

Minghui Teng, Changqing Li

# Product Market Competition, Board Structure, and Disclosure Quality

© Higher Education Press and Springer-Verlag 2011

**Abstract** This paper empirically investigates the mechanism through which product market competition (PMC) affects disclosure quality of listed companies. Based on a sample of listed companies with disclosure quality report from Shenzhen Stock Exchange during 2003–2008, PMC is found to display a U-shaped relationship with disclosure quality, which demonstrates the strategic effect of PMC on disclosure quality. PMC is also found to enhance the board of directors' role in disclosure quality, which demonstrates the governance effect of PMC on disclosure quality. These results enhance the understanding of the role of PMC on disclosure.

**Keywords** product market competition, board structure, disclosure quality, strategic effect, governance effect

---

## 1 Introduction

Information disclosure is critical for the communication between listed companies and their investors. Investors usually confront with “information problems” prior to their investment and the “agency problem” posterior to investment (Healy and Palepu, 2001). Information and agency problems resulting from information asymmetry seriously impede the efficiency of resource allocation in the capital market. In order to resolve these problems, it is crucial to improve disclosure quality. Previous studies on disclosure quality mainly focus

---

*Received June 10, 2009*

Minghui Teng (✉)  
School of Management, Xiamen University, Xiamen 361005, China  
E-mail: mhteng2008@yahoo.com.cn

Changqing Li  
School of Management, Xiamen University, Xiamen 361005, China  
E-mail: lichangqing68@126.com

on internal governance mechanisms including board structure and ownership concentration (Beasley, 1996; Fan and Wong, 2002; Xie, Davidson and DaDalt, 2003), while paying little attention to product market competition that is also an important kind of governance mechanism (Ali, Klasa, and Yeung, 2009). On the one hand, product market competition impels companies in the same industry to seek for their competitors' information and meanwhile to conceal their own information in order to build up information advantage. On the other hand, product market competition increases the possibility of bankruptcy or M&R, which directly threatens investors' assets security and managers' professional security. Further, this impels the owners to perfect corporate governance and the managers to become more diligent.

Not only does product market competition make a firm greatly depend on external competition advantage, but also encourages owners to strengthen their internal governance mechanism and bound the manager's slack behavior. For example, Lin, Cai and Li (1997) analyze the reform experience of state-owned enterprises in China and find that it is difficult to prevent managers' behavior of expropriation without a competitive market to fully reflect the business performance. Tittenbrun (1996) finds that firms' efficiency is mainly related to the degree of market competition, which fundamentally guarantees improvement to the corporate governance mechanism. Allen and Gale (2000) argue that product market competition is more effective than corporate control market or institution monitoring. Yi, Jiang and Qin (2010) analyze the efficiency of corporate governance in different product market competition, and conclude that efficient arrangement of corporate governance promotes disclosure quality, and that product market competition strengthens the role of corporate governance.

As an external governance mechanism, will product market competition impact disclosure quality? Will product market competition strengthen or weaken the relationship between the board of directors and disclosure quality? Prior literature rarely provides an in-depth analysis on how product market competition affects disclosure quality. Based on an industry competition perspective, this paper focuses on product market competition and analyzes how it affects disclosure quality and the relationship between the board and disclosure quality. This paper contributes to the current literature on information disclosure in the following aspects. First, it provides proxies for product market competition by using multi-dimensional measures rather than uni-dimensional measure, which improves the measurement accuracy of product market competition. Second, it examines the relationship between product market competition and disclosure quality, and finds that product market competition displays an U-shaped relationship with disclosure quality rather than a simple linear relationship. Lastly, it examines whether product market competition affects the relationship between the board and disclosure quality.

The remainder of this paper proceeds as follows: Section 2 reviews the related literature. Section 3 provides the theoretical background leading to the research hypotheses. Section 4 describes the research design including the sampling procedure and variable definitions. The empirical results are presented and discussed in Section 5. Section 6 describes robustness checks, and Section 7 concludes the paper.

---

## 2 Literature Review

The informational economics theory holds that information asymmetry between listed companies and their investors tend to result in adverse selection behavior during value assessment and stock exchange process. Investors would seek for information risk premium during value assessment, which would increase the capital cost. Therefore, blue chip companies would strengthen disclosure quality to decrease capital cost. However, disclosure is also associated with cost, which induces listed companies' trade-off decision between the cost and benefit of disclosure.

