

Political Connection, Diversification Strategy and R&D Investment of Enterprise--Analysis on Panel Data from Chinese Private Listed Companies

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Abstract—The research about the political connection and R&D investment has been a key position in the field of business management. This paper combs the internal mechanism and effects of the relationship between the political connection, diversification strategy and enterprise's R&D investment as well as forms the multi-level study system of the impact of political connection to enterprise R&D investment. And then an empirical test about how political connection affects the enterprise's R&D investment is taken from the samples including some enterprises which are small and medium-size (SME) board listed companies in Shenzhen from 2009 to 2012. The main conclusions are as follows: Firstly, we find that the relationship between political connection and R&D investment displays “U” type, that is to say, within certain limits, political connection has a negative impact on R&D investment, but more than a certain value, the political connection positively influences the R&D investment; Secondly, compared to no diversified strategy enterprises, political connection has a more negative effect on R&D investment in diversified strategy enterprises. Further, compared to the implementation of the unrelated diversification, the political association has a more negative impact on R&D investment in the implementation of related diversification enterprises.

Index Terms—Political connection, Diversification strategy, R&D investment

I. INTRODUCTION

Since the reform and opening-up, China has begun to turn to market economy from the planned economy. Through more than 30 years of development, China has become the world's second largest economy and achieved remarkable development with its rapidly growing economy. Du Xingqiang (2012) believed that, although the growth rate of China's GDP gross always remained at about 9% during the reform and opening-up progress, the

fact hidden behind the high growth is that China's economy seriously relies on the factor inputs, has the typical characteristics of extensive mode of high input, high energy consumption and low efficiency, the industries with low technical content take up a large part of China's GDP. In 2015, R&D expenditures in our country were RMB 1422 billion, increasing by 9.2% compared with last year, the proportion of which in GDP was 2.10%, while in western developed countries, R&D investment that enterprises use spontaneously for technical innovation takes up about 3-5% in GDP, which indicates that there exists quite a gap between spontaneous R&D investment of Chinese enterprises and the one of the developed countries. The proportion of R&D investment of Chinese enterprises in GDP is less, because most of enterprises in our country are engaged in the production chain with low additional value to some extent. The enterprises that are not developed positively will have many problems naturally and stay at the state of “Fire Fighting”, and the senior management will certainly not concentrate their efforts on investment in research and development; therefore, the enthusiasm of enterprise to make investment in research and development will be decreased. And the private enterprises are lack of investment in research and development, which indirectly restricts the improvement of the technical innovation level of our country, and enters in a vicious circle. What reasons reduced the enthusiasm of enterprise to make investment in research and development?

This article will discuss from the perspective of political connection. Specifically speaking, we take the listed private enterprises which belong to small and medium enterprise board of Shenzhen Stock Exchange from 2009-2012 as example, to discuss the influence of political connection of private enterprises on R&D investment expenditure of enterprises, and investigate the differences of specific influences of the political connection of private enterprises that respectively implement related diversification strategy and unrelated

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diversification strategy on the R&D investment through subdividing the dimensionality of diversification strategy.

II. THEORETICAL ANALYSIS AND RESEARCH

A. Political connection and R&D investment of enterprise

Formerly, the scholars believed that, in R&D investment of enterprise, the political connection of senior executives were helpful to let enterprises to obtain the resources to work on research and development activities at lower costs, reduce the threshold for enterprises to carry out research and development activities, and guarantee the research and development activities to be conducted smoothly, and thus promote the enterprises to participate in innovation activities positively (Ding Zhen, 2010; Xu Xuexia, Li Weiwen et al. 2013); and meanwhile, it is also conducive for enterprises to get more protection in law, for example, the protection for property right and contractual right reduced the risk of investment in research and development and protect the benefit of research and development achievement owned by the company solely (Xue Yue, 2014). On the perspective of marketization, at the regions with lower marketization degree, the political connection of senior executives also played a greater role in promoting the R&D expenditures of enterprise (Jiang Yawen, Huangyan and Xu Wen, 2012). On the aspect of enterprise technology innovation, as the technology development has great uncertainty and difficulty to predict, and the amount of investment is larger, R&D investment of enterprises not only need a large amount of resources, but also require entrepreneurs to make effective decision. In this way, the enterprises can effectively implement technical innovation effectively. Therefore, if the senior executives of enterprises want to make investment in research and development, they need to continuously acquire various kinds of useful policy information, industry knowledge and other resources from inside and outside of enterprises. From the perspective of the resource-based view, the higher the political connection of enterprise become, the entrepreneur will be able to develop much more social connection, have more channels to get effective information, own stronger ability to acquire resources, and make more effective decision of technical innovation.

