Ownership Structure and Firm Technical Innovation：

a Theoretical and Empirical Analysis on Chinese Enterprises[1]

STRUCTURE POSSESSIVE ET INNOVATION TECHNIQUE DES ENTREPRISES：

UNE ANALYSE THEORIQUE ET EMPIRIQUE DANS LES ENTREPRISES CHINOISES

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Abstract: Taking more than 600 enterprises as example, this paper analyzes the influence of managers' features on the relationship between ownership structure and technical innovation of the firm. The authors find that the managers' care to owners benefit (Emc) and the managers' talent(Ta) have positive influence on firm technical innovation (Inte), and the ownership share of different kinds of owners have different effects on Emc and Ta. Therefore, ownership structure can not only directly influence the technical innovation of the enterprises, but also influence it indirectly.
Key words: ownership structure, firm technical innovation, managers' care to owners benefit, the managers' talent

Résumé: Prenant en exemple plus de 600 entreprises, ce document present analyse l' influence des caractéristiques des managers sur les relations entre la structure possessive et l'innovation technique des entreprises. Les auteurs trouvent que l'attention des managers aux intérêts des possédants (Emc) et le talent des managers (Ta) effectue une influence positive sur l' innovation techniquel des entreprises(Inte), et le partage possessif de possédants de toutes les sortes a de differents effects sur Emc et Ta. Cependant, la structure possessive peut influencer l'innovation technique des entreprises directement à la fois indirectement.
Mots clés: structure possessive, innovation technique des entreprises, attention des managers aux intérêts des possédants, talent des managers

1. INTRODUCTION

Technical innovation is regarded as the key for enterprises to improve their competitive ability (Rita Gunther McGrath,1996). In order to enhance technical innovation of the firms, the function of managers of the firms should be taken into account（J. A. Schumpeter，1934）, and the influence of the ownership structure on firm technical innovation should be paid more attention to(Shaker A. Zahra,2000;B. J. Bushee, 1998).

But, the theoretical or empirical research of the relationship between the ownership structure and firm technical innovation is rare（Nicola Lacetera，2001；Barry D. Baysinger, et al.,1991）, and the research of the effects of managers' features on the relationship is even infrequently.

In this paper we'll study the influences of ownership structure on managers' features, and how the ownership structure affects corporate technical innovation (Inte) through managers' features. We have 5 parts in this paper, part 2 is the theoretical analysis and hypothesis, part 3 is the research method, including data source and variable measure, part 4 is the research result, and part 5 is the discussion and conclusion.

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2. THEORETICAL ANALYSIS AND HYPOTHESIS

To Chinese enterprise in period of economy system reforming , the managers' features can influence the firm technical innovation(Inte), and the ownership structure have effects on managers' features. Research on the separation between ownership and control (A. Berle & G. Means，1933; Williamson, O. E., 1975) indicates that the reason why the owners hire managers to take part in the technical innovation is to make use of the managers' talent, and opportunism of the hired managers may harm the owners' benefit. Therefore, the managers' care to the owners benefit (Emc) and the managers' talent may have influence on the corporate technical innovation.

Harold Demsets(2001) argues that the function of the adjustment of property right is that of guiding incentives to a greater internalization of externalities . So the adjustment of ownership structure has two kinds of function (figure 1): to influence Emc through its effect on the owners' motive to monitor the hired managers, and to influence Ta through selecting managers by the owners. The cost (time, money, and energy) for the owners to perform the first kind of function is distributed averagely through the whole process of the owners supervision to the managers, and the cost of the second kind is usually pooled in period of selecting the managers.

