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Innovation Input, Enterprise Type and Operating Profit

-- A Case Study of Enterprise Samples in ZhongGuanCun Demonstration Zone

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Abstract: The national development strategy requires enterprises to take technological innovation as a tool to realize the transformation and upgrading of industrial structure and the transformation of development mode. Technological innovation is not only a weapon for enterprises to improve their competitive strength, but also a key means to stabilize themselves in the complex and severe living environment. High-tech enterprises are the key to improve the national innovation level. The performance of innovation input-output of different types of high-tech enterprises is different, which should be analyzed concretely. In order to explore the strongest driving force of enterprise technological innovation and analyze the effective input mode of enterprise technological innovation output maximization, this paper studies the micro data of enterprises in zhongguancun demonstration zone from 2009 to 2016 as samples. The research finds that: There is a significant positive correlation between innovation input and business profit growth. Second, the type of enterprise plays a moderating role in the relationship between independent innovation input and operating profit, but not in the relationship between government innovation input and operating profit.

Keywords: Innovation Input, Operating Profit, Enterprise Type.

1. Introduction

Compared with enterprises' own investment, which method can better stimulate enterprises' technological innovation, maximize the output of technological innovation and improve operating profits? Is the performance of different types of enterprises in response to different types of innovation input consistent? In the complex background of global scientific and technological innovation boom and industrial environment turbulence, faced with the domestic economic downturn crisis, supply-side reform and transformation and upgrading of multiple pressures, enterprises are facing difficult development and promising prospects. In the complex and changeable market environment, enterprises not only pursue economic benefits as the purpose, but also pay more attention to the quality of enterprise development, realize the fundamental transformation from factor advantage competition to innovation advantage competition, and consolidate the sustainable development and operating profit improvement based on technological innovation.

However, the relationship between the government's financial support for enterprise innovation and enterprise's independent investment and the improvement of enterprise's technological innovation level and enterprise profit is not clear. Exploring how different types of innovation input enhance the level of technological innovation of enterprises and stimulate the driving force of technological innovation of enterprises to achieve the improvement of corporate profits is not only of great significance for understanding how to effectively activate the innovation and reform of enterprises to achieve the improvement of economic efficiency and competitiveness, but also for depicting the differences in the path of regional and industrial structure upgrading when the same input.

Technological innovation is closely related to the improvement of enterprise operating profit. Technological innovation is one of the main forms of innovation and an effective means to improve the level of innovation drive. Technological innovation plays an important role in enhancing the competitive advantage and comprehensive strength of enterprises and ensuring the sustainability of enterprises. The development of enterprises relying on technological innovation essentially transforms science and technology into the main driving force of enterprise development. Different from non-high-tech enterprises, the operating profit of high-tech enterprises derives from the level of technological innovation, and the role of technological innovation in the development of high-tech enterprises and the significance of enterprise survival and profit improvement are more obvious. The growth process of high-tech enterprises is more dependent on its technological innovation, and it faces more complex market environment, greater competitive pressure and more cruel elimination test than ordinary enterprises. It is not difficult to see that the research on the relationship between technological innovation input and operating profit has important theoretical and practical significance for the survival and development of enterprises.

Can the funding support of different subjects bring equal efficiency of technological innovation for different types of enterprises, and thus increase operating profit? Taking Zhongguancun National Independent Innovation Demonstration Zone (hereinafter referred to as "Zhongguancun Demonstration Zone") as the empirical research object, this paper analyzes the influence of technological innovation of different types of enterprises on operating profit output under the condition of different subjects of government funds input and enterprises' own input, in order to explore the clear relationship between technological innovation and the improvement of enterprise operating profit. In order to improve the technological innovation ability of enterprises, enhance the viability of enterprises and reduce the survival risk under the complex

environment of economic development at the present stage, the government and the enterprises themselves to support technological innovation put forward a beneficial basis.