However, we find through studies that, the political connection of enterprises has the feature of bi-direction, which shows that the enterprises acquire important governmental resources and protection, and control enterprises to achieve their political objectives through political connection. Therefore, political connection may have negative effect on R&D investment of enterprises. Taking private enterprises for example, the entrepreneurs usually acquire political connection actively through running for NPC members or CPPCC members, and thus bring tax preference, financing convenience, policy information and market admittance for companies, and also can obtain more powerful property right protection, however, political connection also bring some negative effective while bringing much benefits: on one hand, establishing and maintaining political connection requires

huge costs and consumes large amounts of resources of enterprises (Yang Qijing, 2011); the financial consumption will have crowding-out effect on research and development expenditure scale of enterprises; a large amount of time and energy consumption will suppress the initiative spirit of entrepreneurs and thus reduce the research and development expenditure (Li Shitian, and Qiu Weinian, 2015). And meanwhile, political connection will make enterprises accept excessive administrative intervention from government, and thus the enterprise is unable to make decision independently, for example, enterprises are forced to expand employment scale when they do not need more employees, which increases the operation cost of enterprise, reduces enterprise performance and cause the reduction of R&D investment of enterprise; on the other hand, the political connection may bring short-term interest to enterprises, but it may be at the cost of sacrificing long-term development. Specifically, after utilizing the political connection assets to acquire the advantages of policy, information and fund required for the enterprise development, the private entrepreneurs of our country usually select the projects with low operation risk, market stability and quick payoffs, are unwilling to be engaged in technological innovation projects with high risk, long R&D investment cycle and uncertain market, which will cause the private enterprises that own political connection assets generally will not be highly enthusiastic for R&D investment.

Based on the above analysis, this article proposes the following assumptions:

Assumption 1: compared to the enterprises without political connection, the R&D investment strength of the enterprises with political connection will be less.

Assumption 2: if the private enterprises own more powerful political connection assets, the R&D investment strength of the enterprises will be less.

B. Political connection and R&D investment of enterprises: diversification strategy

For the studies on political connection and R&D investment behavior of enterprises, it is possible to try to construct the frame in which the strategy factor is used as the regulation variable and thus affect "resource-performance" according to the resource-based view. Lijian et al. (2012) believed that, the political connection of entrepreneurs had relation with the competitive strategy of enterprises on the commercial level, the differentiation strategy and low-cost strategy has obvious mediating effect on the relationship between the political connection of entrepreneurs and the enterprise value. Zhang Min et al. (2009) found that the diversification strategy and political connection play an obvious interaction role in the operational risk of enterprises through the studies on the perspective of diversification strategy and operational risk. According to the theories of resource-based view, the resources can be transformed to be the productivity of enterprises and improve the performance of enterprise better through effective strategic allocation. Therefore, the implementation of diversification strategy will indeed affect the relation between political connection and R&D

investment behavior of enterprise. And meanwhile, as the government of our country plays an important role in resource allocation, the category of the strategies adopted by enterprises that grasp resources will affect the R&D investment of enterprises, therefore, when we study on the diversification strategy and R&D investment of enterprises in our country, it needs to consider the interaction effect of diversification strategy and government through the combine of the institutional environment of our country.