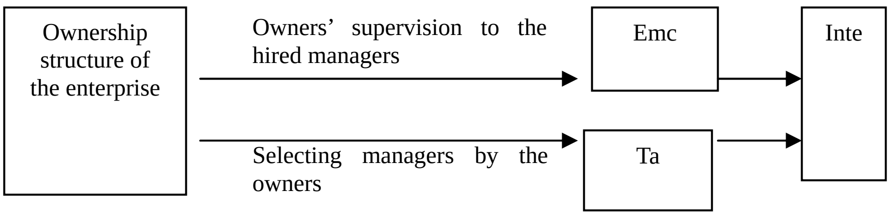

Figure 1Influence of the ownership structure on corporate technical innovation through managers' features

2.2 Technical innovation of the firm and managers' features

2.1.1 Technical innovation of the firm (Inte) and managers' talent (Ta)

The managers' talent (Ta) is the premise of firm technical innovation (Inte). In Schumpeter' s innovation theory (J. A. Schumpeter , 1934), innovation is the main function of the entrepreneur, and to achieve this function the entrepreneur must has outstanding talent in judgment, decision, organizing and allocating resources. In his theory on entrepreneur's talent, Keznill said that the reason why a entrepreneur is a entrepreneur is that he has the ability to find the potential profit. When they analyzed the separation of ownership and control, Berle & Means(A. Berle & G. Means,1933) ,and Williamson (Williamson,O. E., 1975), implied that the reason why the owners hire the managers to innovate rather than innovate themselves even when the managers might pursue their own goal, is to make full use of the managers' s talent. Some other scholars also thinks that the managers' talent is important for innovation (Amir K., Abadi Ghaidim, 1999), for example, Ester argues that a manager's capability will influence his choice on the type of innovation (Ester Martinez-Ros, 2000); and some scholars state that the absence of managers' talent is the obstacle of innovation and the excellent talent of the managers is very important for product innovation of a firm(Win E. Souder, et al., 1999).

In fact, technical innovation of a firm has high risk(from Mansfield' s point, 88% innovative activity fails (Yoser Gadhoum ,1999)),it lacks routine rules to follow, and it needs many resources to input, ——these features of technical innovation require excellent talent of the participants otherwise the innovative activity will fails. As the corporate managers are the center in allocating innovative resources and organizing innovative activity, the managers' excellent talent is necessary for corporate technical innovation. Therefore, we have ,

Hypothesis 1: The talent of the corporate managers (Ta) has positive influence on corporate technical innovation (Inte).

2.1.2 Firm technical innovation (Inte) and the extent of manager's care to owners' benefit (Emc)

The success of firm technical innovation depends greatly on if the managers pay enough care to the owners' benefit. Especially in this time when the separation of ownership and control is a widely spread phenomenon, the extent of managers' care to owners' benefit (Emc) will greatly influence whether the talent of the managers could be made full use of in corporate technical innovation (Inte). Mansfield regarded that the managers would reduce input on innovation if they only care for their own interest and evade risk of innovation(Yoser Gadhoum, 1999), and Gamble agreed to his point(John E. Gamble, Journal of Business Venturing 15) . Daniel argued that the managers' attitude to risk would influence the corporate innovation (Daniel A. Rogers, 2002). When explaining the relationship between institute ownership and R&D spending, Hansen and Hill stated that large outside owners supervise and urge the managers to increase R&D spending to pursue high profit, even if the risk of innovation is also high (G. S. Hansen & C. W. L. Hill, 1991). Because that innovation needs generous and continued invest with the supporting of managers(R. Kanter,1986; D. F. Kuratko , et al.,1997), it will not success unless the managers have more care for the owners' benefit and provide their supporting to innovation. The theory of agency (Jensen, Michael C. & Meckling, 1976) tells us that when the interest of owners and that of managers are tied closely, the supporting of managers to innovation will increase and the result in innovation will also increase. Besides, when studying product innovation, Gary Tighe also found that the managers' attitude to job is positively related to innovation(Gary Tighe, 1998) .

Because of above reasons, we have,

***Hypothesis 2*: The extent of managers' care to owners' benefit (Emc) is positively related to corporate technical innovation (Inte).

2.1.3The managers' talent (Ta) and the extent of managers' care to owners' benefit (Emc)

The extent of managers' care to owners' benefit (Emc) can influence their talent (Ta). This is because that the talent or ability of the managers is the result of their study, and this study can happen before the managers were hired as managers, or happen after that. The theory of study tells us that the attitude of members in a organization will affect their enthusiasm and efficiency in improving their talent for the organizational goals(Garvin, D. A., 1993) , so, the more attentions the managers pay to the owners' benefit, the more desires they have to improve their talent or capability by method of "learning by doing"(K. Arrow, 1962) (or other kinds of methods) for corporate benefit. Therefore, we provide hypothesis 3,

Hypothesis 3: the extent of managers' care to the owners' benefit (Emc) is positively related to their talent (Ta).