2. Literature Review and Hypothesis Development

2.1. Literature Review

The traditional growth theory, based on the macro perspective, regards technological innovation as the power source and important tool of economic growth and social progress. At the end of last century, Chinese researchers raised a great enthusiasm for exploration of technology innovation, and gave their own definitions of technology innovation according to their understanding of the stage characteristics of technological innovation achievements, source and output of technological innovation, purpose, objective, means and process of technological innovation [1,2]. Tang et al. (2014) believe that technological innovation achieves technological progress by improving total factor productivity, and technological progress promotes the transformation of economic growth mode [3]. However, due to the existence of path dependence, opportunity cost and reverse spillover effect of technology introduction, technological innovation and economic growth are not absolute causality, and the former is not sufficient and necessary condition of the latter [4]. The empirical research results of Li and Zhou (2018) show that regional credit and technological innovation have spatial spillover effects, both of which change in the same direction as economic growth, but their crossover or fusion will inhibit economic growth, and there are spatial differences and spatial correlations among different provinces [5]. It is not difficult to see that although the research perspectives are different, researchers basically have unified conclusions on the positive effect of technological innovation on economic growth.

From the micro level, with the improvement of innovation consciousness, academia and entrepreneurs increasingly realize the close relationship between technological innovation input and enterprise performance, and focus more on the exploration of the relationship between the two. Lu (2011) analyzed the influencing factors of industrial innovation and found that the intensity of government support and the characteristics of enterprises have positive and negative effects on innovation performance respectively [6]. Zhu et al. (2014) empirically analyzed the synergistic effect of innovation input and CSR on corporate financial performance of Chinese high-tech enterprises from 2009 to 2011, and the results showed that corporate innovation input not only had a strong positive impact on performance, but also had a significant moderating effect on the positive relationship between CSR and long-term financial performance [7].

Liu and Wang (2019) used the SFA method to test the differences in the impact of government support and R&D management on the efficiency of technological innovation, and concluded that the short-term direct support is more conducive to improving the efficiency of technological innovation of enterprises than the long-term direct support [8]. Ren and Sun (2019) analyzed the differentiation between technological innovation input and enterprise performance under different degrees of internationalization and found that not only the degree of internationalization has a significant moderating effect on the relationship between them, but also the interaction between internationalization and innovation input has a significant difference on the performance effect of different types of enterprises [9]. According to the research of Sun and Huang (2013), the positive relationship between R&D expenditure and performance is the most obvious in small and medium-sized enterprises [10]. Existing studies have shown that innovation input may not necessarily bring absolute performance improvement, which provides some space for exploring the differences in performance brought by different types of input.

Different industry characteristics and enterprise characteristics lead to significant differences in the effective output brought by innovation input, which is also reflected in the different sensitivity of enterprises to different types of input. From the perspective of input-output, enterprise technological innovation can be measured by R&D intensity and total factor productivity, while enterprise performance is one of the intuitive quantitative indicators of enterprise survival [11]. In the empirical studies on high-tech industries and enterprises, researchers have also noted that differences in R&D behaviors to achieve technological innovation lead to differences in enterprise performance, which is reflected in the reverse change of technological innovation and the threshold affecting performance [12]. Liu et al. (2019) proved in their research that, due to the differences in industries, enterprises in different industries have different performances in terms of output and performance caused by different types of R&D investment, and the results show that enterprise size and government investment have opposite conclusions for different industries[13]. The study of An et al. (2009) described the reliable basis for identifying the real innovation signals of enterprises in the case of government subsidies [14]. Cao and Su(2012) took typical Chinese high-tech industries from 1995 to 2008 as samples and concluded that both R&D input and non-R&D input can improve innovation performance, but high output may not be achieved due to industrial differences [15].

To sum up, existing researches have systematically explored the basic content of technological innovation, the relationship between technological innovation input and performance, and the relationship between government innovation support and enterprise performance. However, researches on the relationship between different subject input and enterprise performance, as well as the differences between different types of enterprises in the relationship are not in-depth. This paper intends to investigate the specific relationship between government and enterprises' different inputs and operating profits, as well as the regulatory role of different types of enterprises.

2.2. Research Hypotheses

According to the basic viewpoint of enterprise evolution theory, enterprises obey the basic law of "survival of the fittest" in the industry. Technological innovation is the key to the survival of high-tech enterprises. It is an important concept related to economic operation, market development, industry and enterprise. It is of great significance to improve the viability of enterprises. Technological innovation is one of the main ways to enhance the competitiveness of enterprises and realize the transformation of industrial innovation mode. Enterprises are the main body to bear the profit and loss of technological innovation, and technological innovation has a positive relationship with enterprise performance [17-19].

