

# The Relationship between Managerial Discretion and Firm Performance in High-tech Firms—Empirical Study Compared with Traditional Firms

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**Abstract.** This paper explores the relationship between managerial discretion and firm performance in Chinese listed firms. Empirical results indicate that the relationship between managerial discretion and firm performance differs across firms belonging high-tech sector and traditional industry. Managerial discretion is negatively related to firm performance in traditional companies. By contrast, in high-tech firms, with large share of knowledge related activities, higher managerial discretion is associated with better firm performance.

## Introduction

High-tech firms have distinct characteristics differing from traditional companies. High-tech firms invest in R&D constantly in order to create and apply advanced knowledge for product and process innovations. Their primary assets are the possession of patents, copyrights and promising technicians. But tangible assets such as plants and equipments are considered as main operating resources in traditional enterprise. Audretsch and Lehmann(2002) consider that analyzing the relationship between managers and shareholders requires different perspectives in firms belonging to the sector of “new” economy and in firms belonging to more traditional industry[1]. Rajan and Zingales(2000) argue that “new economy” firms need new corporate governance mechanisms to stimulate the innovation potential of human capital [2]. Managerial discretion is an important element of corporate governance mechanism. Since intellectual capital becomes the most important strategic resource for high-tech firms, should high-tech firms arrange different managerial discretion from traditional enterprise?

In order to investigate this issue, this paper use one sample stand for high-tech industry and another sample stand for traditional industry respectively in China’s listed firms to study the relationship between managerial discretion and firm performance. The results indicate that the relationship between managerial discretion and firm performance differs across high-tech industry and traditional industry. In high-tech firms, managerial discretion has a significant positive correlation with firm performance. In contrast, managerial discretion is negatively related to firm performance in traditional companies.

## Literature Reviews

Managerial discretion is defined as the degree of executives’ influence to firms’ operating decision-making. It shows the scope of CEO’s decision-making power. Research on this issue dates back to Berle and Means (1932), who argue that managers’ objectives often differ from the firm’s goal of maximizing profits, therefore managerial discretion is likely to be associated negatively with firm performance[3]. Pfeffer & Salamcik (1978) also believe that managerial discretion allows managers to serve their own interests rather than shareholders’ objective, so managerial discretion has a negative correlation with firm performance[4]. Many studies have conducted empirical studies on relationship between managerial discretion and firm performance. Some studies support the negative performance implications of managerial discretion (e.g. Williamson 1963, Baysinger and Butler 1985, Denis et. al.1997, Brush et al. 2000) [5]. Yet Boycko & Shleifer (1996) find that managerial discretion has a positive correlation with firm performance in state-owned enterprise because managers of state-owned firms pay more attention to firm performance than politician[6]. Eric & Sonia (2003) take Chinese listed firms as samples and they find that managerial discretion is positively related to firm performance if firm has higher ownership concentration, and that managerial discretion is unrelated to firm performance if firm has lower ownership concentration.

Xiangkang Yin (2004) confirms that managerial discretion's influence on firm performance depends on matching of competition category of product market and manager's type[7].

Existing evidence about the relationship is inconclusive. The impact of managerial discretion on firm performance has cost effect and returns effect simultaneously and managerial discretion's influence on firm performance depends on the nature of shareholders, competition category and so on. In an era of knowledge-based economy, high-tech firms have many different characteristics from traditional firms such as high risk, high growth, mainly possessing intellectual capital and intangible assets. Therefore the relationship between managerial discretion and firm performance in high-tech firms may be quite different from traditional firms, but by now, there is little empirical study about it.

## **Theories and Hypotheses**

In modern enterprises which management rights are separated from owning rights, agency problem arises due to the inconsistent interests of shareholders and managers as well as information asymmetry. Shareholders develop various strategies to prevent managers from using their decision-making discretion to pursue self-serving objective. They may strengthen the supervision or strict power and responsibility to prevent opportunistic behavior of the manager. But because of the fierce market competition and more specialized skills of management, managers need more decision-making power to respond in a rapidly changing environment. If managers are supervised and intervened excessively, it will reduce their enthusiasm and initiative of looking for investment opportunities, which will be detrimental to firm performance. On contrary, a certain degree of discretion could motivate managers' executive ability and creative potential, thereby enhancing firm performance.