2.2 Ownership structure and managers' features

2.2.1 Ownership structure and Emc

Ownership shares of different kinds of owners causes different allocation of costs and profits among the owners(Jensen, Michael C. & Meckling, William H., 1976) , and therefore will influence the motive for the owners to inspire or supervise the extent of managers' care to owners' benefit (Emc). Demsetz regards property rights as the right to benefit or harm oneself or the others (Harold Demsets ,2001), and argues that a primary function of property right is that of guiding incentives to a greater internalization of externalities. To our point, ownership shares of managers or other owners just have the function of guiding incentives to a greater internalization of externalities.

First, ownership shares of managers(Sm) and Emc

The increase of managers' ownership shares will help to improve Emc. Some research finds that the less ownership shares of the managers, the more possibility of their opportunism(Joseph T. L, 2000); and a certain quantity of ownership shares can reduce the managers' opportunism motive by binding their benefit with that of the owners more closely(Jensen, Michael C. & Meckling, William H.,1976; Ki C. Han, et al., 1998; Robert De Young, et al., 2001; Helen Short, et al., 1999; Shaker A. Zahra, 2000) .

Some scholars state that in a certain range of managers' ownership shares, the increase of the ownership shares of the corporate managers might cause increased control-right of the managers and strengthen the manager s' ability to perform opportunism activity(John M. Griffith,et al., 1999;Ki C. Han, et al., 1998; Robert De Young, et al., 2001; Helen Short, et al., 1999) . But as to Chinese enterprises, to our point, the problem of "control by internal persons" in these enterprises is mainly caused by the absence of outside supervision, and no research finds that this problem is caused by the managers' ownership shares.

Therefore, we have,

***Hypothesis 4(a)*:** The fraction of ownership shares of managers(Sm) is positively related to Emc.

Second, Ownership shares of other kinds of owners and Emc

The efficiency of different kinds of owners in supervising the managers is different. To different kinds of owners, the agent levels between initial creditors and the enterprise is different, and the ability to supervise the enterprises is also different. The more levels between initial creditors and the enterprise, the more difference between the goal of the initial creditors and that of the enterprise, and the less efficiency of the initial creditors in supervising the managers.

The ownership shares of government (Sg) will not help to guarantee the Emc. The agency levels between the initial creditors (the public) of the government owner and the enterprise are more than that between the initial creditors of other kinds of owners and the enterprise. Besides, the government officers usually have only limited knowledge and information in supervising activity of the firm, and different departments of the government may have deputation on who represent the owner of national capital in the enterprise, and the government has to consider some other goals rather than economic goal(Maxim Boycko, et al.,2001; Anne O. Krueger, 1990).

Therefore, we have,

***Hypothesis 4(b)*: ** The fraction of ownership shares of the government (Sg) is negatively related to Emc.

The ownership shares of legal person (Sl) will help to guarantee Emc. Legal person owners in China include some parts that have fewer agency levels (for example, the legal person that is a enterprise). So, the legal person owners as a whole will pay more attention to the manager's activity if they have more ownership shares(Xiaonian Xu, Yan Wang, 1999) . Besides, Chinese legal person owners appeared in the period of economy system reforming, and it is a focal point of the whole society, which means that the attention from the society will force the managers to consider the owners' benefit more.

Therefore, we have ,

***Hypothesis 4(c)*: ** The fraction of ownership shares of legal person (Sl) is positively related to Emc.

2.2.2 Ownership structure and Ta

The reason why the owners hire managers to innovation even when the separation of ownership and control may cause difference of their goals (A. Berle & G. Means , 1993), is to obtain and to utilize the managers' talent (Ta) or ability. Bruten found that the absence of talent is one of the main reasons why the managers are retired (Gary D. Bruten ,et al. , 2000). As the mechanism of choosing managers has its defects, only those owners who are willing to and are able to pay necessary cost to choose managers can guarantee the hired managers have high talent.