Technological innovation is the dominant factor for the

competitiveness and survival of enterprises. Specifically, the effective scale of technological innovation input can reduce the development cost of enterprises and improve the operating profit of enterprises through economies of scale. At the same time, benefiting from the strategic measures of enterprises and the combined action of institutions and social forces, technological innovation behavior will produce network effects on enterprise behavior [20-25]. Existing studies have found that enterprises with active innovation behavior, especially those with high R&D personnel and financial investment intensity, are more capable of taking risks and coping with crises in the process of enterprise development. Compared with enterprises with inactive innovation behaviors, the former has more survival advantages [26]. The positive learning model's test results on the relationship between R&D investment, firm survival possibility and firm performance further verified the above conclusions. Therefore, we proposed the following hypothesis:

H1: Innovation input is positively correlated with operating profit.

The theory of firm heterogeneity shows that the characteristics of firms lead to significant differences in the results of receiving and coping with internal and external innovation support. Different types of enterprises have fundamental differences in asset scale, development path, activity, market position and so on. Compared with large enterprises, small and micro enterprises are more difficult to control industry-leading technologies and are at a disadvantage in technological innovation. In addition, there is a significant difference in innovation input between the government and enterprises, whether it is due to the strategic planning of enterprises themselves or the consideration of the government's long-term marketization process. Therefore, the following hypotheses are proposed:

H2: Firm type has a moderating effect on the relationship between innovation input and operating profit. In other words, when the enterprise is large, its own innovation investment can bring significant increase in operating profit. In the case of non-large enterprises, the increase of innovation input cannot directly and significantly improve the operating profit of enterprises.

H3: There is no moderating effect of firm type on the relationship between government innovation input and operating profit.

3. Method

3.1. Sample Selection and Data Source

In this study, secondary data are used for quantitative analysis. In consideration of research needs, panel data of enterprises from 2009 to 2016 are selected as samples. Data was obtained from National Bureau of Statistics (www.stats.gov.cn), Beijing Municipal Bureau of Statistics (www.bjstats.gov.cn), China High-tech Industry Statistical Yearbook (2007-2016), and Zhongguancun National Independent Innovation Demonstration Zone. As the official survey data, it has the characteristics of reliability and validity, and provides good data support for the comprehensive analysis of the relationship between technological innovation, industry shock and the survival of high-tech enterprises. Due to problems such as statistical errors and differences in statistical caliber, samples with missing values were removed and interpolated in the process of data processing, and 63,579 samples of enterprises were obtained.

3.2. Variable Definition and Model Setting

Independent Variable. In this paper, innovation INPUT is selected as the independent variable to measure the main body of R&D investment used for enterprise innovation. This variable is a dummy variable, and the type of investment is determined by comparing the significance of the coefficient after the regression of the government's R&D investment and the enterprise's internal R&D investment and operating profit. Input types include government input (GIP), enterprise input (EIP) and comprehensive input (AIP).

Dependent variable. Enterprise operating profit rate (OPR) is selected as the dependent variable, which is mainly used to describe the stable profit ability and level of high-tech enterprises in a certain period. The formula is as follows:

$$OPR = （OP/OI） * 100\% \quad (1)$$

Where, OPR is the operating profit rate of enterprises, OP is the operating profit of enterprises, OI is the operating income of enterprises, and OPR is the ratio of the two, whose connotation is the proportion of the profit brought by the business of high-tech enterprises in the total operating income of enterprises.

Moderator Variable. Enterprise TYPE is selected as the regulating variable, and this variable is the dummy variable. Enterprise types are large (BT), medium (MT), small (ST) and micro (MIT), which are used to divide enterprise scale differences.

Control variables. In addition to the inevitable correlation with the input, the operating profit of the enterprise is also closely related to the number of scientific and technological personnel (RDR), whether to join the domestic and foreign industry association (IC) or industry alliance (IU). Among them, the scientific and technological activity personnel is measured by the number of scientific and technological activity personnel of the enterprise; Whether to join domestic and foreign trade associations is the dummy variable, if to join domestic and foreign trade associations is 1, otherwise it is 0; Whether to join the domestic and foreign industry alliances is the dummy variable. If joining the domestic and foreign industry alliances is 1, otherwise it is 0.