Whether enterprises implement diversification strategy will have an effect on R&D investment of enterprises. At first, as the internal technical innovation of enterprises requires higher investment level, and the payback period of technical innovation is longer, the technical innovation must be faced with higher uncertainty. The private enterprises with political connection that carry out diversified operation will invest much more funds to other industries with relatively lower uncertainty and higher earnings according to the information acquired on basis of the assets of social relations; and thus the senior executives will usually over-estimate the uncertainty of R&D investment, believe that the failure rate of R&D investment is higher than the expectation, and underestimate the value of innovation activities conducted by company, and then invest the funds into the industries with relatively lower uncertainty according to the information obtained through political relation, as a result, R&D investment level and enthusiasm of the company will be reduced; secondly, after the private enterprises that carry out the diversified operation develop to a certain stage, the scale of the company will be expanded thereby, the market position will be improved obviously, and the merger and acquisition ability of enterprises will be enhanced correspondingly; at this moment, the enterprises will be inclined to utilize their own market position to realize technical innovation through external merger and acquisition and other faster and convenient methods, to reduce the internal technical innovation investment, which will reduce the enthusiasm of enterprises to make R&D investment. Based on the above analysis, we propose Assumption 3.

Assumption 3: compared to the enterprises that not carry out the diversification strategy, the political connection of the enterprises that carry out the diversification strategy will have stronger negative effect on R&D investment.

C. *Type of subdivision diversification: regulating effect of related diversification and unrelated diversification*

For motivation on corporate diversification, scholars at home and abroad has conducted a large number of exploration and research, especially the overseas has a quite deep research on diversification strategy, for example, Khannan and Palepu (2000) considers that, under the circumstances of imperfect basic market system, the emergence of diversified enterprise group helps to solve the external market failure. In the view of resource-based theory, the reason why enterprises carry out diversified operation is that they have adequate resources. If the enterprise can't sell the rest of the

resources resulted by incomplete or asset specificity of market, they will use these resources for diversification. (Teece, 1982; Nelson and Winter, 1982). Based on principal-agent theory, the reason for business managers to choose diversification operation is due to the objective of maximization on self-profits, including establishing business empire and risk reduction to maintain the position of managers in enterprises. While, diversification in enterprises of China is different from diversification expansion carried out by enterprises in developed countries upon developing into certain period. Diversification of enterprises in China is usually carried out in earlier period of enterprise development, motivation of which is due to influence of external factors, when self-development is still immature, preferring to non-related diversification.

When carrying out related diversification, departments of enterprises are mainly in cooperative relationship, making the enterprises have advantages in resources utilization and technology synergy, and be able to more effectively apply product R&D capability, marketing resources, etc. to generate synergy among businesses and fulfill resource sharing. While carrying out non-related diversification, due to low sharing degree of resources in departments and information asymmetry, enterprises intend to apply financial control method, namely, measure department achievements through financial control, and department managers may possibly be short-sighted in operation, focusing on short-term achievements of enterprise by sacrificing long-term development, which will consequently cause enterprises to reduce capital in R&D investment activities with uncertainty investment benefits and long investment payoff period, and reduce R&D investment. Based on the analysis mentioned above, hypothesis 4 is brought out in this article.

Assumption 4: Compared with enterprise related diversification, political connection has stronger negative impact on R&D for enterprise with unrelated diversification.

III. EMPIRICAL RESEARCH DESIGN

A. *Sample selection and data sources*

This article takes the enterprises that belong to small and medium enterprise board listed companies of Shenzhen Stock Exchange from 2009-2012 as example, to study the influence of political connection owned by the enterprises on R&D investment intensity of enterprises by empirical test. This research limits the sample to be private enterprises, because the state-owned enterprises have political connection naturally and own more resources than private enterprises in our country. In comparison, private enterprises usually place the construction of political connection at the more important position, in order to get relatively fair development environment. During the process of sample selection process, it needs to remove the samples that not meet requirements or lack of date, mainly including the following types: (1) listed companies of financial or insurance category; (2) listed companies of which ST, *St

and PT under abnormal transaction state; (3) enterprises that not disclose the research and development investment data in annual statement, and the companies that lack of the sub-industry sales revenue data of diversification measurement index. Through selection, the total number of sample is 508, which is the cross-section data of 127 sample companies every year during the period 2009-2012. The political connection data is confirmed after comparison and organization of the information of actual controller in annual statement of enterprise and the personal information of senior executive in CSMAR, the data of R&D strength is taken from the R&D investment data of annual statement of enterprise, and the data of diversification are from the information of sub-industry in annual statement of enterprise.

