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Effects of board attributes on Chinese pharmaceutical firms

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Using longitudinal data of 49 Chinese pharmaceutical firms over a 4-year period between 2003 and 2006, this study investigates the effects of outside directors and board directors' age on firm performance. We find that board directors' age is positively related to firm performance but outside director is negatively related to firm performance. Further, we find that the interaction of board age and outside directors is significantly related to performance.

Field of Research: Strategic Management

1. Introduction

A central theme of corporate governance research is to investigate the effects of board attributes on strategic decisions and firm performance. Zahra and Pearce (1989) cluster board attributes into four broad categories: board composition, board characteristics, board structure, and board process. Board composition refers to board size and outside directors vs. inside directors. Board characteristics refer to the various characteristics of board directors such as directors' functional backgrounds, experience, personality and stock ownership. Board structure includes board organization, and task division. Board process refers to the decision making process such as board meeting frequency and consensus. These different board attributes are proposed to have distinct effects on the three primary board functions--service, resource, and monitoring.

This study focuses on the effects of outside directors pertaining to board composition and the effects of board age pertaining to board characteristics. Outside directors are the directors that are not employed by the focal firm. A great deal of research has studied outside directors (e.g. Baysinger, Kosnik, & Turk, 1991; Peng, 2003). Yet, the results of outside director effects are mixed. Some scholars find that outside directors are positively associated with firm performance. The explanations for such positive relationships are primarily based on agency theory, which argues that outside directors are more effective in their monitoring function due to outside directors' independence from CEO's authority. For example, Goodstein and Boeker (1991) find that the percentage of outside

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board directors is positively related to the greater strategic changes in the number of divestures and service additions in hospitals. Peng (2004) finds that outside directors are positively related to sales growth. However, other scholars find negative associations between outside directors and firm performance. For example, in a meta-analysis, Deutsch (2005) finds that the proportion of outside directors is negatively related to R&D intensity. Baysinger et al., (1991) find that inside directors (i.e. the opposite of outside directors) are positively related to R&D intensity. This line of reasoning suggests that inside directors may be more risk taking if they have higher presence on the board and thus are less concerned with the likely outcome based performance evaluation by outside directors. Such mixed results on the relationship between outside directors and firm performance suggest that the relationship may be context specific and further research is warranted.

Further, we investigate the effects of board directors' age on firm performance. Prior research has focused on characteristics of board directors such as the functional background of the board. For example, Stearns and Mizruchi (1993) studied the relationships between board directors' functional backgrounds and the firms' borrowing behaviors. They find that the presence of money market bankers and presence of insurance executives are positively associated with firms' short term borrowing behaviors. However, little research has examined the effects demographic characteristics of the board. Demographic variables of the board directors are critical to understand the effects of board directors. Hambrick and Mason (1984) proposed upper echelon (UE) theory and suggested that demographic variables of the top executives can help understand the values and cognitive bases, and consequently, firm behaviors and firm performance. In line with the UE theory, this study explores the effects of board age on firm performance. To the best of the authors' knowledge, the research on the relationship between the board directors' age and firm performance is scant at best.

Specifically, this exploratory study addresses three research questions: (1) how do outside directors affect firm performance in the context of a Chinese high-tech industry? (2) how does board age affect firm performance? and (3) does board age moderate the relationship between outside directors and firm performance? By investigating these questions, we intend to make two important contributions to the current corporate governance research. First, since the effects of outside directors may be context specific, studying the relationship between outside directors and firm performance in a Chinese high-tech industry extends the extant research. Second, given the scant research attention to the board demographics, by introducing board directors' age into corporate governance research, we can better understand how demographic variables of a board can affect the firm performance.

The rest of the paper is organized as follows. In section 2, the details of sample selection, data sources and measures are provided. Section 3 discusses the

statistical analyses and results. The final section concludes the paper with a brief discussion of its findings and limitations.

2. Methodology

Sample and data sources

Our data source is Sina.com (money.finance.sina.com.cn), which is a leading internet service provider in China. It publishes the financial information of all the publicly traded firms in China on a daily basis. We cross-validated the accuracy of Sina.com's data with Windin.com, GTA database and Chinese Securities Regulatory Committee website. We find that Sina.com's information is both reliable and accurate.

As an exploratory study, we collected data on a random sample of 50 publicly traded pharmaceutical firms between 2003 and 2006. The initial data collection resulted in 200 data points (i.e. 50 firms * 4 years). Based on the summary statistics of the variables, we eliminated one firm whose data were identified as outliers. Thus, our sample size of this pilot study reduced to 196 data points (i.e. 49 firms over 4 years).

Measures

Dependent variable We use the firm sales as a surrogate for firm performance. Peng (2004) also uses a firm sales related measure as a proxy for firm performance in his study of outside director effects on firm performance.