4. Results

4.1. Descriptive Statistical Analysis

To determine the difference between different input types, the samples were tested. The results show that compared with the mean value of government input and enterprise's own input (198.28), the standard deviation value of enterprise's own input (EIP) is 8265.81, and the mean value of enterprise input (GIP) is 160.30, indicating that compared with the government, the overall level of enterprise's independent innovation input is higher. This is consistent with the characteristics of high-tech enterprises focusing on technological innovation. The T-value test results were 34.98 and 8.67, respectively. At the significance level of 0.05, the test results were all significant, rejecting the null hypothesis, that is, both of them were different from the average level of fund input. To a certain extent, it indicated that there was a significant difference in innovation input between enterprises, which was consistent with the hypothesis.

The sample interval was set as 63,579 samples of enterprises in Zhongguancun Demonstration Zone from 2011

to 2016 after eliminating, interpolating and shrinking the tail. The correlation test results of enterprise sample indicators are shown in Table 2. The results show that enterprises' own innovation input is significantly positively correlated with government innovation input. Meanwhile, government innovation input is also significantly positively correlated with the number of scientific and technological personnel. This is consistent with the reality. The relationship between enterprise innovation input and the number of scientific and technological personnel employed by enterprises is closer than that between government innovation input and the number of scientific and technological personnel employed by enterprises. The significant positive correlation between enterprise's own innovation input and government's innovation input indicates that sufficient enterprise's own innovation input will "attract" the support of government input. Both the enterprise's own innovation input and the government's innovation input are significantly correlated with operating profit, and it is basically concluded that innovation input will promote the improvement of operating profit, which is consistent with the hypothesis.

Table 1. The difference between the two inputs

	T-test = 198.28				
	t	Sig.	M.D.	95%CI	
				Lower	Upper
EIP	34.980	0．000	8265.810	7802.710	8728.900
GIP	8.670	0.000	160.300	124.050	196.540

Table 2. Descriptive statistical analysis

	EIP	GIP	RDR	OPR
EIP	1			
	(0.000)			
GIP	.166**	1		
	(0.000)	(0.000)		
RDR	.739**	.163**	1	
	(0.000)	(0.000)	(0.000)	
OPR	.030**	.012**	.036**	1
	(0.000)	(0.004)	(0.000)	（0.000）

4.2. Correlation Analysis

The regression results show that there is a significant positive correlation between innovation input and operating profit, that is, each independent innovation input of 10 ,000 yuan can increase operating profit of 71,340 yuan. There is a significant negative correlation between government innovation input and operating profit, that is, per enable. If 10,000 is invested in government innovation, the operating profit will decrease by 45,040 yuan. This difference is understood to mean that when enterprises make independent input, they will have greater motivation to promote innovation and transform input into output in a real and direct way. However, when enterprises obtain financial support from the government, they often show weak innovation vitality due to the existence of rent-seeking, and use this part of capital for arbitrage, which can explain the reason why the regression coefficient symbols of the two kinds of innovation investment are different.

Table 3. Regression results among variables

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std.Error	Beta		
(Constant)	216599.406	12606.648		17.181	0.000
EIP	7.134	0.151	0.270	47.159	0.000
GIP	-4.504	1.320	-0.013	-3.412	0.001
RDR	-300.340	52.343	-0.033	-5.738	0.000
IC	-116622.175	17007.996	-0.034	-6.857	0.000
IU	-16404.103	18174.836	-0.005	-0.903	0.367

4.3. The moderating effect of Enterprise Type

In order to observe the different performance of enterprise's own innovation input and government's innovation input in different types of enterprises (large, small, medium and micro), this study separately adds enterprise type into the regression equation of enterprise's own innovation input and government's innovation input and operating profit. The following model is then constructed:

$$OPR=\beta0+\beta1EIP+\beta2RDR+\beta3IC+\beta4IU+\beta5Type+\varepsilon t \quad (2)$$

$$OPR=\beta0+\beta1EIP+\beta2RDR+\beta3IC+\beta4IU+\beta5Type+\beta6\ EIP*Type+\varepsilon t \quad (3)$$

$$OPR=\beta0+\beta1GIP+\beta2RDR+\beta3IC+\beta4IU+\beta5Type+\varepsilon t \quad (4)$$

$$OPR=\beta0+\beta1GIP+\beta2RDR+\beta3IC+\beta4IU+\beta5Type+\beta6\ GIP*Type+\varepsilon t \quad (5)$$

