

# Government Intervention, the Development of Regional Finance and the Growth of SMEs

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**Keywords:** Science and technology finance; Small and medium-sized enterprises; Enterprise development; Regional finance; Government Intervention

**Abstract.** This paper is based on the sample of 174 small and medium-sized enterprises listed on China's small and medium-sized board and gem from 2011 to 2015. At the same time, it uses panel data model to empirical test. The results show that the development of regional finance can effectively solve the financing problems of SMEs, and promote the development of enterprises. At the same time, reducing government intervention in enterprise financing, to a certain extent, can further promote the development of SMEs.

## Introduction

As the most active group of innovation in our country, SMEs are playing a more and more important role. However, financing constraints are the most severe constraints to the survival and development of SMEs. Therefore, how to make financial services to the development of enterprises has become the locus of researchers. The relevant research of science and technology finance mainly includes: first, the theoretical definition of the concept of science and technology finance; Second, the role of finance in technological innovation activities of enterprises [1][2][3]; Third, research on the performance and efficiency evaluation of [4][5], mainly adopting AHP [6], DEA [7]. The domestic research on science and technology finance is still in the development stage, although Zhai Huayun and Li Yanru have empirically examined the influence of the development level of regional finance on the financing efficiency of high-tech enterprises [8]. However, the impact on the growth of enterprises has not been discussed in depth. Therefore, in this paper, the 2011-2015 small and medium-sized board, gem companies and their provinces and cities in the technology and financial development panel data as an example, empirical analysis of the dynamic relationship between the two.

## Theoretical Analysis and Research Hypothesis

Fiscal investment in science and technology, enterprise's own capital and social capital are the main factors affecting scientific and technological innovation [9], and there are regional differences in the promotion effect of scientific and technological financial investment. Liu Wei found that SMEs get financing growth relatively fast, venture capital can ease the financing constraints of SMEs, and promote the growth of SMEs [10]. In areas with a relatively high level of development in finance, enterprises are developing faster, especially in high-tech enterprises. Based on the above analysis, we propose the following assumptions:

Hypothesis 1: there is a positive correlation between the development level of regional science and technology finance and the growth of enterprises, and the growth of enterprises is more obvious in the areas of high technology finance development level.

Enterprises tend to expand the scale or R&D investment in endogenous financing, and smaller enterprises and the establishment of a shorter period of time enterprises will have their own accumulation of deficiencies, so this type will be more dependent on external financing. Therefore, this paper puts forward the assumption that:

Hypothesis 2: for small-scale, short-established SMES regional technology and financial development level is more able to promote their growth.

with the development of science and technology finance continues to mature, this role of the government will be weakened[11].Therefore, we believe that in the context of the restructuring of China and the emerging governance environment, the impact of regional technology finance on the financing of small and medium technology enterprises will be weakened by government intervention. In view of this, this paper puts forward the assumption:

Hypothesis 3: the level of government intervention will significantly reduce the impact of the level of technological and financial development on the growth of enterprises.

## Research And Design

### Sample Selection and Data sources.

This paper selects 174 small and medium-sized enterprises and GEMs listed on the Shenzhen Exchange, and basically meets the standards of 174 technology-based enterprises. The data used in this paper are from China Science and Technology Statistical Yearbook, China's Major Scientific and Technological Indicators Database and China High-tech Industry Statistical Yearbook. The government intervention index comes from Fan Gang, Wang Xiaolu and Zhu Hengpeng's China Marketization Index: by region. The Market-Oriented Relative Process Report (2006-2011) reduces government-to-business interventions, and financial data is derived from the CSMAR database. In order to remove the bias caused by the outliers on the regression results, all numerical variables were removed using the Winsor method to remove 1% of the observations before and after.

### Definition of Variables.

Specific definitions of the relevant variables and their measurement criteria are shown in table 1.

Table 1 Variable Definitions

Variable	Definition
GROWTH	The growth of enterprise, choosing the index of enterprise development ability to measure
LEVEL	The development level of regional finance is measured by the weighted arithmetic average of the level of science and technology finance resources, science and technology finance funds, science and technology finance output and science and technology finance loans.
GOV	Government intervention Index, as measured by the reduced Government intervention Index in the China Market-oriented Index: a report on the relative Progress of Regional marketization
CF	The cash flow of an enterprise is measured by dividing the net flow of business activities by the total assets
OPP	The investment opportunity of an enterprise, as measured by the market value of the enterprise divided by its total assets
SIZE	Business size, measured by the natural logarithm of total assets
WAY	The way a business is financed, measured by the division of its responsibility by its total assets
FIRST	The largest shareholder's shareholding ratio
AGE	The length of time a company has been listed on the market
GDP	Regional GDP growth rate
YEAR	Annual control variable
INDUSTRY	Industry control variable