Independent and moderating variables Outside director, our first independent variable, was coded as the ratio of the outside director to the board size (Peng, 2004). Following upper echelon research, we use the average age of the board directors to operationalize board age. To test the moderating effect of board age on the relationship between outside directors and firm performance, we created an interaction term of board age and outside directors. To create the interaction term, following Cohen, Cohen, Aiken and West (2003), we first mean-centered the two independent variables and then multiplied the mean centered values.

We included three control variables—firm size, board size and CEO duality. Firm size is the accounting book assets. Board size is the number count of board directors. CEO duality is a dichotomous variable. When a CEO is also a board chairperson, we coded CEO duality as "1". Otherwise, it was coded as "0".

3. Analyses and Result s

Table 1 provides descriptive statistics. Table 2 shows the results of hierarchical multiple regressions. Model 1 is the baseline model which includes our three control variables firm size, board size and CEO duality.

To investigate our first research question of how outside directors affect firm performance, in model 2, the first independent variable, the percentage of outside directors was added to the regression. Model 2 is significant (P>.0001) but the R Square change was only marginally significance at P>.10 level. Given the limited sample size and nature of being a pilot study, we viewed this R Square change as significant. The coefficient of outside directors is negatively associated with firm sales at a marginal significance of P >.10 level.

Table 1: Means, standard deviation, and correlations

	Mean (SD)	**1**	**2**	**3**	**4**	**5**
1. Firm sales ($X10^9$ million RMB)	1.74 (2.29)					
2. Firm size	21.05 (0.91)	0.7340***				
3. CEO duality	0.16 (0.37)	-0.0797	0.0022			
4.Board size	10.99 (2.34)	0.1514*	0.2372***	0.0831		
5. Outsider director	0.36 (0.12)	-0.1571*	-0.1187	-0.0693	-0.1840**	
6. Board age	46.70 (4.24)	0.3410***	0.3577***	0.0375	0.1883**	0.0883

*P<0.05; **P<0.01; ***P<0.001

To study the second research question of how board age affects firm performance, model 3 included board age in addition to the previously added variables. Both the model 2 (P>.0001) and the R Square change are significant (P > .05). Also, the coefficient of board directors' age is positively related to firm sales at P >.05 level.

To explore the third research question of whether firm age moderates the relationship between outside directors and firm performance, model 4 included the interaction term of outside directors and board directors' age. Both model 4 (P>.0001) and the R Square change are significant (P > .05). The coefficient of the interaction term is significantly related to firm sales at P >.05 level.

Table 2: Hierarchical multiple regressions

	Model 1	**Model 2**	**Model 3**	**Model 4**
Constant	-37.08**	-36.00**	-36.41**	-36.23**
Firm size	1.86**	1.84**	1.75**	1.79**
CEO duality	-0.49	-0.52*	-0.55*	-0.48
Board size	-0.02	-0.03	-0.04	-0.05
Outside director		-1.74*	-2.04**	-1.94**
Board age			0.06**	0.03
Outside Director X Board age				-0.06*
R^2	0.5477***	0.5551***	0.5645***	0.5733***
R^2 Change		0.007*	0.009**	0.009**

*P<0.10; **P<0.05; ***P<0.001

4. Conclusions

Using longitudinal data of Chinese pharmaceutical firms, we find interesting relationships among outside directors, board directors' age and firm sales. First, we find that the proportion of outside directors is negatively related to firm sales. One explanation of such negative relationship is that when there is greater presence of inside directors, executives tend to be more proactive and risk taking in trying new products because their performance may be more likely assessed by the process oriented measures rather than outcome based measures. Second, board directors' age is found to be positively related to firm sales. This finding suggests that older board directors are more effective in providing market advice

and network relationships to expand sales. Third, our finding suggests that board directors' age moderates the relationship between the outside directors and firm sales.

This paper has an important limitation due to the relatively small sample size. The findings of this paper need to be corroborated with larger sample and possible cross-validated in multiple high technology industries in China.

References

Baysinger, B. D., Kosnik, R. D. & Turk, T. A. 1991 "Effects of board and ownership structure on corporate R&D strategy". *Academy of Management Journal,* 34**,** 205-214.

Deutsch, Y. 2005 "The impact of board composition on firms' critical decisions: A meta-analytic review". *Journal of Management,* 31**,** 424.

Goodstein, J. & Boeker, W. 1991 "Turbulence at the top: A new perspective on governance structure changes and strategic change". *Academy of Management Journal,* 34**,** 306-30.

Hambrick, D. C. & Mason, P. A. 1984 "Upper echelons: The organization as a reflection of its top managers". *Academy of Management Review,* 9**,** 193-206.

Peng, M. W. 2004 "Outside directors and firm performance during institutional transitions". *Strategic Management Journal,* 25**,** 453-471.

Stearns, L. B. & Mizruchi, M. S. 1993 "Board composition and corporate financing: The impact of financial institution representation on borrowing". *Academic Management Journal,* 36**,** 603-618.

Zahra, S. A. & Pearce, J. A. 1989 "Boards of directors and corporate financial performance: A review and integrative model". *Journal of Management,* 15**,** 291.