4.3.1. Enterprise Type, independent innovation input and Operating Profit

As shown in Table 4, the original model of operating profit and innovation input of enterprises and the model of

interaction terms between type of joining enterprises (large scale) and innovation input of enterprises are observed. The results show that: First, no matter whether the interaction item is joined or not, the relationship between joining domestic and foreign industry alliances and the operating profit of the enterprise is not significant, which means that joining domestic and foreign industry alliances may bring intangible resources such as knowledge resource sharing and technology collaborative sharing to the enterprise, but the direct manifestation impact on the operating profit of the enterprise is not significant. Second, except IU, the coefficients of the other variables of the two models are significant, in which the enterprise's own innovation input is significantly positively correlated with the operating profit coefficient, the number of enterprise scientific and technological activities is significantly negatively correlated with the operating profit coefficient, and the coefficient of the other index model (2) is improved compared with that of model (1). When the enterprise scale is large, The coefficient between the operating profit and the innovation input of enterprises is significantly increased, indicating that large enterprises will bring more operating profit when their innovation input increases.

Table 4. Independent innovation input and Operating Profit(Large)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	204890.041	12613.790		16.243	0.000
	EIP	7.109	0.151	0.269	47.154	0.000
	RDR	-505.175	54.709	-0.055	-9.234	0.000
	IC	-113374.950	16992.918	-0.033	-6.672	0.000
	IU	-16924.996	18155.015	-0.005	-0.932	0.351
	BT	399840.891	33755.389	0.050	11.845	0.000
2	(Constant)	195733.646	12629.577		15.498	0.000
	EIP	8.947	0.225	0.338	39.712	0.000
	RDR	-515.075	54.666	-0.056	-9.422	0.000
	IC	-106722.028	16987.818	-0.031	-6.282	0.000
	IU	-22116.969	18144.171	-0.006	-1.219	0.223
	BT	483515.094	34575.523	0.061	13.984	0.000
	EIP * BT	-2.571	0.234	-0.084	-10.970	0.000

As shown in Table 5, the original model of enterprise operating profit and its own innovation input and the model of the interaction term between the type of enterprise joining (medium-sized) and its own innovation input are observed. The results show that: first, the response of medium-sized enterprises and large enterprises is the same regardless of whether they join the interaction term or not, that is, whether they join the domestic and foreign industry alliances does not directly improve the operating profit of enterprises. Second, the coefficients of other variables in the two models are significant except IU, but the comparison coefficient results show that the addition of adjustment variables does not significantly improve the operating profit of the innovation input of medium-sized enterprises, which is different from the response of large enterprises.

Table 5. Independent innovation input and Operating Profit(Medium)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	216214.253	12793.448		16.900	0.000
	EIP	7.096	0.151	0.268	46.999	0.000
	RDR	-308.834	52.403	-0.034	-5.893	0.000
	IC	-117238.217	17054.395	-0.034	-6.874	0.000
	IU	-14822.688	18217.967	-0.004	-0.814	0.416
	MT	-9852.602	17757.029	-0.002	-0.555	0.579
2	(Constant)	215527.383	12790.011		16.851	0.000
	EIP	7.216	0.152	0.273	47.433	0.000
	RDR	-307.586	52.387	-0.034	-5.871	0.000
	IC	-116827.449	17049.320	-0.034	-6.852	0.000
	IU	-15535.735	18212.764	-0.004	-0.853	0.394
	MT	41922.976	19557.848	0.009	2.144	0.032
	COMPUTE EIPMT=EIP * MT	-3.467	0.550	-0.027	-6.307	0.000

As shown in table 4 to 6, enterprise operating profit and own innovation into the original model and to join the enterprise type (small) and their innovation investment interaction model, the result shows: the first, whether at home and abroad to join trade unions did not bring significant operating profit increase for small businesses; Second, the coefficients of other variables in the two models are significant except IU, but the comparison coefficient results show that the addition of adjustment variables does not significantly improve the operating profit of small enterprises' own innovation input, which is different from the response of large enterprises, but consistent with the conclusion of medium-sized enterprises.

