by corporate financialization, and that the chairman's financial background exacerbates this crowding-out impact[4]. The study by Yang Xiao also demonstrated that firms' strong allocation of financial assets will displace their investment in innovation, regardless of how uncertain economic policy may be[5]. Despite the fact that many academics have examined the effects of corporate financialization on innovation investment, their studies have largely concentrated on money investment and little talent investment. To widen the scope of related research, this paper investigates how corporate financialization affects the investment in innovative talent.

2 Theoretical Analysis and Hypothesis Proposal

The "Reservoir Effect" and the "Crowding-out Effect" are two approaches that can approximately be used to categorize the effects of corporate financialization on innovation investment. According to the "Reservoir Effect" idea, there are some financing restrictions between businesses and investors as a result of knowledge asymmetry, which makes it difficult for businesses to raise capital. However, to a certain extent, the distribution of financial assets might assist in resolving the funding issues faced by businesses[6]. On the other hand, financial assets typically provide great liquidity and quick returns. An organization can immediately exchange the assigned financial assets if it encounters unanticipated financial challenges while conducting business[7]. In this context, Gu et al. have shown that high-tech companies that are listed on the Shenzhen Stock Exchange's Small and Medium Enterprises Board invest more in R&D the more financially literate they are[8]. Beck et al. believed that after businesses distribute finan-

cial resources, they will optimize the asset allocation process and increase the operational effectiveness of their resources, both of which will surely help them grow creatively [9]. The "Crowding-out Effect" idea contends that businesses' own resources are constrained. Financial assets that businesses choose to assign will invariably take up space that was previously used by the primary business. Whether businesses are driven by profit or prevention, from the standpoint of investment substitution, the investment in the primary business that was replaced by financial assets is itself a form of crowding out. Therefore, Zeng et al. proved the inhibitory relationship between corporate financialization and innovation investment using A-share manufacturing companies as a sample, while stating that financing constraints will magnify this inhibitory effect[10]. Following the constant evolution of the real economy into virtual finance and the interplay between the real and financial sectors, Amit Bhaduri researched the fragility of finance and future crises that can occur. The findings indicated that the virtual financial system kept expanding. The national economy and the inventive growth of businesses would suffer enormous tragedies as a result of the abrupt collapse of financial information[11]. According to research by Dong et al., who looked at the influence of company financialization on innovation investment from the angle of appropriateness, the impact of corporate financialization on innovation investment exhibits an inverted U-shaped connection under specific appropriateness. Corporate financialization has a crowding-out effect on innovation investment if it deviates from the related appropriateness [12]. The negative impacts of excessive financialization on investment should therefore be substantially more severe, even though the conclusions about the impact of corporate financialization on innovation investment are not yet consistent. Additionally, these negative impacts have a considerable impact on talent investment in addition to the funding of innovation. As a result, this paper suggests the following:

Hypothesis: Investment in innovative talents will decrease as company financialization continues to increase.

3 Research Design

3.1 Measurement model design

This article examines the impact of enterprise financialization on the demand for research and development personnel and introduces opprofit_pro (operating profit margin), ROA_A (return on assets), EPS_b (basic earnings per share), SOE (nature of enterprise), Shrcr10 (concentration of shareholding), Shr10con (whether the top ten shareholders are related), stkler (Herfindahl index), and sai (financing constraints) as control variables. The model in this article controls for time-fixed effects and industry-fixed effects. To test the hypothesis, the article establishes Model (1), whose formula is as follows:

$$RDR_{i,t} = \alpha + \beta_1 Fin_{i,t} + \beta_2 opprofit\_pro_{i,t} + \beta_3 ROA\_A_{i,t} + \beta_4 EPS\_b_{i,t} + \beta_5 SOE_{i,t} + \beta_6 Shrcr10_{i,t} + \beta_7 Shr10con_{i,t} + \beta_8 stkler_{i,t} + \beta_9 sai_{i,t} + \varepsilon_{i,t} \quad (1)$$

3.2 Variable description

In the equation above, RDR is the dependent variable representing the impact of corporate financialization on the demand for research and development personnel, which can be expressed by the proportion of R&D personnel. Fin is the core explanatory variable representing corporate financialization. The control variables in the model mainly include opprofit_pro (operating profit rate), ROA_A (return on total assets), EPS_b (basic earnings per share), SOE (state ownership), Shrcr10 (concentration of equity), Shr10con (whether the top ten shareholders are related), stkler (Lerner index), and sai (financing constraints). The model also controls for year and industry effects. If the coefficient β1 in Model (1) is significantly negative at the 5% level, then the hypothesis is supported, indicating that corporate financialization will reduce the demand for research and development personnel.