In traditional industries, operation and management of firms become increasingly mature, external environment is relatively stable too. Shareholders clearly know what action should take about operating and producing, so there is no need to give managers more decision-making power. Excessive managerial discretion may lead managers to pursue self-serving objective. However, high-tech industries are in front of the rapid development technology and market changing. In such highly uncertain and complex environment shareholders may not be clear which is the right R & D strategy or the right investment projects, so supervision effect will be greatly reduced. Moreover, initiative and creativity are essential to the survival and development of high-tech firms. If managerial discretion is restricted, it will undermine the manager's initiative. Higher managerial discretion may enable manager maintaining sufficient confidence to take advantage of their initiative and creativity, therefore firm performance will be improved. Based on above theoretical analysis, the paper offers the following hypothesis:

H1: Managerial discretion has positive impact on firm performance in high-tech firms.

H2: Managerial discretion has negative correlation with firm performance in traditional firms.

## **Data and Methods**

### **Measures**

#### **1) firm performance**

This paper takes Tobin's Q as the measurement of firm performance. Tobin's Q is calculated as the ratio of market value of equity plus book value of total debt to book value of total assets. High-tech firms' stock price generally is higher than traditional firms because of high-growth and high-risk nature. It leads to that their Tobin's Q are different, which could affect the credibility of the empirical results. So use the ROA as proxy variable of firm performance for robust test. ROA is calculated as the ratio of net profit to book value of total assets.

#### **2) managerial discretion**

The role of managers is quite complex which leads managerial behavior and their discretion latitude can not be accurately observed. So researchers generally use indirect indicators to measure managerial discretion. For example, Aghion & Tirole (1997) consider that the higher ownership

concentration means large shareholders have more power to control CEO which will restrict managerial discretion [8].

The complexity of managerial discretion means that multiple index method is superior to any single index method. CEO is the most important person in making key decisions in a company, so mainly study the discretionary power of CEO. According to previous research, this paper measures the discretionary power of CEO by the average value of the standardized position power index, salary power index and ownership dispersion index. The definitions and the measures are as following:

a) Position power index means the power related with the position itself. The measure of this index is the reciprocal of the number of directors whose position is higher than CEO in the board. The larger this reciprocal value, the more the position power seems to be, and the more discretionary power the CEO may hold.

b) Salary power index reflects the power of CEO by their salary levels. The measure of this index is the ratio of the CEO salary to the highest salary in the board, which is contrast to Li (2003) measures the discretionary power of CEO as the ratio of the CEO salary to the lowest salary. The higher this ratio, the more important the CEO may be in the company, and the more discretion he or she may has.

c) Ownership dispersion. The measure of this index is 1 subtract the sum of squared share percent of top 5 shareholders. The higher this ratio, the more disperses of ownership, and more discretionary power the CEO may hold.

The discretionary power of CEO is measured as the average value of the standardized position power index, salary power index, and ownership dispersion index. It can comprehensively reflect the degree of managerial discretionary power.

### 3) control variables

Following previous studies, this paper uses debts to assets ratio, total assets turnover, natural logarithm of total assets as control variables to filter out their effect on firm performance. In addition, Year dummies and industry dummies are included to control common macroeconomic and industry difference. Table 1 shows all the measures.

Table1 Denitions and measures of the variables.

Variable	Description	Name
Firm performance	Market value / total assets	TQ
	Net profit / total assets.	ROA
Managerial discretion	Position power index	PD
	Salary power index	SD
	Ownership dispersion	OD
	The average value of the standardized	MD
Control variables	Total liabilities / total assets	Lev
	Total incomes/total assets	Turn
	Ln(total assets)	Size

### Data

The samples are from high tech firms and traditional firms Listed in Shanghai Stock Exchange and Shenzhen Stock Exchange in China between 2007 and 2008. According to industry classification standard of CSRC(China Securities Regulatory Commission), select high-tech firm samples from information technology, medicine and bio-products, and electronic industry. Majority of firms within these industries have established R&D institutions, possessing patents, software copyrights and other intellectual property rights. Excluding firms of data extreme abnormal and ST firms, the sample of high-tech firms consists of 304 firm-year observations. Firms in extractive industry, wholesale and retail trade, textile, food industry are selected as samples of traditional firms. Firms belong to these four sectors are labor- intensive and have mature operating experiences

which are contrary to high-tech firms. Excluding ST firms, 449 firm-year observations of traditional firm samples are obtained.

All firms' data of the study are from WIND database, Table 2 presents summary statistics for two group firms. Medians are in the table and standard errors in parentheses. The last column provides the t-statistics for the differences in means between the two categories of firms. Overall, Table2 shows that on average high-tech firms are smaller and Tobin's Q is higher than traditional companies. Position power index and Salary power index of high-tech firms are higher than traditional companies, whereas ownership dispersion of traditional firms is higher. The difference of Tobin's Q is significant at 1% level, but the difference of ROA is not significant.