Prior research on disclosure quality is extensive and diverse, which includes research on how disclosure quality is affected by board size, board independence and CEO/Chair duality. Higher proportion of independent directors can better monitor the board's behavior, which improves disclosure quality. Klein (2002) finds that higher proportion of independent directors leads to more effective supervision. Cui (2004) indicates that higher proportion of independent directors leads to better disclosure quality, which improves the companies' transparency. Cui (2004) also indicates that CEO/Chair duality depresses disclosure quality, which decreases the companies' transparency. Forker (1992) argues that there exists threat to monitoring quality when the roles of chief executive and chairman are combined. Based on logit regression analysis of 75 fraud and 75 no-fraud firms, Beasley (1996) empirically tests the prediction that the larger proportion of outside directors significantly decreases the likelihood of financial statement fraud (FSF), and indicates that the likelihood of financial statement fraud increases when board size increases.

Moreover, when outside director ownership and outside director tenure increase, the likelihood of financial statement fraud is reduced. Liu and Du (2003) conduct an empirical analysis on the relationship between corporate governance and financial statement fraud from different aspects of ownership structure and the board's characteristics. Based on a sample of listed companies punished by CSRC for financial statement fraud in 1994–2002, Liu and Du (2003) find that the percentage of executive directors is positively related to the likelihood of FSF, while board size does not significantly affect the likelihood of FSF. They therefore suggest that it is important to improve corporate governance in order to

overcome accounting information distortion. Based on a disclosure quality evaluation report of Shenzhen Stock Exchange and panel data of 1884 listed companies (2001–2004), Wang and Liang (2008) find that disclosure quality is positively related to the percentage of independent directors and negatively related to the CEO/Chair duality. Our literature review also shows, however, relatively few papers have taken into consideration the impact of market competition on disclosures quality.

This assumes that, as an important external governance mechanism, product market competition has both strategic and governance effects on the information disclosure of listed companies. The strategic effect means that product market competition could significantly affect listed companies' disclosure through influencing the costs and benefits of disclosures. The governance effect means that product market competition could affect the relationship between board structure and disclosure quality. When it comes to the strategic effect, Campbell (1979), Brander and Eaton (1984) suggest that, in concentrated industries, firms' attempts to increase demand for their products vis-a-vis those produced by rivals, such as product innovation or new marketing strategies, often result in the behavior of concealing their operation information to quickly match these attempts. These studies argue that in more concentrated industries, firms would prefer less informative disclosure. Wang and Liu (2008) argue that a moderate degree of competition helps improve disclosure quality, and stronger industry competition induces higher disclosure quality. They also argue that in industries characterized with fierce competition, disadvantageous companies have more incentive to improve disclosure quality; in contrast, low competition in an industry would not improve disclosure quality. Although prior literature has recognized that product market competition affects disclosure quality, it fails to reveal the inherent mechanism that underlies such a relationship.

When it comes to the governance effect, the performance comparison among firms amidst more intense market competition eliminates the uncertainty of market volatility, which could reduce information asymmetry between management and investors, and strengthen the incentive and supervision mechanisms. Karuna (2007) argues that competition encompasses several dimensions including product substitutability, market size, and entry cost, and shows that industry characteristics play a major role in influencing incentives. Moreover, product market competition increases the risk of the company's bankruptcy, which induces managers to maintain cautious attitude on disclosure practice. Based on a sample of 98 Swedish listed companies in 1996–1998, Randøy and Jensen (2004) find that product market competition and board independence have substitution effect on company performance. These studies show that there exists potential relationship between product market competition and board independence. However, the existing studies have not systematically

analyzed the mechanism by which product market competition and board structure affect disclosure quality.

Based on the above rationale, this paper argues that product market competition has both strategic and governance effect on disclosure. The strategic effect means that oligopolistic corporations with balanced competitive advantages may reduce the frequency of disclosures, delay the time of disclosures, and debase the quality of disclosures in order to build up an information advantage. At the same time, product market competition has governance effect, which means that it could affect the relationship between board structure and disclosure quality, and improve the corporate governance mechanism by effectively alleviating the internal governance problem. Therefore, this paper introduces product market competition into disclosure research to examine the mechanism of how product market competition affects disclosure quality and the relationship between board structure and disclosure quality.