### Models Building.

In order to test the relationship between the development level of regional science, technology and finance and the level of enterprise development, model 1:

$$GROWTH_i = \alpha_0 + \alpha_1 LEVEL_i + \alpha_2 LEVEL_i * SIZE_i + \alpha_3 LEVEL_i * AGE_i + \alpha_4 CF_i + \alpha_5 OPP_i + \alpha_6 SIZE_i + \alpha_7 WAY_i + \alpha_8 QUALITY_i + \alpha_9 FIRST_i + \alpha_{10} AGE_i + \alpha_{11} GDP_i + \alpha_{12} YEAR_i + \alpha_{13} INDUSTRY_i + \varepsilon_i \quad (1)$$

In order to examine the influence of government intervention on the development level of regional science and technology finance and the relationship between the growth of small and medium-sized enterprises, model 2:

$$GROWTH_i = \alpha_0 + \alpha_1 LEVEL_i + \alpha_2 GOV_i + \alpha_3 GOV_i * LEVEL_i + \alpha_4 CF_i + \alpha_5 OPP_i + \alpha_6 SIZE_i + \alpha_7 WAY_i + \alpha_8 QUALITY_i + \alpha_9 FIRST_i + \alpha_{10} AGE_i + \alpha_{11} GDP_i + \alpha_{12} YEAR_i + \alpha_{13} INDUSTRY_i + \varepsilon_i \quad (2)$$

## Empirical Analysis

### Descriptive Statistics.

Table 2 shows descriptive statistics of variables. Table 3 is the correlation coefficient between the variables, the lower left is the Pearson correlation coefficient. The level of regional science and technology finance (LEVEL) is significantly positively correlated with corporate growth (GROWTH). The government intervention index (GOV) and corporate growth (GROWTH) also have a significant positive correlation, indicating that the higher the level of regional science and technology finance development, the reduction Government intervention in the market, The higher the growth of small and medium-sized technology companies in the region although the correlation coefficient between the variables is significant, but not more than 0.5, therefore, there is no multiple collinearity between the explanatory variables, suitable for further regression analysis.

Table 2 descriptive statistics of variables

Variables	N	Mean	Median	Minimum	Maximum	Std.Dev
GROWTH	870	1.5794	2.5582	-5.5541	5.4596	2.5589
LEVEL	870	0.4557	0.4234	0.2306	0.8367	0.2265
GOV	870	8.3418	7.8	2.17	12.67	3.4554
CF	870	0.0532	0.0485	-0.4008	0.4711	0.0777
OPP	870	2.2837	1.7218	-1.2256	15.5465	1.9613
SIZE	870	21.7396	21.6261	18.6655	26.9987	1.2765
way	870	0.5321	0.4852	0.3321	0.8012	1.2898
FIRST	870	0.3483	0.3372	0.0388	0.8383	0.1463
AGE	870	10.2619	10	5	18	4.4262
GDP	870	0.1538	0.1515	0.0059	1.8317	0.1115

Table 3 correlation coefficients between variables

Variables	GRO	LEVE	GOV	CF	OPP	SIZE	WAY	FIRST	AGE	GDP
GRO										
LEV	0.052**									
GOV	0.101**	0.338**								
CF	0.318**	0.4011	0.0228							
OPP	-0.222*	0.3501	-0.0198	0.187**						
SIZE	0.064**	0.125**	0.0217	0.2598*	-					
WAY	-0.041*	-0.124*	-0.0201	-0.3098	0.0496*	0.4723*	-0.379			
FIRS	0.0018	0.165**	0.0782	0.0009	0.201**	-0.069	0.003			
AGE	-0.044*	-0.0496	-0.0873	-0.0626	0.2105	-0.473	0.321	0.077		
GDP	-0.095*	-0.095*	-0.3987	-0.0197	-0.05**	0.011*	0.037	0.049	-0.009	

### The Regression Result of Science and Technology Finance and Enterprise growth.

The impact of technology finance on the growth of small and medium-sized technology enterprises is shown in table 4. Comparing the regression results of class I, class III and class III, we can see that there is a significant positive correlation between the level of science and technology finance and the growth of enterprises. At the same time, the relationship is more significant in the areas of high-tech finance level, which verifies hypothesis 1. From the regression results of the interactive items between the development level of regional science, technology and finance and the scale of enterprises, it can be seen that the coefficient of the interactive items is negative, but not significant. The regression coefficient of the interactive items between the level of regional scientific, technological and financial development and the years of listing is significantly negative. Hypothesis 2 is partially confirmed.

