

An Empirical Research on the Relationship Between Firm Ownership Structure and Technical Innovation: Taking Manager Features as Mediums¹

UNE RECHERCHE EMPIRIQUE SUR LA RELATION ENTRE LA STRUCTURE DE PROPRIETE D'ENTREPRISE ET L'INNOVATION TECHNOLOGIQUE :

PRENDRE LES CARACTERISTIQUES DES MANAGERS COMME MEDIAS

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Abstract: The empirical research on the relationship between firm ownership structure and technical innovation is weak in existing research. Based on existing research result, this article empirically studies the influence of manager on relationship between firm ownership structure and technical innovation, by analysing a large sample database. It proves that firm manager is the important link between firm ownership structure and technical innovation.

Keywords: ownership structure; attitude of manager; talent of manager; firm technical innovation

Résumé: La recherche empirique sur la relation entre la structure de propriété d'entreprise et l'innovation technologique est faible dans les recherches existantes. Basée sur le résultat de recherches existantes, cette thèse fait une recherche empirique sur les influences des managers sur la relation entre la structure propriétaires d'entreprises et l'innovation technologique en analysant une donnée exemplaire immense. Elle prouve que les managers des entreprises sont les liaisons importantes entre la structure de propriété d'entreprise et l'innovation technologique.

Mots-clés: Structure propriétaire, attitudes des managers, talents des managers, l'innovation des entreprises technologiques

Both firm ownership structure and technical innovation can influence firm achievement. But, research on the relationship between ownership structure and technical innovation of a firm (for example, which factor can influence the relationship) is rare [1] [2]. In this article, basing on existing research result, the author will empirically studies the influence of managers on relationship between ownership structure and technical innovation by analyzing Chinese firms.

Particularly, the paper will prove that managers' features can both strengthen the relationship between ownership shares of managers and firm technical innovation, and the relationship between ownership shares of government and firm technical innovation. Therefore, the paper will prove that the managers' features (in this paper, it means managers' care to owners benefit, and the managers' talent) can be regarded as important mediums between ownership

structure and firm technical innovation.

The following is the methods and the process for proving these points.

1. METHODS

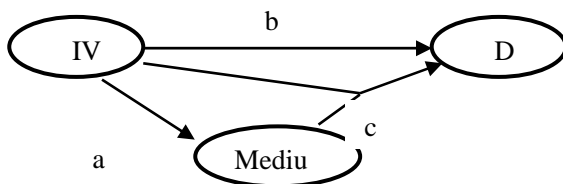
We use the widely approved method provided by Baron and Kenny (1986) to test the influence of manager features on the relationship between firm ownership structure and technical innovation. In their paper, Baron and Kenny argued that the mediums will strengthen the relationship between independent variables(IV) and dependent variables(DV) if the following four conditions are met[3] (Figure 1):

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Figure 1. Conditions for the mediums to influence the relationship between independent variables (IV) and dependent variables (DV)



- (1) Independent variables (IV) influence the mediums in (a);
- (2) Independent variables (IV) influence dependent variables (DV) in (b);
- (3) Mediums influence dependent variables (DV) in (c);
- (4) Lastly, the influence of IV on DV in (c) is smaller than that in (b), which means the influence of IV on DV declines when we take mediums into account.

In this paper, firm ownership structure is independent variable (IV), firm technical innovation is dependent variable (DV), and manager features are mediums. Besides, firm ownership structure is expressed by the ownership shares of managers (Sm), of government (Sg), and of the public (Spu); and the managers' features include the extent of managers' care to owners' benefit (Emc) and the managers' talent (Ta).

Using statistic software (SPSS) and taking technical innovation as DV, we will test if above four conditions are met by regression analyzing. First of all, we now describe the relative data and the measure of variables.

2. DATA SOURCE AND VARIABLE MEASURE

2.1 Data Source

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 province. The involved industries include electronics, petrification, 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, and so on. 805 questionnaires were distributed and 607 valid questionnaires were returned back, which means that about 75% of the distributed questionnaires are valid. The collected data were judged and selected according as whether the data were unfeigned and valid. The judged and selected data were inputted into computer database to become the sample of our study.

2.2 Variable Measure

2.2.1 Dependent variable: Firm technical innovation (Inte)

Technical innovation includes product innovation and innovation on technical process. According to existing research [4][5], Inte in our research 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, which means the index is reliable.

2.2.2 Medium variables: Manager features (Emc, Ta)

The reason why the owners hire a manager is to make full use of the manager's talent; and when the manager is hired, the owners will ask the manager to pay enough care to owners' benefit. Therefore, manager features include two variables in our research: extent of managers' care to owners' benefit (Emc) and talent of the managers (Ta).

Extent of 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): In this study, Ta is represented by the following aspects (Robin Snell, Agnes Lau, 1994; Chao C. Chen, et al., 1998) [6][7]: (i) the ability for the managers to accurately get information of market demand, (ii) time and energy which the managers spend in serving the clients, (iii) ability for the managers to accurately judge the change in market demand, (iv) the ability for the managers to catch the business chance, (v) the ability for 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, which means the index is reliable.