---

### **3 Theoretical Background and Hypothesis Development**

#### 3.1 Strategic Effect

Product market competition has a strategic effect on disclosure quality. It reflects particular kinds of game behaviors among firms in the same industry. Meanwhile, disclosure practices have cost and benefit effects, which impel firms to consider the two effects when adopting forthcoming disclosure practice. On the one hand, firms would strengthen disclosure practice to enhance corporate transparency and improve their reputation among investors and the public. Wang and Jiang (2004), Zeng and Lu (2006) argue that better disclosure in listed companies would decrease the equity cost of capital after controlling the companies' size and financial risk. On the other hand, if private information disclosed by firms is exploited by their existing or potential rivals, such a disclosure would place these firms in a disadvantageous position. Firms always seek to maximize acquisition of external information, while minimize the release of internal information to build up the information advantage. A higher disclosure cost would lead to a lower disclosure level (Verrecchia, 1983). Therefore, information disclosure is regarded as a trade-off between the two effects. The mechanism of how product market competition influences disclosure quality is analyzed as follows.

First, in market with highly intense product competition, the market behavior of an individual firm can hardly influence the whole market behavior, and its disclosure hardly induces competitors' counterattack. In this case, firms tend to adopt active disclosure policies in order to attract more attention from potential investors and public, which would improve the social reputation and decrease the cost of capital. Thus, in a highly competitive market environment, firms prefer an

active disclosure policy.

Second, in market with a lower degree of competition, there exist significant differences in competitive advantage among firms. Firms with high competition advantages would adopt active disclosure policy because they do not worry about the market counterattack, and high disclosure quality would improve their market reputation and decrease their cost of capital. Similarly, firms in low competition also do not hesitate to adopt active disclosure policy because their disclosure behavior would not be captured by the advantageous companies. Thus it can be argued that in highly monopolistic market environment, firms prefer active disclosure policy.

Third, in a market with equilibrium advantages of oligopolistic firms, disclosure policy is particularly important because disclosure cost is very likely to exceed disclosure benefit. Although oligopolistic firms could seek greater profits by information sharing and strategic collusion, they would deliberately reduce informative disclosure in order to prevent rivals from acquiring strategically useful information due to the lack of stability of strategic alliance. Clarke (1983) and Gal-Or (1985) point out that such competition behavior would induce oligopolistic firms to reduce disclosure in order to avoid their rivals' counterattack. Brander and Eaton (1984) argue that in market with high degree of concentration, companies' attempt to increase market share would trigger counterattack from their rivals, which induces them to adopt inactive disclosure practices to counteract their rivals. Based on Standard & Poor's accounting database, Harris (1998) finds that firms' disclosure level and earnings forecast are negatively correlated with industry concentration. After controlling for firm size, historical earnings volatility, absolute number of changes in earnings per share and other factors, Ali, Klasa, and Yeung (2009) find that market concentration would negatively affect the frequency of disclosure and the time of disclosure of the company's earnings forecast, and that the industry HHI (Herfindahl-Hirschman) index is negatively correlated with the analyst's ratings of disclosure. Therefore, this leads to the following hypothesis:

**H1** There is a U-shaped relationship between disclosure quality and product market competition. That is, when product market competition is very high or very low, firms tend to adopt active disclosure policies; when product market competition is in middle level, firms tend to adopt inactive disclosure policies.

### 3.2 Governance Effect

Next, this paper examines the relationship between board structure and disclosure quality. The board of directors of a corporation performs critical functions of monitoring and advising top management (Coles, Daniel, and Naveen, 2008). The board has the authority to monitor and evaluate the

managers' behavior including disclosure practices. Chinese corporate law stipulates the board to take responsibilities on firms' disclosure practices, including appointing or firing the manager and treasurer, advising shareholders meeting to replace accounting firms, and assessing disclosure policy. Therefore, disclosure policy conducted by the board has been the focus of supervision authority, shareholders, and creditors, and so on.

