

# An Empirical Analysis of the Influence of Board Characteristics on the Profitability of Pharmaceutical Industry

Yacui Gao<sup>1, a</sup>, Xin Li<sup>1, b</sup>

<sup>1</sup>School of Xi'an University of Science and Technology, Xian 710000, China.

<sup>a</sup>326619664@qq.com, <sup>b</sup>851471542@qq.com

## Abstract

The paper takes panel data of 139 pharmaceutical manufacturing listed companies as samples during the period of 2014 to 2017, to make an empirical research on influential factors to the profitability of the listed companies in this industry, such as integrated title of chairman and general manager, scale of board of directors, independent director ratio, shareholding ratio of board of directors, executive compensation, meeting frequency of board of directors and so forth. Through constructing diverse regression model to make arrangement analysis to correlation of influential factors and found that the correlation between shareholding proportion of board of directors, executive compensation and profitability is positive; independent director ratio, the correlation between meeting frequency of board of directors and profitability is negative; however, integrated title of chairman and general manager and scale of board of directors have no connection with profitability.

## Keywords

Pharmaceutical industry, Board of directors, Profitability.

## 1. Introduction

Board of directors is the core system of company governing, which provides service for solving profitable conflicts between decision-maker and residual risk bearer brought by separated ownership and right of management. Board of directors has right to authorize, dismiss executives and decide executive compensation, while making strategic decision, making company's policy and system and performing supervisory obligation, it plays an important significance to enterprise's profitability.

Pharmaceutical industry is called as permanent "sunrise industry" and accounts a prominent position in various countries' industrial system, especially in developed countries. Pharmaceutical industries are different from traditional industrial fields, its industrial characteristics are high investment, high reward, long research and development time and large risk. The paper makes descriptive statistics and correlative analysis to various features of board of directors of Chinese 149 listed companies in pharmaceutical industry and states influence of various characteristics of board of directors to company's profitability.

## 2. Theoretical Analysis and Research Hypothesis

### 2.1. Research Hypothesis

Integrated title of chairman and general manager and company's profitability. Agent theory thinks that it needs an effective supervision mechanism in order to prevent agent's "bad moral behavior" and "indirect selecting". Integrated title of chairman and CEO means board of directors is difficult to make effective supervision to manager layer, hence the title of chairman and CEO should be set separately in order to make board of directors have an effective supervision to manager layer. Therefore, the paper hypothesizes:

Hypothesis 1: the correlation between integrated title of chairman and CEO and company's profitability is negative.

Scale of board of directors and company's profitability. The large scale of board of chairman is, the better board of directors can embody its supervisory function, but gradual expansion of scale of board of directors will bring problems as well, such as difficult coordination, delay decision and so forth, and its cost may be larger than profit brought supervision to a large extend. Therefore, the paper hypothesizes:

Hypothesis 2: correlation between scale of board of directors and company's profitability is negative.

Independent director proportion and company's profitability. Independent director's function to company embodies in two ways: one is to provide decision and suggestion. Independent director usually has professional knowledge in economy, management, financial and so forth and be able to provide decision and suggestion for company. The other is to execute supervisory function. Independent director has relatively independent identity and doesn't controlled by other directors and chargers, it can supervise behavior of other directors and chargers to some extend. Hence, the paper hypothesizes:

Hypothesis 3: the correlation between independent director proportion and company's profitability is positive.

Shareholding proportion of board of directors and company's profitability. Oon the one hand, company's collective stock right can produce beneficial influence to company's profitability; on the other hand, it will also make board of directors serve for the interests of strong stock holders more and invade interests of weak stock holders which is not beneficial to company's profitability. Pharmaceutical manufacturing industry has characteristics of high investment, high reward, long research and development time and large risk, company's collective stock right is more beneficial to various decisions. Hereby, the paper hypothesizes:

Hypothesis 4: the correlation between shareholding proportion of board of director and company's profitability is positive.

Executive compensation and company's profitability. Executive compensation not only can restrict executive but can attract more talents, meanwhile, it can improve management performance, so that to increase fortune of shareholders, compensation stimulation to board of directors will make directors strive for performing their own obligations for compensation. Therefore, the paper hypothesizes

Hypothesis 5: the correlation between executive compensation and company's profitability.

Meeting frequency of board of directors and company's profitability. Meeting frequency of board of directors can represent activity degree of board of directors, too frequency of meeting may be an abnormal operation status and tend to indicate that board of directors performs practically no function and cannot perform its due function. Hence, the paper hypothesizes:

Hypothesis 6: the correlation between meeting frequency of board of directors and company's profitability is positive.

## **2.2. Research Design**

### **2.2.1. Sample Selection and Data Origin**

The paper selected pharmaceutical manufacturing according to Guidelines on the Classification of Industry by the Commission and the Industrial Classification of Listed Companies released China Securities Regulatory Commission (CSRC) in 2012. In order to guarantee effectiveness of sample data and remove the companies which were "ST" and "PT" in any year within time interval, companies with incomplete data and companies listed in 2014. finally, to screen 417 data samples for three years from 139 companies. The data origin is from Cathay Pacific database.