Table 6. Independent innovation input and Operating Profit(Small)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	263033.934	13824.008		19.027	0.000
	EIP	7.098	0.151	0.268	47.056	0.000
	RDR	-350.262	52.432	-0.038	-6.680	0.000
	IC	-115096.397	17000.936	-0.034	-6.770	0.000
	IU	-8971.670	18181.147	-0.002	-.493	0.622
	ST	-103128.822	12244.038	-0.033	-8.423	0.000
2	(Constant)	262939.988	13823.227		19.022	0.000
	EIP	7.144	0.152	0.270	47.109	0.000
	RDR	-357.588	52.489	-0.039	-6.813	0.000
	IC	-117007.804	17012.528	-0.034	-6.878	0.000
	IU	-7376.157	18188.280	-0.002	-0.406	0.685
	ST	-94855.967	12566.852	-0.030	-7.548	0.000
	EIP * ST	-2.935	1.005	-0.012	-2.920	0.004

As shown in Table 7, the coefficients are not significant in the original model of observing the enterprise operating profit and its own innovation input and the model of the interaction term between the type of joining enterprise (micro) and its own innovation input, which means that for micro enterprises, there is no significant relationship between their own innovation input and enterprise operating profit. Combined with the reality, this conclusion is not difficult to understand, and different from other types of enterprises, micro enterprises face more problems of enterprise survival rather than development and improvement. For micro-enterprises, the need to "live" is even more pressing. In addition, in terms of the scale of innovation input and the effect of innovation output, micro-enterprises cannot compete with other types due to the size limitation.

Table 7. Independent innovation input and Operating Profit(Micro)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	210672.813	13572.166		15.522	.000
	EIP	7.096	.151	.268	47.008	0.000
	RDR	-306.240	52.554	-.033	-5.827	.000
	IC	-117460.809	17042.732	-.034	-6.892	.000
	IU	-13801.518	18285.682	-.004	-.755	.450
	MIT	11411.394	13369.306	.003	0.854	.393
2	(Constant)	210567.919	13573.860		15.513	.000
	EIP	7.097	.151	.268	47.010	0.000
	RDR	-306.286	52.554	-.033	-5.828	.000
	IC	-117461.747	17042.832	-.034	-6.892	.000
	IU	-13679.214	18287.419	-.004	-0.748	.454
	MIT	12177.748	13456.590	.004	0.905	.365
	EIP * MIT	-2.685	5.358	-.002	-0.501	.616

In summary, the results of model test can basically support the moderating effect of enterprise type on the relationship between innovation input and operating profit, which is consistent with the hypothesis that when the enterprise is large, its innovation input can bring significant improvement in operating profit. In the case of non-large enterprises, the increase of innovation input cannot directly and significantly improve the operating profit of enterprises.

4.3.2. Enterprise Type, government innovation input and Operating Profit

Table 8. Government innovation input and Operating Profit(Large)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	197557.166	12837.799		15.389	0.000
	GIP	-1.283	1.342	-0.004	-0.956	0.339
	RDR	1321.473	39.683	0.144	33.301	0.000
	IC	-117767.492	17287.154	-0.035	-6.812	0.000
	IU	-14389.392	18471.493	-0.004	-.779	0.436
	BT	392545.311	34427.723	0.049	11.402	0.000
2	(Constant)	197071.293	12842.431		15.345	0.000
	GIP	0.166	1.697	0.000	0.098	0.922
	RDR	1323.933	39.722	0.145	33.330	0.000
	IC	-117457.826	17288.451	-0.034	-6.794	0.000
	IU	-14551.208	18471.720	-0.004	-0.788	0.431
	BT	399983.578	34838.181	0.050	11.481	0.000
	GIP*BT	-3.829	2.745	-0.007	-1.395	0.163

Table 8 to 11 shows the test results of the moderating effect of enterprise type on the relationship between journey

innovation input and operating profit. It is not difficult to see that government innovation input can not significantly and directly improve the operating profit of enterprises of any type, that is to say, compared with the internal driving force, external driving force cannot promote the innovation consciousness and innovation behavior of enterprises, and the innovation behavior and profit improvement brought by the innovation behavior of enterprises are mostly from the internal driving force of enterprises.