B. Variable definition and measurement index

The data in this article are mainly the micro-data of small and medium enterprise board listed companies, the variables include the political connection, diversification strategy and marketization degree of enterprises, the investment in research and development of enterprises and enterprise scale and other control variables. The variables that mainly involved in the studies are shown as follows:

1. Explained variables

The variables in this article are expressed as R&D (Research and Development), to serve as the dependent variables. The research and development input indicators are divided to be absolute value and relative value, the absolute value refers to the specific amount of research and development expenditures, and the relative value includes the ratio of research and development expenditures to the total assets, to main business income or to research and development expenditure per capita of enterprises. The relative values, i.e. the R&D strength, adopted in most of studies are taken as the variables of R&D investment, to measure the condition of research and development of enterprises, and expressed by using the ratio of R&D investment to operating income of enterprises.

2. Explanatory variable

This article represents the variable of political connection of private enterprise as Pc (Political Connection), the strength of Political Connection is represented as Pcindex (Political Connection index), as the independent variable. Through using the methods of Pan Hongbo et al. (2010) and Deng Jianping et al. (2009), it is the representation of dummy variable of political connection, if the chairman of the board or general manager of enterprise has been or is the government official, or elected as NPC member or CPPCC member now, the value is 1, otherwise, it is 0. And meanwhile, through referring to the methods that Li Chuanxian, Gan Shengdao (2013) and Liu Qi and Yang Dewei (2012) adopted in studies on the political connection of private enterprises to measure the strength of political relation, we further set the value according to the degree of political connection owned by the chairman of the board or general manager of enterprise, to value on the basis of

constructing the strength index of political connection, if the chairman of the board or general manager of enterprise is the NPC member or CPPCC member of county level, or the bureau-level officer, the value is 1, if they are the member of municipal NPC member or CPPCC member or the county level officer, the value is 2; correspondingly, the value of the provincial NPC member or CPPCC member or the department officer is 3, the value of NPC member or CPPCC member or ministerial level and above is 4, the highest. The value of political connection strength is obtained by summing the political connection index owned by the actual controller, the chairman of the board or general manager according to the valuation.

3. Regulation variable

This article uses the diversification strategy of enterprises as the regulation variable, which is represented as Div (Diversification), RDiv (Related Diversification), and UDiv, (Unrelated Diversification). The basis of judging whether business operation is multi-industry in this article is *Guideline on Industry Classification of the Listed Companies in China*, which was formally formulated by China Securities Regulatory Commission in 2001. This research mainly analyzes according to the data in annual statement of enterprise and judges whether enterprise implements diversified operation through report information of sub-industry. When the proportion of industrial division that published in annual statement of enterprise is higher than 10% of the main business income of enterprise, it will be considered as a sub-industry of enterprise, to make judgment successively, if the number of sub-industry is more than 1, the enterprise will be deemed to implement the diversified operation. According to the classification code in classification guideline as mentioned above, this article judges what the enterprise implements is Related Diversification or Unrelated Diversification, when the first two digits of SIC codes that different sub-industries belong to are different, it will be deemed that the enterprise implements Unrelated Diversification, the variable of Unrelated Diversification of enterprise is 1; otherwise, the value is 0.