### 2.2.2. Selection Research Variable

**Table 1.** Variable definitions

	Variable	Variable interpretation
Dependent variable	Total asset net interests rate	Total asset net interest rate=net profit/average asset amount*100%
	Concurrent post situation of chairman and general manager	When chairman and general manager integrated, the value is 1, or 0
	Scale of board of directors	Total number of board of chairman
	Independent director proportion	Independent director quantity/total number of board of directors
Argument	Shareholding proportion of board of directors	Shareholding quantity of board of directors/total shares
	Executive compensation	Total amount of directors, supervisor and executive compensation
	Meeting frequency of board of directors	Meeting frequency of board of directors in fiscal year

### 2.2.3. Researching Model

Total asset net interest rate $it = \alpha + \beta_1$ concurrent situation $it + \beta_2$ scale of board of directors $it + \beta_3$ independent director proportion $it + \beta_4$ shareholding proportion of board of directors $it + \beta_5$ executive salary $it + \beta_6$ meeting frequency of board of directors $it + \epsilon it$ .

## 3. Empirical Checkout and Analysis

### 3.1. Descriptive Statistics

**Table 2.** Descriptive statistical analysis

	Concurrent situation of chairman and general manager	Scale of board of directors	Independent director proportion	Shareholding proportion of board of directors	Executive compensation	Meeting frequency of board of directors	Total assets net profit rate
Average	0.30	8.56	0.369	0.133	12.494	9.90	0.074
Standard deviation	0.458	1.531	0.0504	0.192	0.659	4.277	0.065
Minimum	0	5	0.250	0	10.375	4	-0.286
Maximum	1	15	0.600	0.894	15.346	35	0.269

Table 1 is descriptive analysis of various variables of sample companies. We can know from table 1 that 70% companies' posts of chairman and general manager are separated in all sample companies, board of directors can make effective supervision to management layer; our country stipulates that company's independent director quantity should account one third of total number of board of directors, in sample companies, average proportion of independent directors reaches 36.9%, but minimum is only 25% which hasn't reached the lowest level of national requirement. Average of shareholding proportion of board of directors is 13.3%, but differences of various sample companies are large, shareholding proportion is from 0 to 89.4%.

### 3.2. Correlative Analysis

**Table 2.** Correlative analysis

	Total asset net profit rate	Concurrent posts situation of chairman and general manager	Scale of board of directors	Independent director proportion	Shareholding proportion of board of directors	Executive compensation	Meeting frequency of board of directors	
Pearson	Total assets net profit rate	1.000	0.028	0.017	-0.148	0.126	0.167	-0.124
	Concurrent posts situation of chairman and general manager	0.028	1.000	-0.253	0.210	0.169	-0.110	0.037
	Scale of board of directors	0.017	-0.253	1.000	-0.514	-0.069	0.196	-0.034
	Independent director proportion	0.148	0.210	-0.514	1.000	0.003	-0.066	0.073
	Shareholding proportion of board of directors	0.126	0.169	-0.069	0.003	1.000	-0.109	0.101
	Executive compensation	0.167	-0.110	0.196	-0.066	-0.109	1.000	0.240
	Meeting frequency of board of directors	0.124	0.037	-0.034	0.073	0.101	0.240	1.000
Sig.	Total asset net profit rate	0.286	0.369	0.001	0.005	0.000	0.006	
	Concurrent posts situation of chairman and general manager	0.286	0.000	0.000	0.000	0.013	0.229	
	Scale of board of directors	0.369	0.000	0.000	0.080	0.000	0.245	
	Independent director proportion	0.001	0.000	0.000	0.474	0.090	0.068	
	Shareholding proportion of board of directors	0.005	0.000	0.080	0.474	0.014	0.020	
	Executive compensation	0.000	0.013	0.000	0.090	0.014	0.000	
	Meeting frequency of board of directors	0.006	0.229	0.245	0.068	0.020	0.000	

We can know correlation of independent director proportion, shareholding proportion of board of directors, executive compensation, meeting frequency of board of directors and total asset net interest rate from table 2, they all have statistical meaning ( $P < 0.05$ ). Among of them, the correlation between independent proportion, meeting frequency of board of directors and total asset net interest rate is negative, correlation coefficient are 0.148 and 0.124 respectively. Research result is nor confirmed with hypothesis 3 and hypothesis 6; the correlation between shareholding proportion of board of directors, executive compensation and total asset net interest rate is positive, correlation coefficient are 0.126 and 0.167 respectively, hypothesis 4 and hypothesis 5 are testified and verified. Concurrent posts situation of chairman and general manager, concurrent posts situation of chairman and general manager and the correlation between scale of board of directors and total asset net interest rate have no statistical meaning ( $P < 0.05$ ), hence, hypothesis 1 and 2 should be refused.