3.3 Data description

Multiple reliable observations are acquired by screening the financial data and indicators of manufacturing listed businesses on the Shanghai Stock Exchange and Shenzhen Stock Exchange from 2010 to 2020. Some variables were winorized at 1 percent both from the top and bottom to reduce the effect of outliers on regression findings. The explanatory variables, dependent variables, and control variables in this study were then subjected to descriptive statistical analysis. Table 1 presents the outcomes. In this study, the explanatory variables, dependent variables, and control variables underwent a descriptive statistical analysis from five perspectives: mean, standard deviation, lowest value, median value, and maximum value.

Table 1. Descriptive statistics of key variables

	count	mean	sd	min	p50	max
RDR	6136	15.297	13.560	0.300	11.905	67.970
Fin	6136	8.488	2.299	1.966	8.700	13.241
opprofit_pro	6136	7.998	15.050	-65.808	7.383	53.995
ROA_A	6136	0.037	0.057	-0.230	0.035	0.195
EPS_b	6136	0.339	0.500	-1.295	0.258	2.360
SOE	6136	0.359	0.480	0.000	0.000	1.000
Shrcr10	6136	57.221	14.613	24.972	57.237	90.555
Shr10con	6136	2.287	0.505	1.000	2.000	3.000
stkler	6136	0.104	0.107	-0.239	0.091	0.468
sai	6136	-3.801	0.233	-4.358	-3.799	-3.101

4 Empirical Testing and Result Analysis

4. 1 Correlation analysis

The dependent variable, independent variable, and control variables were the three main variables in this study that underwent a correlation analysis. Table 2 displays the correlation analyses' findings.

Table 2. Correlation analyses

$^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

	RDR	Fin	op-profit_pro	ROA_A	EPS_b	SOE	Shrcr10	Shr10con	stkler	sai
RDR	1.000									
Fin	-0.058***	1.000								
op-profit_pro	0.075***	0.079***	1.000							
ROA_A	0.057***	0.021	0.831***	1.000						
EPS_b	-0.012	0.107***	0.630***	0.773***	1.000					
SOE	-0.184***	0.134***	-0.090***	-0.108***	-0.009	1.000				
Shrcr10	-0.090***	0.046***	0.152***	0.178***	0.233***	0.031**	1.000			
Shr10con	-0.080***	0.076***	-0.058***	-0.043***	-0.023*	0.267***	-0.111**	1.000		
stkler	0.066***	0.050***	0.736***	0.598***	0.487***	-0.136**	0.196***	-0.080***	1.000	
sai	0.084***	0.047***	0.017	0.020	0.043***	-0.144**	0.218***	-0.077***	0.047***	1.000

The correlation between corporate financialization and investment in innovative talent is significantly negative at the 1% level, as shown in the table above. This finding supports the hypothesis because it shows that as businesses become more financially integrated, investments in innovative talents have been seriously squeezed out.

4.2 Multicollinearity analysis

This study used the variance inflation factor (VIF) test to determine whether the variables were multicollinear to guarantee the accuracy of the regression model. When all of the variables' VIF values are less than 10, it is statistically accepted that the model does not exhibit severe multicollinearity. In Table 3, the multicollinearity test's findings are presented.

Table 3. Multicollinearity test

Variable	VIF	1/VIF
ROA_A	2.18	0.4583
EPS_b	1.60	0.6267
opprofit_pro	1.56	0.6426
SOE	1.13	0.8811
Shrcr10	1.11	0.8981
Shr10con	1.09	0.9158
sai	1.08	0.9296
Fin	1.04	0.9613
stkler	1.00	0.9985
Mean VIF	1.31	

As can be seen from the table above, the VIF values of each variable in the model are significantly less than 10, indicating that there is no multicollinearity in the model. Therefore, the hypothesis that the behavior of a company shifting from substance to virtual will have adverse effects on the innovation talents of the company is significantly established.