4. Control variable

Control variables are the variable beyond the independent variable and regulation variable that may have effect on R&D investment, according to the analysis on the factors that affect R&D investment of enterprise as mentioned above, this article selects the following variables that describe the internal characteristics and external environment of enterprise as the control variable of this research: enterprise scale (Assets). In this section, we select nature logarithmic value of total assets of enterprise as the value of control variable; enterprise performance (Perform). This article defines the business performance of enterprise as Perform, uses enterprise's net margin of last year to represent the business performance of the enterprise; enterprise age (Age). This article also use the year of enterprise registration shown on annual statement of the listed company as the starting year, to calculate the number of the going-concern years

up to the sample annual statement time that selected in this research (2009-2012); marketization degree (Market) can be represented by using the marketization level of the place where private enterprise locates. The index of marketization degree in this research is mainly selected from the marketization index of each province-level administrative region of *China Marketization Index* written by Fan Gang and Wang Xiaolu.

C. Model building and instruction

This article mainly studies the influence of the political connection of private enterprises on the R&D investment of enterprises, and the regulating effect of diversification strategy of enterprises. According to relevant research hypothesis proposed in this article, the following regression model is built:

$$Rd = \alpha_0 + \alpha_1 Pc + \alpha_2 Assets + \alpha_3 Perform + \alpha_4 Age + \alpha_5 Market + \epsilon_{jt} \tag{1}$$

In which, Rd means the strength of research and development of enterprise; Pc represents the dummy variable of political connection; Assets means enterprise scale; Perform means enterprise performance; enterprise performance represents the years of establishment of enterprise; Market represents marketization level; ϵ is residual term.

And meanwhile, in order to inspect the regulation effect of diversification strategy, the following model is set:

$$Rd = \alpha_0 + \alpha_1 Pc + \alpha_2 Pc * Div + \alpha_3 Div + \alpha_4 Assets + \alpha_5 Perform + \alpha_6 Age + \alpha_7 Market + \epsilon_{jt} \tag{2}$$

In which, Div means the diversification strategy of enterprise, and other variables are the same with the ones in Model (1)

IV. EMPIRICAL RESULTS AND ANALYSIS

A. Regression analysis on linear relation between political connection and R&D investment

Here we'll carry out discussion on influence and effects of dummy variable and strength of political connection on enterprise R&D investment. We apply software Eviews7.2 to carry out regression analysis on models, and firstly, quantitative analysis is carried out on panel data in 2009-2012 of private listed companies in China. Cross-section weights method of fixed effect is applied in this article to avoid heteroscedasticity problem. Please find regression result in Table I.

TABLE I.

REGRESSION RESULT OF R&D INTENSITY ON THE PRESENCE, ABSENCE AND STRENGTH OF POLITICAL CONNECTION

Variables	Model (1)	Model (2)
C	20.19643** (10.92171)	21.50341** (11.63605)
Pc	-0.644137** (-6.373883)	
Pcindex		-0.889462** (-4.683751)
Assets	-0.808056** (-8.618398)	-0.889462** (-9.539311)
Perform	0.106675** (3.491036)	0.129901** (4.151943)
Age	0.080738** (5.317737)	0.074095** (4.817516)
Area	-0.151389** (-4.209687)	-0.148819** (-4.176402)
N	508	508
Adjusted R-squared	0.237654	0.227417
F	32.61041**	30.84800**

Notes: *and**separately represents the dependency is obvious in level of 5% and 1%.

In Table 1, data in model 1 is the regression result of R&D intensity on the presence or absence of political connection, and when we analyze by OLS, the result shows that, comparing with other enterprises, R&D

research input of private enterprises that seeking for political connection is lower by 0.64%. As you see, after receiving resources such as fund, policy information, etc. through political connection, private companies in China

do not invest more capital into research and development, which has a lot to do with current marketing economy condition in China. Recently, economy in China is still in transitional period, with lower marketization degree and stronger government intervention effect, and enterprises usually establish political connection through “rent-seeking” to acquire more external financing, market access to monopolized industries, etc., hoping to bring more profits for enterprises. While, this kind of economic profit brought through political connection is usually not favorable for long-term development of enterprises, and the short-sighted behavior in operation shall spread over the whole society like infectious disease. Rent-seeking activity (including establishing political connection) means the non-productive activity in which specific interest groups carry out lobbying to government policy-making or public officials to seek profits, which plays serious a inhibition role in economic growth, and in this way, the existence of political connection shall cause scarce resources to be concentrated in non-productive industries, resulting in crowding-out effect of productive activities such as investment in R&D, etc. The empirical result shows out that R&D input intensity of private enterprises with political connection is lower than that of the enterprises without political connection, which is obvious in 1% level. This result shows that political connection has obvious negative influence on R&D input of private enterprises, which is the verification on hypothesis 1.