Table 9. Government innovation input and Operating Profit(Medium)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	211138.459	13019.469		16.217	0.000
	GIP	-0.115	1.340	0.000	-0.086	0.931
	RDR	1509.526	36.431	0.165	41.435	0.000
	IC	-123112.475	17347.690	-0.036	-7.097	0.000
	IU	-10494.702	18533.933	-0.003	-.566	0.571
	MT	-32460.276	18064.938	-0.007	-1.797	0.072
2	(Constant)	210928.419	13021.257		16.199	0.000
	GIP	1.005	1.765	0.003	0.569	0.569
	RDR	1505.949	36.615	0.164	41.129	0.000
	IC	-122997.084	17348.100	-0.036	-7.090	0.000
	IU	-10583.059	18534.162	-0.003	-0.571	0.568
	MT	-30672.506	18157.787	-0.007	-1.689	0.091
	GIP*MT	-2.628	2.696	-0.005	-0.975	0.330

Table 10. Government innovation input and Operating Profit(Small)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	255353.075	14075.799		18.141	0.000
	GIP	-0.499	1.340	-0.001	-0.373	0.709
	RDR	1466.550	36.595	0.160	40.075	0.000
	IC	-119405.455	17294.227	-0.035	-6.904	0.000
	IU	-6300.962	18496.471	-0.002	-.341	0.733
	ST	-103340.657	12460.265	-0.033	-8.294	0.000
2	(Constant)	255362.702	14075.936		18.142	0.000
	GIP	-0.436	1.355	-0.001	-0.322	0.747
	RDR	1466.494	36.596	0.160	40.073	0.000
	IC	-119449.970	17294.975	-0.035	-6.907	0.000
	IU	-6320.382	18496.714	-0.002	-0.342	0.733
	ST	-102968.885	12520.638	-0.033	-8.224	0.000
	GIP* ST	-2.627	8.671	-0.001	-0.303	0.762

Table 11. Government innovation input and Operating Profit(Micro)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	198423.666	13817.281		14.361	0.000
	GIP	-0.125	1.340	0.000	-0.093	0.926
	RDR	1512.659	36.643	0.165	41.281	0.000
	IC	-122678.690	17336.031	-0.036	-7.077	0.000
	IU	-9341.349	18603.232	-0.003	-.502	0.616
	MIT	22916.672	13603.044	0.007	1.685	0.092
2	(Constant)	198428.558	13817.376		14.361	0.000
	GIP	-0.110	1.341	0.000	-0.082	0.934
	RDR	1512.671	36.643	0.165	41.281	0.000
	IC	-122684.938	17336.151	-0.036	-7.077	0.000
	IU	-9352.326	18603.373	-0.003	-0.503	0.615
	MIT	23200.172	13620.519	0.007	1.703	0.089
	GIP*MIT	-20.569	49.916	-0.002	-0.412	0.680

4.4. Robustness Tests

In order to further prove the conclusion of this study, net profit and profit rate were used to replace the existing profit measurement indicators, and a variety of calculation methods were used to measure the relationship between innovation input and profit, and the adjustment effect of enterprise types was tested. The empirical steps were repeated. After comparing the results, it was found that they were consistent with the conclusions of this paper.

5. Discussion

Based on the full sample data of enterprises in Zhongguancun Demonstration Zone from 2011 to 2016, this paper studies the influence of technological innovation of different types of enterprises on operating profit output under the condition of different subjects of government fund input and enterprise's own input, and describes the moderating effect of enterprise type. The results verify the theoretical hypothesis of this paper. The main conclusions are as follows:

First, for enterprises, innovation capital input does not always bring positive operating profit. Due to the particularity of government innovation capital support, its impact on enterprise operating profit is not positive. On the contrary, the research results show that enterprises' spontaneous and independent innovation input can bring a direct positive increase in operating profit. Different types of innovation input have different influences on operating profit.

Second, as for the relationship between independent innovation input and operating profit, large enterprises can improve their operating profit more quickly and intuitively when independent innovation input increases. The increase of independent innovation input of non-large enterprises can not significantly increase operating profit, that is, the type of enterprises has a moderating effect.

Third, for the relationship between government innovation input and operating profit, no matter what the type of enterprise is, the relationship between the two is not significant, which means that the increase of government innovation input may not be able to directly and truly improve the operating profit of enterprises, that is, there is no moderating effect of enterprise type.

In addition, this paper also proves that whether to join domestic and foreign industry alliances does not significantly affect the change of operating profits of enterprises, but is more reflected in long-term interests and implicit earnings.

However, there are still some limitations in this paper, which are mainly reflected in that when studying the moderating effect of enterprise type, whether it is affected by the industry and main business of the enterprise is not taken into account. The above problems will continue to be improved in the follow-up research.

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