Firstly, let's look at the influence of managers' ownership shares on Ta. Ta is positively related to the ownership shares of managers(Sm). When the managers of the enterprise own more ownership shares, their goal will be more consistent with that of the whole owners(Jensen, Michael C. & Meckling, William H.,1976; Ki C. Han, et al., 1998; Robert De Young, et al., 2001; Helen Short, et al., 1999; Shaker A. Zahra, 2000) . For their own interest, if their talent is poor they will not take on the responsibility of management because the loss will be more endured by themselves, and if their talent in managing the firm is high they will actively take on the responsibility of management because more benefit will be shared by themselves. Therefore, we have,

***Hypothesis 5(a)*: ** The fraction of ownership shares of managers(Sm) is positively related to Ta.

Secondly, the influence of the ownership shares of other kinds of owners is mainly embodied in choosing management. According to the theory of study(Garvin, D. A., 1993) , talent is the result of study, and the managers' talent may come from the study after they are hired (when different kinds of owners may influence the managers' talent indirectly through Emc, as we have talked about above), or come from the study before the managers are hired(when different kinds of owners may influence the managers' talent directly by choosing managers who have accumulated talent from their quondam experience). Different from supervising managers' daily activity, it is not a frequently activity for the owners to choose managers, and the owners only need to pay cost once or limited times for choosing managers. The kinds of owners who are able to pay this kind of cost can choose managers efficiently, and the kinds of owners who are not able to pay this kind of cost cannot guarantee high talent of the chosen managers. Among all the owners, the ownership shares of the social public will not help to choose managers who have high talent efficiently. Limited knowledge and information on innovation, dispersed capital, and lack of organization, are all barriers that prevent the public to choose managers efficiently.

Therefore,

***Hypothesis 5(b)*: ** The fraction of ownership shares of the public (Spu) is negatively related to Ta.

Different from the scattered public, the ownership shares of some kinds of owners, such as the government, the legal person, the proprietor of the enterprise (in China, proprietor usually means large outside private owner), and foreign investor, may contribute to choose qualified managers. These kinds of owners have advantages in capital and social relationship , therefore, they can make full use of these advantages to choose managers themselves or to invite relative specialist to choose qualified managers for them. As to the government, it can utilize its advantage to obtain enough information about candidate, and get supporting from relative departments or specialist. To the legal person owner, it appeared with the progress of Chinese enterprise reforming, and the whole society pays attention closely to them; besides, it usually have advantage in fund and social relationship. The proprietor usually has more opulent fund than the public owners, and its ownership is more concentrated than that of the public, therefore, the proprietor will be willing and able to make sure that the chosen managers have essential talent if he has more ownership shares. As to the foreign investor, he has vantages in capital, international relationship, and management thinking, which will enable him to select suitable persons to be the corporate managers.

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***Hypothesis 5(c)*: ** The fraction of ownership shares of government (Sg) is positively related to Ta.

***Hypothesis 5(d)*: ** The fraction of ownership shares of legal persons (Sl) is positively related to Ta.

***Hypothesis 5(e)*: ** The fraction of ownership shares of proprietor (Spr) is positively related to Ta.

***Hypothesis 5(f)*: ** The fraction of ownership shares of foreign investors (Sf) is positively related to Ta.

2.3 The direct relationship between ownership structure and firm technical innovation

As we have discussed above, the ownership structure of enterprises can influence firm technical innovation (Inte) indirectly through managers' features. Furthermore, it can influence firm technical innovation directly, because it may has influence on other participant of the innovation(Henry Hansman , 1996).

Among all kinds of owners, managers who have ownership shares have more obvious advantages in directly influencing the innovation of technology than other kinds of owners. As participant of corporate technical innovation(J. A. Schumpeter,1934) , the manager usually has more experience and knowledge in innovation, which will help him to find out the possible opportunism of other participants and prevent their opportunism to harm the owners' interest. Therefore, more ownership shares of the managers will strengthen their motive to supervise other participants of the innovation and directly contribute to technical innovation of the enterprise.