4.3 Benchmark regression analysis

In this paper, a multiple regression analysis is conducted to investigate the impact of corporate financialization on the demand for scientific research personnel, gradually incorporating the influence of control variables, year and industry effects. The regression results are shown in Table 4.

Table 4. Benchmark regression results

	(1) RDR	(2) RDR	(3) RDR
Fin	-0.342***	-0.203***	-0.247***
	(-4.829)	(-2.815)	(-3.813)
opprofit_pro		0.070**	0.060**
		(2.297)	(2.335)
ROA_A		11.089	6.508
		(1.470)	(1.012)
EPS_b		-2.205***	-1.774***
		(-4.017)	(-3.920)
SOE		-3.932***	-1.939***
		(-10.794)	(-5.749)
Shrcr10		-0.104***	-0.055***
		(-8.242)	(-5.070)
Shr10con		-1.079***	-0.459

		(-3.175)	(-1.540)
stkler		2.314	0.986
		(0.747)	(0.376)
sai		5.052***	4.242***
		(6.616)	(5.934)
_cons	18.196***	45.579***	43.886***
	(29.720)	(13.736)	(14.650)
Ind	No	No	Yes
Year	No	No	Yes
N	6136	6136	6136
R^2	0.003	0.059	0.304

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

The first column in the table above displays the regression results without control variables, the second column displays the results with control variables, and the third column displays the results with control variables, year and industry effects. It is clear that financialization has a large negative influence on the need for inventive talent, as evidenced by the fact that the financialization of businesses significantly reduces the demand for research and development staff..The effect of specific demand is shown in column 3 of the results,when the degree of financialization of enterprises increases by 1%, the demand for scientific research personnel of enterprises decreases by 0.247%.

4.4 Heterogeneity Analysis of Property Rights

Due to the different nature of corporate property rights, the impact of a large investment in financial assets on innovative talent varies. Due to certain inherent advantages of state-owned enterprises, banks are more willing to lend to them, and with government support, state-owned enterprises have a much greater capital advantage than private enterprises. Therefore, the resource squeeze effect after financialization is relatively small. Secondly, due to the strong stability of state-owned enterprises, many seekers will prefer to choose state-owned enterprises when choosing a company, which also leads to differences in the results of recruitment of talents. In view of these differences, this article categorizes and discusses the different effects of financialization on innovative talents between state-owned and non-state-owned enterprises. Table 5 shows the results of the grouped analysis.

Table 5. Heterogeneity Analysis - Equity Nature

	State-owned enterprises RDR	Non-state-owned enterprises RDR
Fin	-0.103	-0.342***
	(1.265)	(2.772)
opprofit_pro	-0.006	-0.014***
	(-1.418)	(-3.679)
ROA_A	-0.055	-0.115

	(-1.225)	(-1.504)
EPS_b	0.004**	0.003
	(2.272)	(1.461)
SOE	0.010*	0.027**
	(1.803)	(2.103)
Shrcr10	0.051**	0.009
	(2.372)	(0.308)
Shr10con	-0.020	-0.012
	(-1.569)	(-0.586)
stkler	-0.006	0.002
	(-1.140)	(0.263)
sai	5.052***	4.242***
	(6.616)	(5.934)
_cons	0.359***	0.574***
	(4.303)	(5.887)
Industry	Yes	Yes
Year	Yes	Yes

From Table 5, we can see that both state-owned and non-state-owned enterprises have a negative impact of financialization on innovative talents, but the negative impact of state-owned enterprises is not significant, while the negative impact of non-state-owned enterprises is significant at the 5% level. This not only confirms the negative impact of financialization on innovative talents, but also demonstrates the difference in the impact of financialization on innovative talents between state-owned and non-state-owned enterprises.