Model 2 in Table 1 is the regression result of R&D intensity to political connection strength, which shows that when political connection strength enhances by 1, the R&D investment intensity shall be lowered by 0.13%, being obvious in 1% level. This is possibly due to that the rapid high returns in industries such as real estate, etc., makes many private enterprises to be unwilling to input limited funds to technology innovation of products, but the industries with high rate of return and short recovery period. Secondly, the imperfect risk sharing mechanism, enterprises shall be faced with great risks when investing in technology innovation, including technology risk and marketing risk, and if technology innovation fails to reach expected technological achievements, due to the weaker protection mechanism for private enterprises in China, the most serious result shall be the possible risk of bankrupt of private enterprises. Because of the slow development of venture investment industry in China and imperfect risk sharing mechanism in technology innovation, private entrepreneurs naturally dare not to carry out investment in technology innovation, with high stakes. Thirdly, the weaker protection on intellectual property. Due to insufficient protection on intellectual property held by enterprises and comparatively low cost of imitation, most enterprises focus on imitation when developing new products, while for those who really carry out technology innovation, their achievements are difficult to be effectively protected. Along with the strength of political connection, enterprises are stronger to acquire resources and easier to break through industry barrier to prefer to the industries with high rate of return

and short recovery period, resulting in lower R&D investment intensity. This result shows that the stronger the political connection strength, the lower the R&D investment of private enterprises, which verifies hypothesis 2.

B. Regression analysis on non-linear relation between political connection and R&D investment

In order to verify whether there's U-shaped relationship or inverted U-shaped relationship between political connection and R&D investment, next, non-linear examination shall be carried out on the two aspects, and the regression result is shown in Table II.

Table II

REGRESSION RESULT OF NON-LINEAR RELATION BETWEEN R&D INTENSITY AND POLITICAL CONNECTION STRENGTH

Variables	Model (3)
C	20.90112** (12.368 47)
Pcindex	-1.161631** (-9.698820)
Pcindex ²	0.326158** (8.753703)
Assets	-0.814947** (-9.262113)
Perform	0.080915** (2.655410)
Age	0.086297** (5.627818)
Area	-0.163058** (-4.527315)
N	508
Adjusted R-squared	0.358209
F	48.16272**

Notes: *and**separately represents the dependency is obvious in level of 5% and 1%.

In Model 3 of Table 2, quadratic component of political connection strength is added to measure the non-linear relation between political connection and enterprise R&D investment. It is observed in this Table that political connection and its quadratic component are obvious in 1% level, with coefficient of quadratic component to be positive, therefore, there's U-shaped functional relationship between political connection strength and R&D investment intensity, meaning that when political connection strength being weaker, enhancing of political connection will cause enterprises to reduce R&D investment; however, with successive increase in political connection degree, its negative marginal effect on R&D investment shall be constantly

weakened; when reaching to a certain degree, it will be inverted to be a positive role in R&D investment.

It is possibly because that the anti-risk capability is relatively weak, in the early period of enterprise development or small scale of enterprise, and private enterprises suffer from double pressures in capital and policy. Actual controllers of enterprises, such as managers, directors, etc., usually will initiatively seek for political connection. Private enterprises hope to establish relationship with government to make policies and environment to be more favorable for enterprises, under the circumstance of imperfect marketing mechanism and immature enterprise development, while due to the relatively weak social influence of enterprises at the moment, the established political connection is comparatively low. Furthermore, at that time, most private enterprises prefer to consider the survival problem of enterprises, how to effectively protect private property of enterprise, etc., and the political activity of enterprises is more likely to be non-productive activity, investing a lot of energy to political field, while after acquiring resources such as policy, capital, information, etc. demanded by development through taking advantage of political connection, they usually choose to operate projects with low risk, stable market and fast return of profit, in order to enter into industries with higher profits, fulfill diversified development of enterprises, and improve anti-risk capability of enterprises, not caring about the technology innovation projects with high risk, long R&D period and unstable market. In this way, R&D in enterprises plays second fiddle, causing the capital to be used in R&D to be restricted and R&D investment intensity of enterprises to be reduced inevitably.