Tale 2. Firm characteristics by type of firms: high-tech versus traditional

variable	High-tech firms	Traditional firms	difference
TQ	2.293 (1.437)	1.845 (0.959)	3.693***
ROA	8.010 (7.527)	8.275(8.962)	0.306
PD	0.483(0.313)	0.430(2.240)	-1.899**
SD	0.443(0.103)	0.294(0.063)	-17.669***
OD	0.557(0.103)	0.818(0.132)	20.962***
Lev	0.358(0.175)	0.477(0.178)	-6.621***
Turn	0.773(0.419)	1.085(0.930)	3.971***
Size	21.006(0.860)	21.677(1.270)	5.809***

## Test and Results

First, the paper analyzes the Pearson Correlations between managerial discretion and firm performance. Result show that correlation coefficients between MD and firm performance (both Tobin's Q and ROA) are positive in high tech firms. In contrast, the coefficients of traditional firms take opposite signs. The correlation between managerial discretion and firm performance is expected.

Then employ multiple-linear-regression analysis to test the correlation between managerial discretion and firm performance. Model(1) tests the correlation between managerial discretion and Tobin's Q , Model(2) uses ROA as proxy variable of firm performance for robust test. The models are as follows:

$$TQ = a_0 + a_1MD + a_2Lev + a_3Turn + a_4Size + a_5Year + a_{6i} \sum_{i=1}^{i=n} Industry + \varepsilon \quad (1)$$

$$ROA = a_0 + a_1MD + a_2Lev + a_3Turn + a_4Size + a_5Year + a_{6i} \sum_{i=1}^{i=n} Industry + \varepsilon \quad (2)$$

Where MD denotes managerial discretion, Lev denotes debts to assets ratio, Turn denotes total assets turnover, Size denotes natural logarithm of total assets, Year and Industry are dummy variables.

The test results which are shown in Table 3 reveal that all models are statistically significant(all  $p < 0.01$ ). In high-tech group, managerial discretion is positively and significantly correlated with Tobin's Q ( $P < 0.05$ ) and ROA( $P < 0.1$ ), H1 is confirmed. The results suggest that higher managerial discretion in high tech firms could enhance firm performance. High-tech firms' managers mostly are very important person in technical staff. Facing the challenge of rapidly changing technology and market, they must take actions initiatively and quickly. Managers who are less interfered and restricted from shareholders could make decision correctly and quickly according to changing circumstance, thereby improve firm performance. If shareholders take excessive supervision and intervention to manager, it might affect managers' enthusiasm and initiative to create and may not good for improving firm performance.

Regression results in traditional industries' group are in contrast with high-tech group, which support to H2. The coefficient between managerial discretion and Tobin's Q is negative, but not significant. However, the coefficient between managerial discretion and ROA is negative and significant ( $p < 0.01$ ). The results reveal that managers with higher managerial discretion usually resort to opportunistic behavior in traditional firms, thus firm value is declined. Hence, in traditional firms, the findings are consistent with agency theory which views managerial discretion as an opportunity for managers to serve their own objectives rather than the objectives of shareholders.

Table 3 . Results of regression

Variable	Model (1)		Model (2)	
	High-tech firms	Traditional firms	High-tech firms	Traditional firms
MD	0.282**(1.971)	-0.033(-0.223)	1.029*(1.658)	-1.739***(-2.627)
Lev	-0.035***(-6.576)	-0.024***(-5.005)	-0.240***(-10.319)	-0.115***(-5.386)
Turn	0.099(0.518)	0.267***(2.996)	2.299**(2.776)	1.718***(4.252)
Size	-0.484***(-4.83)	-0.107(-1.411)	1.414***(3.250)	1.087**(3.146)
N	304	449	304	449
Adjusted R2	0.369	0.319	0.283	0.251
F statistic	26.335	27.242	18.101	19.787

## Conclusion

The relationship between managerial discretion and firm performance is different in firms belonging to the sector of innovative technologies and in traditional firms. For the latter, the results give support agency theory that higher managerial discretion is associated with lower performance. By contrast, in high-tech firms, with large share of knowledge related activities, higher managerial discretion is associated with higher firm performance.

The findings imply that shareholders of high tech firms should give managers sufficient discretion power to respond rapidly changing environment. High tech firms' manager have more decision making power could help improve firm performance, therefore promoting the development of high-tech enterprises. Of course, the findings based on the data from listed firms that may not be the same as the non-listed companies. Furthermore, the proxy variables of managerial discretion may use more appropriate indicators. So these issues need to be further explored in future studies.

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