***Hypothesis 6(a)*:** The fraction of ownership shares of managers(Sm) is directly and positively related to technical innovation of the enterprise (Inte).

The government's ownership will harm the technical innovation of the firm directly. As a owner of the enterprise, the more agency levels between the initial creditors (the public) of the government and the enterprise will reduce the supervisory incentive of the government officials. Besides, the limited knowledge and information of government officials about innovation, the deputation among different departments of the government on who represent the owner of national capital in enterprises, and other goals of the government (for example, goal of full employment) rather than the economic goal (Maxim Boycko, et al., 2001; Anne O. Krueger,1990) , may all go against the technical innovation. Therefore, we have,

***Hypothesis 6(b)*:** The fraction of ownership shares of government (Sg) is directly and negatively related to technical innovation of the enterprise (Inte).

Ownership shares of the public may be also detrimental to the technical innovation directly. Supervision on technical innovation needs specialized knowledge, especially knowledge about relative technology and science, but usually the social public lacks of this kind of knowledge. Moreover, the public is not organized, and its fraction of ownership shares is scattered which diminishes the supervision incentive of the public owners. Therefore,

***Hypothesis 6(c)*:** The fraction of ownership shares of the public (Spu) is directly and negatively related to technical innovation of the enterprise (Inte).

3. METHODS

3.1Data source and collection of data

Data used in this paper come from an investigation on running circumstances of Chinese enterprises from 1997 to 2001. The investigation involves enterprises from Guangdong, Liaoning, Shandong, Shannxi, Shanxi, and Sichuan provinces . The involved industries include electronics, petrifaction, materials, food, printing, fabric, and so on. The enterprises involved include state-owned or state-controlled enterprises, foreigner-invested enterprises, private enterprises, stock companies, village enterprises. 805 questionnaires were distributed and 607 valid questionnaires were returned back, which means that about 75% of the distributed questionnaires are valid.

In order to make sure that the collected data is reliable, help from government was obtained, and items of the questionnaire were tested before formal investigation. Besides, the collected data were judged and selected according as whether the data were unfeigned and valid. The judged and selected data were inputted into database to become the sample of our study. The investigation was performed by visiting, email, or fax.

3.2 Variable measure

Corporate technical innovation (Inte) Technical innovation includes product innovation and innovation in technical process(Peter Witt, 1998). Product innovation is the innovation in capability , type, appearance, or service of the product(D. D. Roman and J. F. Puett, 1983), and the technical innovation can come from the innovative activity of the enterprise, or come from the outside of the enterprise(Peter Witt, 1998; H. Albach,1994) . In our research, ***Inte*** is represented by the following aspects: (ⅰ)brand-new product innovation,(ⅱ) gradual improvement in capability, type, appearance, or service of the product, (ⅲ) new technology come from the outside of the enterprise, (ⅳ) new technology invented by the enterprise. In this study, ***Inte*** is a composite index constructed from these aspects by factor analysis, and α in reliable analysis is 0.7986, KMO is 0.810.

Managers' care to owners' benefit (Emc) Emc is an item of the questionnaire, it can be obtained directly from the database.

Talent of the managers (Ta) According to Robin Snell, et al.(Robin Snell, Agnes Lau, 1994; Chao C. Chen, et al., 1998), in this study Ta is represented by the following aspects: (ⅰ) the ability of the managers to get information of market demand accurately, (ⅱ) time and energy which the managers spend in serving the clients, (ⅲ)ability of the managers to judge accurately the change in market demand, (ⅳ)the ability of the managers to catch the business chance, (ⅴ) the ability of the managers to control the future of the enterprise, (ⅵ)the ability to organize and encourage the staff efficiently, (ⅶ)the ability to supervise the staff efficiently, (ⅷ)the ability to organize the resources efficiently, (ⅸ)the ability to identify the talent of the staff,(ⅹ)the ability to run the enterprise smoothly. Ta is a composite index constructed from these 10 aspects by factor analysis, and α in reliable analysis is 0.9419, KMO is 0.934.