Upon developing into certain stage, the social influence of enterprises becomes stronger, and the established political connection level is usually higher, to be provincial even country level. At that time, enterprises shall be gradually matured, with enhanced anti-risk capability, and focus more on market influence and long-term development. Furthermore, for those comparatively matured enterprises, resources acquired through establishing relationship with government can be able to more efficiently translate into competitive advantages of enterprises. Technology innovation is the only way leading to sustainable development of private enterprises, while resources restriction on technology innovation in private enterprises mainly include being short of technical talent, innovation capital, market information, being difficult to acquire proper technology, etc. Private enterprises, upon developing into certain stage, will gradually enhance capability in acquiring, integrating and adsorbing & utilizing external innovation resources, and effectively attain the resources factors demanded by technology innovation to consequently increase R&D investment required in technology innovation, making the R&D investment intensity to be enhanced.

C. Regulation function of diversification strategy

Based on regression analysis on political connection and enterprise R&D investment, regulation function of diversification strategy is added to verify, in empirical test, the interactive influence of political connection and diversification strategy on enterprise R&D investment. The regression analysis result is shown in Table III.

Table III.

REGULATION FUNCTION OF DIVERSIFICATION STRATEGY AND SUBDIVISION OF DIVERSIFICATION TYPES:
REGRESSION RESULT OF RELATED AND UNRELATED DIVERSIFICATION

Variables	Model (4)	Model (5)
C	7.373209** (21.46686)	68.29875* (2.387124)
Pc	-0.531415* (-2.438529)	-4.871923* (-2.382762)
Div	2.155326** (6.710501)	-3.171935 (-1.391332)
Pc*Div	-1.873625** (-4.476265)	-
Pc*UDiv	-	7.617348* (2.461956)
Assets	-0.864285** (-6.060698)	-2.919056* (-2.201855)
Perform	0.659016** (10.17523)	0.206376 (0.835728)

ge	0.078009** (9.241066)	0.636387* (2.544376)
Area	-0.312578** (-10.04761)	-0.967591* (-1.991517)
N	508	111
Adjusted R-squared	0.060116	0.157198
F	5.614307**	3.931012**

Notes: *and**separately represents the dependency is obvious in level of 5% and 1%.

It is realized that, from Model 4 in Table 3, coefficient of political connection and cross coefficient of political connection and diversification are negative, also being obviously in 1% level. This shows that diversification strategy plays a reinforce role in negative correlation of political connection and R&D investment intensity. Enterprises with political connection usually are able to attain more scarce resources, and more easily to break through industry control barrier to enter into the industries with comparatively high profits. Therefore, they will less input capital to R&D investment, especially when there's unsystematic information between company and market, due to conservative estimation principle, the investors prefer to overrate the uncertainty of R&D investment and underrate the value of carrying out technology innovation activities, in this way, enterprises usually reduce technology innovation activity in internal company, causing R&D investment degree to be comparatively low. For those enterprises in diversification operation, the short-sighted intention of managers is more serious, inputting more capital to other industries with comparatively low uncertainty and high profits and reducing R&D investment, which are unfavorable for long-term development of enterprises. With enterprises carrying out diversification operation, scale of enterprises is enlarged for them to easily attain new technology through merger and acquisition, etc., and due to efficiency and convenience of external merger and acquisition, enterprises would prefer external merger and acquisition to fulfill technology innovation, resulting in enterprises reducing their investment in R&D of technology innovation. This result shows that diversification strategy plays an enhance role in the negative correlation of political connection and R&D investment intensity, which verified hypothesis 3.