4.5 Endogeneity test

This study conducts an endogeneity test using three instrumental variables: the ratio of financial income to net profit, the proportion of financial assets over the lagged one and two periods (i.e., the degree of business financialization), and the ROI ratio of investment income to net profit. A weak instrument test is used after the Hausman test to confirm the accuracy of the instrumental variables. Finally, analysis is performed using the two-stage least squares method.

The validity of the instrumental variables was first validated in this part using the Hausman test. As indicated in Table 6, the p-value is 0.0056, suggesting that the model has an endogeneity problem, which leads to erroneous regression and skewed regression results. As a result, the instrumental variable technique used in this paper outperforms simple least squares regression.

Table 6. Hausman test

Test Methodology	Statistic Value	P-value
Hausman Test	54.54	0.0056

A weak instrument test should be performed on the chosen instrumental variables, and the test results are displayed in Table 7 with a p-value of 0.000. The instrumental factors used for this investigation are powerful, as evidenced by the significant rejection of the null hypothesis at a level of significance of 5%.

Table 7. Weak instrument test

Variables	R2	Statistic	P Value
Fin	0.7620	1638.9	0.000

This section continues to use the 2SLS two-stage least squares method for regression analysis, and the results are shown in the table 8.

Table 8. Two-stage least squares regression results

	(1)	(2)
	RDR	RDR
Fin	-0.247***	-0.414***
	(-3.697)	(-3.178)
opprofit_pro	0.060***	0.050
	(2.843)	(1.509)
ROA_A	6.508	8.383
	(1.103)	(0.872)
EPS_b	-1.774***	-1.801**
	(-3.698)	(-2.293)
SOE	-1.939***	-1.770***
	(-5.739)	(-3.391)
Shrcr10	-0.055***	-0.088***
	(-5.011)	(-4.936)
Shr10con	-0.459	-0.429
	(-1.520)	(-0.898)
stkler	0.986	-2.547
	(0.472)	(-0.801)
sai	4.242***	4.313***
	(6.316)	(4.056)
_cons	43.886***	34.175***
	(3.736)	(6.746)
Ind	Yes	Yes
Year	Yes	Yes
N	6136	2459
R^2	0.304	0.332

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

As may be seen, the outcomes support the earlier analyses. In light of the endogeneity issue, the hypothesis in this work remains valid.

4.6 Robustness test

In this part, we tested the robustness of our model by substituting the growth rate of R&D people (RDG) for RDR as the dependent variable. The following table 9 displays the test's findings for robustness.

Table 9. Robustness test

	(1) RDEG	(2) RDEG	(3) RDEG
Fin	-0.008***	-0.008***	-0.008***
	(-2.591)	(-2.730)	(-2.623)
opprofit_pro		-0.002	-0.001
		(-1.089)	(-0.976)
ROA_A		0.204	0.043
		(0.610)	(0.131)
EPS_b		0.067***	0.076***
		(3.074)	(3.435)
SOE		-0.027	-0.020
		(-1.636)	(-1.155)
Shrcr10		0.001	0.001**
		(1.543)	(1.984)
Shr10con		-0.032**	-0.031**
		(-2.362)	(-2.312)
stkler		0.314**	0.344**
		(2.151)	(2.341)
sai		0.005	-0.021
		(0.162)	(-0.666)
_cons	0.170***	0.178	-0.165
	(7.078)	(1.359)	(-1.073)
Ind	No	No	Yes
Year	No	No	Yes
N	4756	4756	4756
R^2	0.001	0.019	0.032

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

As can be seen, the findings support what was said above, proving that the paper's central hypothesis is sound.

5 Conclusion

Using A-share listed manufacturing businesses from 2010 to 2020 as samples, this research empirically investigates whether the intensity of corporate financialization influences the investment in innovation talent. The major findings make it very evident that as businesses move from the actual economy to the virtual economy, there will be a decline in the demand for creative people. The results are still significant after robustness and endogeneity tests. Such empirical findings undoubtedly raise the alarm for us that innovation-driven development is a strategic objective and that businesses cannot develop, and society cannot advance without the impetus of innovative talent. However, enterprises'excessive financialization behavior will adversely affect the growth and development of innovative talent. Therefore, businesses must allocate financial resources responsibly and refrain from harming industrial progress in the quest for short-term gains.

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