Ownership share of each kind of owners (Sm, Sg, Sl, Spr, Spu, and Sf) Sm, Sg, Sl, Spr, Spu, and

Sf respectively stands for the fraction of ownership shares of managers, of government, of legal person, of

proprietor, of the public, or of the foreigners. According to Chowdhury (Shamsud D. Chowdhury, et al., 2001),

they are respectively valued by averaging the fraction of ownership share of the relative owner in 1997,

1999, and 2001 in the enterprise.

Corporate size(Size) Variable ***Size*** in our study is a control variable. According to Tosi and Katz (H. Tosi,& L. Gomez-Mejia, 1989; Jeffrey P. Katz,1995) , ***Size*** in our study is a composite index constructed from assets, sales, number of employees by factor analysis. And α in reliable analysis is 0.9419, KMO is 0.934.

4.RESULTS

Table 1 Results of analysis

Dependent variables / Independent variables	Innovation in technology (Inte)		Talent of managers(Ta)	Extent of managers' care to owners' benefit (Emc)	
	Model 1	Model 2	Model 3	Model 4	Model 5
Extent of managers' care to owners' benefit(Emc)	0.115**	0.119**	0.139**	——	——
Talent of managers (Ta)	0.071+	0.075+	——	——	——
Ownership shares of managers (Sm)	0.086*	0.086*	0.104*	0 .099*	0.075+
Ownership shares of government (Sg)	-0.089*	-0.105*	0.151**	-0.108**	-0.104*
Ownership shares of legal person (Sl)	——	-0.043	0.058	0.101*	0.095*
Ownership shares of proprietor (Spr)	——	-0.011	0.085+	——	0.055
Ownership shares of the public (Spu)	-0.094*	-0.082*	-0.072+	——	0.051
Ownership shares of the foreigners (Sf)	——	-0.009	0.086*	——	0.012
Corporate size (Size)	0.333**	0.334**	——	——	——
Adj. R^2	15.5	15.2	9.0	8.8	8.9
F	19.490**	13.094**	4.591**	9.021**	5.082**

Note：+ p < 0.1, *p < 0.05, **p < 0.01. Estimates are standardized.

Table 1 is the results of regression analysis with Emc, Ta, and Inte to be the dependent variable respectively.

The analytical results of Model 1 show that both Emc and Ta have positive effects on Inte. Moreover, the fraction of ownership shares of managers is directly and positively related to Inte, while that of the government or of the public is directly and negatively related to Inte. Hence, hypothesis 1, hypothesis 2, hypothesis 6(a), hypothesis 6(b), and hypothesis 6(c), are all proved. In order to find the possible direct effects of the ownership shares of other kinds of owners on Inte, we further studied Model 2 by regression analysis. No evident was found to prove that the ownership shares of other kinds of owners (legal person, proprietor, or the foreigner) had directly effects on Inte, while the effects of ownership shares of the managers, of the government, or of the public on Inte, were proved again.

The analytical results of Model 3 show that the ownership shares of the managers, of the government, of the proprietor, or of the foreigners, have positively effects on Ta, and the ownership shares of the public has negatively effects on Ta. But the results don't show that the ownership shares of legal person has obvious influence on Ta. Besides, the results show that the extent of managers' care to the owners' benefits will contribute to Ta. Hence, hypothesis 3, hypothesis 5(a), hypothesis 5(b), hypothesis 5(c), hypothesis 5(e), and hypothesis 5(f), are all proved, but hypothesis 5(d) is not proved.

From the analytical result of Model 4, we know that the increment of the fraction of ownership shares of management or of legal persons will help to increase Emc, while that of government has negative influence on Emc. So hypothesis 4(a), hypothesis 4(b), and hypothesis 4(c) are all proved. In order to find the possible effects of the ownership shares of other kinds of owners on Emc, we further studied Model 5 by regression analysis. No evident was found to prove that the ownership shares of other kinds of owners (the proprietor, the public, or the foreigner) had obviously effects on Emc, while the effects of ownership shares of the managers, of the government, or of the legal person on Emc, were proved again.

5.DISCUSSION AND CONCLUSION

From the analysis above, all the hypothesis are proved except for hypothesis 5(d).