Meanwhile, among the 508 samples in this study, there are only 111 enterprises carrying out diversification, and 46 enterprises carrying out non-correlated diversification. Due to the small data volume, Eviews7.2 is applied to carry out simple cross section model test, and the regression result of regulating effect of related and non-related diversification is show in data of Model 5 in Table 3. It is suggested in the data result that, coefficient of political connection's influence on R&D investment is negative, cross coefficient of political connection and non-related diversification is positive, both of which are obvious in 5% level. It shows that, non-related diversification plays a weakening role in negative influence on political connection and R&D investment,

and corresponding related diversification plays enhancing role in the negative influence on political connection and R&D investment, which is inconsistent with hypothesis 4. The reason for this phenomenon is possibly that number of samples in this study in small, causing the study result to occur error, also possibly due to the particularity of diversification of enterprises in China. Some part of theoretical analysis brought out by the hypothesis shows that, technical synergy and cooperative relationship among operating departments in enterprises with diversification are able to promote the enterprises to carry out R&D investment; while, non-related diversification will cause the enterprises to more apply financial control to measure the achievements of departments, resulting in that department managers sacrifice long-term development due to considering short-term achievements and cause shortage in R&D investment.

V. STUDY CONCLUSION AND ENLIGHTMENT

In this article, successive 4 years' data (2009-2012) of 127 private listed companies are selected to carry out empirical analysis on the influence effect of political connection to enterprise R&D investment, and verification on the regulatory effect of diversification strategy. Detailed study result is shown as follows:

(1) From the regression result of influential effect of political connection to enterprise R&D investment, comparing to other enterprises, for those private enterprises that seeking for political connection, the R&D investment intensity is low, namely, influence of political connection to enterprise R&D investment is negative, which is obvious in 1% level, as expected. Analysis on political connection strength also verifies hypothesis 2, and the strong the political connection capital held by private companies, the small the R&D investment intensity. In general, comparing to enterprises with non-political connection, technology innovation level of private enterprises with political connection is lower, and political connection plays an obstructive role in technology innovation activity of private enterprises.

(2) Quadratic component of political connection is added to measure the non-linear relation of political connection and enterprise R&D investment. It is suggested from the result that, political connection

strength and its quadratic component are obvious in 1% level, and the coefficient of quadratic component is positive, showing that there's U-shaped functional relationship in political connection strength and R&D investment intensity, and based on the linear model mentioned above, we can know that when political connection reaching to some certain strength, political connection strength is in negative correlation with R&D investment intensity, while exceeding certain value, political connection strength shows positive influence on R&D investment intensity. Larger scale enterprises usually have higher level of political connection, upon developing to some certain degree, the capability of integrated utilization on resources is stronger, and they will focus more on effect of market and long-term development of enterprises, therefore, when political connection strength reaching to some degree, enhancing of political connection will play a promoting role in R&D investment intensity.

(3) Diversification strategy plays an enhancing role in negative influence of political connection to R&D investment. Government control on enterprises' admittance in and withdrawal from industries will influence situation of market competition, and policies brought out by the government have an important impact on competition environment of enterprises, and plays an important role in implementation and development of enterprise strategy. Enterprises with political connection usually are able to attain more scarce resources, and when there's unsystematic information between company and market, due to conservative estimation principle, the investors prefer to overrate the uncertainty of R&D investment and underrate the value possibly brought through carrying out technology innovation activities. In this way, enterprises usually reduce investment in technology innovation activity. While, enterprises in diversification operation generally hold more stable investment program with higher return rate, therefore, they will input more fund into other industries with comparatively low uncertainty and higher profits, which will lower R&D investment of company, being not favorable for long-term development of enterprises. Furthermore, along with enterprises carrying out diversification operation, company scale expansion improves merger and acquisition capacity of enterprises, which is in substitution effect on the capacity of attaining technology innovation through R&D investment, being unfavorable for the improvement of enterprises' R&D investment.

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