2.2.3 Independent variable: Ownership shares of every kind of owners (Sm, Sg, Spu)

In this paper, ownership structure is expressed by Sm, Sg, and Spu (which respectively stands for the fraction of ownership shares of managers, of government, and of the public). According to existing research [8], they are respectively valued by averaging the fraction of ownership shares of the relative owners in 1997, 1999, and 2001 in enterprises.

2.2.4 Control variable: Corporate size (Size)

Variable Size (Size) in our study is a control variable. According to Tosi and Katz [9], Size in our study is a composite index constructed from assets, sales, and number of employees by factor analysis. And α in reliable analysis is 0.7164; KMO is 0.717, which means the index is reliable.

3. PROCESS AND RESULT

Now we test if above four conditions are met.

Table 1 Result of the Test

DV \ IV	Model 1 Emc	Model 2 Ta	Model 3 Inte (no medium variables)	Model 4 Inte (with medium variables)
Sm	0.090**	0.128***	0.105***	0.086**
Sg	-0.157***	0.072*	-0.102***	-0.089**
Spu	0.063	-0.042	-0.089**	-0.094**
Emc	-----	-----	-----	0.115***
Ta	-----	-----	-----	0.071*
Size	0.137***	0.114***	0.357***	0.333***
F	9.157***	4.364***	25.230***	19.490***
Adjusted R2	0.134	0.132	0.138	0.155

Note: * means sig. is smaller than 0.1, ** means sig. is smaller than 0.05, *** means sig. is smaller than 0.01

Condition 1. In model 1 (Table 1), Emc is a dependent variable, Sm, Sg and Spu are independent variables, Size is a control variable; In model 2 (Table 1), Ta is a dependent variable, Sm, Sg and Spu are independent variables, Size is a control variable. Using statistic software (SPSS), we respectively analyze if the independent variables influence the dependent variables in two models by regression analyzing. The results are in table 1. The results show that the ownership shares of managers(Sm) positively influence Emc and Ta (β is respectively 0.090 and 0.128, and sig. is smaller than 0.05 in both the models); the ownership shares of government (Sg) negatively influence Emc (β is -0.157, and sig. is smaller than 0.01) and positively influence Ta (β is 0.072, and sig. is smaller than 0.1). In both the two models, F is significant, which means the two models are valid. In the two models, independent variables and control variable can respectively explain 13.4% and 13.2% of the dependent variable.

Therefore, independent variable Sm and Sg significantly influence medium variables Emc and Ta, which means Sm and Sg meet condition (1).

Condition 2. In model 3 (Table 1), Inte is a dependent variable, Sm, Sg and Spu are independent variables, Size is a control variable. Using statistic software (SPSS), we analyze if the independent variables significantly influence the dependent variable in the model by regression analyzing. The results show that the ownership shares of managers(Sm) positively influence Inte (β is 0.105, and sig. is smaller than 0.01); the ownership shares of government (Sg) negatively influence Inte (β is -0.102, and sig. is smaller than 0.01). In the model, F is significant, which means the model is valid; and independent variables and control

variable can explain 13.8% of the dependent variable.

Therefore, when medium variables are not taken into account, both independent variable Sm and Sg can influence dependent variable Inte significantly, which means Sm and Sg meet condition (2).

Condition 3. In model 4 (Table 1), Inte is a dependent variable, Sm, Sg, Spu, Emc and Ta are independent variables, Size is a control variable. Using statistic software (SPSS), we analyze if the independent variables significantly influence the dependent variable in the model by regression analyzing. The results show that both Emc and Ta positively influence Inte (respectively, β is 0.115 and 0.071, and sig. is smaller than 0.1 for both the two variables Emc and Ta). In the model, F is significant, which means the model is valid; and independent variables and control variable explain 15.5% of the dependent variable.

Therefore, medium variables (Emc and Ta) significantly influence dependent variable Inte, which means condition (3) is met.

In above analysis, we calculate VIF value of each variable with SPSS software, and find each VIF value is smaller than 1.5, smaller than 10 which are recommended by Mason and Perrault [3]. This means the interaction of variables doesn't interfere the result in each model.

Condition 4. When we respectively compare β of Sm or β of Sg in model 4 with that in model 3, we find that in model 4, the influence of Sm or of Sg on dependent variable Inte is smaller than that in model 3 (0.086 is smaller than 0.105, and the absolute value of -0.089 is smaller than that of -0.102).

Therefore, when medium variables Emc and Ta are

taken into account, the influence of Sm and Sg on dependent variable Inte declines, which means condition (4), is met.

Above statistic analysis shows that all the 4 conditions are met when Sm and Sg are the independent variables, Emc and Ta are the medium variables, and Inte is a dependent variable. Therefore the viewpoint we provided in the beginning of this paper is proved: manager features (extent of manager's care to owners' benefit, and manager's talent) can actually strengthen the relationship between technical innovation (Inte) and ownership shares of managers(Sm), and the relationship between technical innovation and ownership shares of government (Sg).

4. CONCLUSION

For the viewpoint those managers' features influence the relationship between firm ownership structure and technical innovation, our research in this paper provides empirical support by statistically analyzing the data in our sample.

Specifically, manager features (Emc and Ta) can strengthen the positive relationship between ownership shares of managers (Sm) and technical innovation (Inte), and the negative relationship between ownership shares of government (Sg) and technical innovation (Inte). In other words, the positive influence of Sm on Inte and the negative influence of Sg on Inte, are partly caused by manager features.

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