The proved results, that Ta and Emc are positively related to Inte, conform to traditional theory. From the innovation theory, innovation is an important function of the managers, therefore, the talent of the manager and the extent of his care to the owners benefit will influence firm technical innovation. And from the agency theory, the managers' talent is the premise of agency relationship between the owners and the managers, and once the managers are hired, the extent of managers' care to owners' benefit will has influence on Inte. From the view of corporate resource, the managers' human resource is a kind of rare resource, so Ta and Emc can also be regarded as rare resource in the innovation activity; according to the law of diminish of marginal benefit, increment of Ta and of Emc will contribute to Inte. Besides, in model 1 or in model 2, β of Emc is bigger than β of Ta, this may implies that, as for technical innovation of Chinese firms, the attitude of the managers to owner's benefit may be more important than the managers' talent.

The analytical result on Emc conform to agency theory. From the point of agency, when a manager is a owner of the enterprise, he is the initial creditor of his own, and the agency levels between initial creditor(the manager, when he is the owner) and the enterprise is less ; but to the government owner, the agency levels between its initial creditor(the public, that are the owners) and the enterprise is more. Therefore, the supervising efficiency of the government owner to Emc is lower than that of the manager owner to Emc. As for the legal person owners, the agency levels between their initial creditor and the enterprise is less than that of the government owner; besides, the legal person owners appeared with Chinese economy system reforming, attention from the government and the society forces the managers to care about the owners' benefit much more.

The point of agency theory cannot explain the analytical result on Ta. From the agency theory, the agency levels between the initial creditors of the government owner and the enterprise is more, and that between the initial creditor of the public and the enterprise is relatively less. But the research result shows that the fraction of ownership share of government is positively related to Ta, and that of the public is negatively related to Ta. The theory of study tells us that people's talent is the result of their study(Garvin, D. A., 1993), so the manager's talent may come from his study before he was hired as the manager when the agency relationship between the owners and him didn't exist. Moreover, as the manager's talent may come from his study before he was hired, the owners can influence manager's talent by selecting person who has high talent to be the manager, and those owners that have the ability to select suitable person and are willing to pay the necessary selecting cost will influence Ta positively. Different from the owners' supervision on Emc, the cost in selecting suitable managers by owners is centralized in the period of selection, therefore when the government has more ownership shares it will be able to pay the cost and to select the high talent managers more efficiently by using the resources it masters; and when the public whose ownership share is scattered has more ownership share, the public owners as a whole cannot pay the centralized cost and cannot select the high talent managers efficiently.

The reason why hypothesis 5(d)(the positive effects of ownership shares of legal person on Ta) is not proved, may be that in period of economic reforming, the influence of ownership shares of legal person on Ta is indirect through Emc. To prove this point, we analyzed Model 3 by getting rid of Emc, and found that the effect of legal person' s ownership shares on Ta became marginally obvious when Emc was not included in Model 3, which means that Emc may undertake a mediating role between ownership shares of legal person and Ta. Especially, when we got rid of Emc in Model 3 and at the same time considered of the possible effects of industry stage on Ta, the effect of ownership shares of legal person on Ta became obviously positive.

From the research, we have the following conclusions:

1st. Both the talent of managers (Ta) and the extent of managers' care to owners' benefit (Emc) are positively related to corporate innovation in technology (Inte).

2nd. Ownership shares of the managers (Sm), of the government (Sg), of the proprietor (Spr), or of the foreigners (Sf), as well as Emc(extent of managers' care to owners' benefit), have all positive effects on the managers' talent(Ta); while ownership shares of the public has negative effects on Ta. Ownership shares of legal persons has no direct effects on Ta, but it has indirect effects on Ta through Emc.

3rd. The increment of the ownership shares of the managers or of the legal persons, will increase the extent of managers' care to owners' benefit (Emc), while that of the government will bring down Emc.

4th. Apart from the indirect influences of ownership shares on technical innovation (Inte) through managers' features (Emc and Ta), ownership shares of different kinds of owners have direct effects on Inte. In particular, ownership shares of managers has direct and positive effects on Inte, while that of the government or of the public has direct but negative effects on Inte.

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