### 3.3. Regression Analysis

**Table 3.** Regression results of various variables and total asset net profit

Model	Non-standardized coefficient		standard coefficient	t	Sig.
	B	Standard error	Trial version		
(constant)	0.210	0.041		5.061	0.000
Concurrent posts situation of chairman and general manager	0.007	0.007	0.046	0.936	0.350
Scale of board of directors	-0.005	0.002	-0.111	-1.963	0.050
Independent director proportion	-0.245	0.073	-0.185	-3.367	0.001
Shareholding proportion of board of directors	0.053	0.016	0.157	3.270	0.001
Executive compensation	2.411*10 <sup>-9</sup>	0.000	0.245	4.920	0.000
Meeting frequency of board of directors	-0.003	0.001	-0.191	-3.908	0.000
R2			0.112		
F			8.497**		

Remark: \*\* $P < 0.001$

From the result of correlation analysis, correlation of many arguments and dependent variables has statistical meaning and can be analyzed from multiple regression and research influence of argument to dependent variable. Taking total asset net interest rate as argument and dependent director proportion, shareholding proportion of board of directors, shareholding proportion of board of directors, executive compensation, meeting frequency of board of directors as arguments to make multiple linear regression analysis, the result is showed in table 3. Model's goodness of fit is 0.112. F statistical value is 8.497 ( $P < 0.001$ ), and model D-W test indicated that model has no multiple collinearity and sequence correlation. Therefore, it can think that model's goodness of fit is favorable. According to table 3, it can conduct regression formula of sample:

Total asset net interest rate $it=0.21+0.007*concurrent\ situationit-0.005*scale\ of\ board\ of\ directorsit-0.245*proportion\ of\ independent\ directorit+0.053*shareholding\ proportion\ of\ board\ of\ directorsit+2.411*10^{-9}*executive\ compensationit-0.003*meeting\ frequency\ of\ board\ of\ directorsit$

According to regression result of model, there is no obvious correlative relation between concurrent situation of chairman and general manger, scale of board of directors and company's profitability. As to other influential factors taken into analysis, independent director ratio, shareholding proportion of board of directors, executive compensation, meeting

frequency of board of directors have an evident correlation ( $P < 0.05$ ) with total asset net interest rate or profitability of listed companies in pharmaceutical industry. Among of them, independent director ratio plays a large role to profitability of pharmaceutical manufacturing companies; second is shareholding proportion of board of directors, then meeting frequency of board of directors; final one is executive compensation's influence on enterprise's profitability which places at fourth place.

#### 4. Conclusion

The paper researched 139 listed companies in pharmaceutical industry from 2014 to 2017 and made empirical research on influential factors to profitability of listed companies in pharmaceutical industry, such as integrated titles of chairman and general managers, scale of board of directors, independent director proportion, shareholding proportion of board of directors, executive compensation, meeting frequency of board of frequency and so forth. It conducted following conclusions:

Firstly, company's independent director proportion and profitability have an obvious generative correlation. Independent director has rich commercial experience and ability of applying technology and market knowledge and be authorized to select, supervise, check, award or punish company's management layer, be able to safeguard company's interest through alleviating interest conflict between management layer and shareholders, so that to help company's management layer to solve operation problems. However, research result indicated that correlation of dependent director proportion and company's profitability is negative. That may because independent direct is only for meeting supervision requirement and independent director employment is mainly decided by majority shareholders and executives, independence of independent director is restricted and hasn't embodied its due function.

Secondly, company's shareholding proportion of board of directors and profitability are positive. Under principal-agent framework, improving shareholding proportion of board of directors is beneficial to realize incentive compatibility between members of board of directors and shareholders, different groups in board of directors will be prone to reach clear co-sharing target. Collective stock right is beneficial to enhance supervision to management layer and be able to alleviate problem of weak shareholders "thumb a lift", so that to decrease agency cost and improve company's compatibility.

Thirdly, company's executive compensation and profitability are positive. Company's stimulative way to senior chargers is subject to material stimulation and spiritual stimulation, traditional material stimulation means funds and bonuses for senior chargers, through improving executive compensation to decrease the possibility of their "bad moral behavior" and "indirect selecting". Higher compensation may attract more excellent talents to participate in, all these are beneficial to improve company's profitability.

Fourthly, company's meeting frequency of board of directors and profitability are negative. Convening board of directors meeting makes directors have more time to exchange, make strategy and supervise manager layer. In the other hand, convening board of directors meeting needs cost, including time of manager layer, travel charges, meeting fees of board of directors and so forth. Less or more meeting frequency of board of directors is not beneficial to enterprise's performance improvement, only proper quantity of board of directors meeting will be beneficial to improve enterprise's performance.

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