This paper then examines how product market competition would affect the relationship between board structure and disclosure quality. Product market competition would help to alleviate the agency problem. In terms of the management incentive, high competition would reduce the information asymmetry in market, which would enhance the relationship between managers' reward and their endeavor (Nalebuff and Stiglitz, 1983). Thus investors could better identify managers' capability and supervise their behavior by resorting to market signals. However, prior literature in this area is inadequate. Therefore, after analyzing the strategic effect of the product market competition on disclosure quality, it is necessary to study its governance effect on disclosure quality, that is, how does it affect the relationship between the board and disclosure quality.

### 3.2.1 Product Market Competition and the Relationship between Board Size and Disclosure Quality

Board size is not only an important indicator of board efficiency, but also an important factor affecting disclosure quality. On the one hand, expansion of board size has a positive effect on disclosure quality. A larger board size means that board members own more professional knowledge, which would strengthen the board's professional behavior and improve disclosure quality. On the other hand, expansion of board size has negative effect on disclosure quality. Yermack (1996) argues that a small board size would help improve board efficiency, and large a size would be easily controlled by the CEO. Xie et al. (2003) also confirms that board size is negatively correlated with disclosure quality.

Further, it is necessary to analyze how product market competition affects the relationship between board size and disclosure quality. Yermack (1996) suggests that diversified firms likely have a large board in order to require more professional industrial experience, which indicates that industry characteristics will affect the priority of board size. Klein (1998) suggests that advisory needs of the CEO increase with the extent of the firm's dependence on the environment for resources. Cole, Daniel, and Naveen (2008) argue that complex firms have greater advisory needs and acquire a larger board with more outside directors. In terms of companies in low competition market, most of them with huge size are strictly supervised by government, which would constrain CEO's manipulation

behavior. Meanwhile, these companies need to attain economies of scale and scope in the process of production and operation, which would lead to relative complexity of internal management and control mechanism. A large board size would improve professional expertise and experience, which means that its positive effect on disclosure quality dominates. In terms of companies in high competition market, intense competition impels them to greatly resort to advice from the board to avoid decision that may cause volatility in firm performance, which would amplify the positive effect of expanding board size on disclosure quality. Meanwhile, intense competition makes it necessary for companies to respond to market changes. Increase in board size would reduce the efficiency of board decision and increase the likelihood of the board being controlled by the CEO, which would amplify the negative effect of large board size on disclosure quality. Since the direction of the effect of product market competition on the relationship between board size and disclosure quality remains unclear, we test the following non-directional hypothesis (stated in the null form):

**H2.1** Product market competition is unrelated to the relationship between board size and disclosure quality.

### 3.2.2 Product Market Competition and the Relationship between Board Independence and Disclosure Quality

Independent directors are outside directors who have no other affiliation with the firm, and have no actual and potential conflict of interests with the firms they serve. They have incentives to develop reputation as experts in decision control standing by the interests of shareholders objectively and impartially, which means effectively monitoring the behaviors of executive directors and managers. In particular, Fama and Jensen (1983) indicate that higher proportion of independent non-executive directors would induce more voluntary disclosure. As the proportion of outside director increases, the likelihood of financial fraud would decrease, thereby enhancing disclosure quality. As outside directors extend their tenure and reduce the number of companies they serve, the likelihood of financial fraud tends to decrease (Beasley, 1996). Base on samples of Hong Kong listed companies, Chen and Jaggi (2000) finds that a high proportion of independent directors leads to higher disclosure quality. In this paper, we argue that board independence is positively related to disclosure quality.

Then it is necessary to further analyze whether product market competition would affect the relationship between board independence and disclosure quality. In high competition market, companies with poor management increase the likelihood of being merged or liquidated, which would lead to utility loss of the



managers and reputation loss of independent directors. In order to maintain their reputation in the human capital market, independent directors are motivated to diligently monitor managers' behavior on manipulating disclosures, which would in turn improve disclosure quality. Reputation effects of independent directors are even more prominent in highly competitive industries. Moreover, outside directors provide a quality of advice to the CEO otherwise unavailable from corporate staff (Dalton, Daily, Johnson, and Ellstrand, 1999). In high competition market, the intense market competition makes firms greatly resort to advice from independent director, which makes independent directors play more important strategic role in firm development, and obtain more important information about the firms, and thus improve disclosure quality. However, in low competition market, companies with poor management are less likely to be merged or liquidated. So independent directors are faced with less risk of reputation loss, for their human capital seldom depends on their performance as internal decision managers in that firm. This would result in little influence on the improvement of disclosure quality. Therefore, this leads to the following hypothesis:

**H2.2** Product market competition would affect the positive relationship between board independence and disclosure quality: the positive relationship is more significant for companies in high competition markets than that in low competition markets.