Table 4 Model 1 regression results

Variables	Full sample	Groups		
		<i>I</i>	<i>II</i>	<i>III</i>
CONSTANT	0.0879***	0.0793***	0.785***	0.964***
LEVEL	0.0017**	0.0031**	0.0019***	0.0011**
LEVEL*SIZE	-0.0001	-0.0001	-0.0002	-0.0001
LEVEL*AGE	-0.0001***	-0.0003***	-0.0001*	-0.0002***
CF	0.1354***	0.1741***	0.1296**	0.1459**
OPP	-0.0201***	-0.0154***	-0.0019***	-0.0247***
SIZE	0.0025**	0.0017**	0.0029*	0.0031**
WAY	-0.0009***	-0.0013***	-0.0007***	-0.0006***
FIRST	-0.0074	-0.0069	-0.0078	-0.007
AGE	0.0031***	0.0028***	0.0029***	0.0032***
GDP	-0.0713***	-0.0601***	-0.0712***	-0.0811***
INDUSTRY	Control	Control	Control	Control
YEAR	Control	Control	Control	Control
$R^2$	0.155	0.121	0.130	0.159
F	13.586	14.264	14.915	18.639

In the regression model of table 5, the interaction between government intervention index and the development level of finance is added. According to the results of table 5, the regression coefficient between government intervention index (GOV) and the growth of SMEs is significantly positive. The correlation coefficient between the government intervention index and the development level of regional finance is significantly positive, and hypothesis 3 is confirmed.

Table 5 Model 2 Regression Results

Variables	Full sample	Groups		
		<i>I</i>	<i>II</i>	<i>III</i>
CONSTANT	0.0683***	0.0727***	0.0621***	0.0697***
LEVEL	0.0002*	0.0004**	0.0002**	0.0001*
GOV	0.0031***	0.0052*	0.0032***	0.0021**
LEVEL*GOV	0.0002*	0.0003**	0.00002**	0.0002**
CF	0.1626***	0.1592**	0.1856**	0.1912***
OPP	-0.0052***	-0.0047***	-0.0063***	-0.0045***
SIZE	0.0037*	0.0021**	0.0035*	0.0032*
WAY	-0.0009***	-0.0017***	-0.0008***	-0.0014**
FIRST	-0.0212	-0.0226	0.0231	0.0019**
AGE	-0.0003	-0.0012	-0.0001	-0.0004
GDP	-0.0546***	-0.0621***	-0.0479**	-0.0226**
INDUSTRY	Control	Control	Control	Control
YEAR	Control	Control	Control	Control
$R^2$	0.0875	0.0882	0.0896	0.0812
F	18.7639	19.1238	17.6366	12.2325

## Conclusion

Based on the data of China's small and medium-sized technology companies in 2011-2015, this paper combines the institutional environment of science and technology finance in various regions of China to empirically test the impact of regional science and technology finance development on the growth of small and medium-sized technology enterprises. The study finds that with the progress of China's science and technology finance integration, the development of regional science and technology finance is conducive to the growth of small and medium-sized technology enterprises, and this positive effect is more obvious for small and medium-sized technology enterprises with short listing times. In addition, after further entering the government intervention index, it was found

that government intervention would hinder the positive development of regional science and technology finance development for small and medium-sized technology enterprises. The research enlightenment of this paper is: technological innovation is the core element of the development of small and medium-sized technology enterprises. The development of regional science and technology finance can enable small and medium-sized technology enterprises to raise funds at low cost, and will effectively use the funds for financing for technological innovation, thereby raising funds. The use efficiency, provide more growth opportunities, and promote the development of small and medium-sized technology companies. Based on the above conclusions, the relevant policy recommendations for the construction of China's science and technology financial system are proposed: (1) Reducing the degree of government intervention in corporate finance, changing the practice of setting up a company to directly operate technology finance business, following the principle of equal support for the development of science and technology financial entities, and compensating for financial credits of financial institutions to compensate for cost losses. Incentive financial institutions to carry out science and technology credit, and should carry out scientific and financial information services. (2) Improve the securities market management mechanism, promote the development of the securities market, create favorable conditions for financing small and medium-sized technology enterprises, and realize the effective allocation of financial resources.

## Acknowledgment

The author is grateful to Liu Na for her support throughout the process of writing this paper. The author also thank Wu Yingyi for his assistance, thanks for his support in the bibliometric analysis, and comments on an earlier version of this paper

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