### 3.2.3 Product Market Competition and the Relationship between CEO/Chair Duality and Disclosure Quality

The CEO/Chair duality is often considered as an important factor influencing the governance efficiency. The China Securities Regulatory Commission (CSRC) also considers the separation of chairman and CEO as an important mechanism for improving governance. Based on a sample of Hong Kong listed companies, Gul and Leung (2004) argues that CEO/Chair duality impairs board independence and further reduces internal governance quality, which means that the CEO/Chair duality would be negatively related to disclosure quality. Wang and Liang (2008) also argue that CEO/Chair duality would deteriorate disclosure quality. So it is important to analyze the relationship between CEO/Chair duality and disclosure quality. In this paper, we argue that CEO/Chair duality is negatively related to disclosure quality.

It is necessary to further analyze whether product market competition affects the relationship between CEO/Chair duality and disclosure quality. As an important outside governance mechanism, product market competition can complement the board's governance function. High product market competition

would impel CEOs, who are also chairman of the board, to endeavor for the interest of firms and rigorously constraint their behavior of manipulation. This would alleviate to some extent the agency problem caused by CEO/Chair duality and further weaken the negative relation between CEO/Chair duality and disclosure quality. But in low competition market, CEO/Chair duality would increase the likelihood of manipulating accounting information to expropriate the interest of firms due to the weak external governance. This leads to the following hypothesis:

**H2.3** The product market competition would affect the negative relationship between CEO/Chair duality and disclosure quality: the negative relationship is more significant for companies in low competition market than that in high competition market.

---

## 4 Research Design

### 4.1 Sample and Data Sources

This research is based on the samples of listed companies with disclosure ratings reported by the Shenzhen Stock Exchange. Shenzhen Stock Exchange announced the disclosure ratings of all companies listed on the Shenzhen Stock Exchange in 2001. The CSRC issued “*the Guidance on the Establishment of Independent Directors in Listed Companies*” in August 16, 2001 and required that the listed companies to have at least one third of the total directors as independent directors in the board by June 30, 2003. To avoid the influence of the policy, the sample period was from 2003 to 2008. Considering the particularity of industries and the adequacy of samples, we excluded the following sub-samples: (1) finance, banks and insurance companies; (2) comprehensive industry and other manufacturing companies; (3) timber, furniture, communication and culture industries; (4) B-share companies; and (5) firms with the loss of data and abnormal data. After the elimination, 3159 firm-year observations were obtained. The corporate disclosure ratings were obtained by manual collecting from the column of “Disclosure Evaluation of Credit Files” in the official website of Shenzhen Stock Exchange. The rest of data came from CSMAR Database and Wind Financial Database. All data were cross-checked with the data of annual reports of sample companies. The data from annual reports were retained in case of inconsistency existed between the two types of data. We used Excel 2007 and Stata 10.0 software in data processing. Notably, this paper included competition variables calculated based on the data of all listed companies in China.

## 4.2 Variable Definition

### 4.2.1 Information Disclosure Quality (ID\_Quality)

Prior research has no consensus with regard to the measure of disclosure quality. Previous studies mainly adopted two methods. One is authority rankings method such as the “disclosure rankings” of Standard & Poor’s (S&P) and “credit file” of Shenzhen Stock Exchange. The other is the score index of disclosure quality constructed by the researchers. Considering the authoritativeness of scholar ratings and limit of the research samples, authority rankings are more popular in the research field. Therefore, this paper adopts the disclosure quality score provided by Shenzhen Stock Exchange. Because the disclosure ratings are ordinal data, this paper chooses ordered logit model. Disclosure quality equals 3, 2, 1 and 0, when its rating is excellent, good, eligible, and unqualified, respectively.

### 4.2.2 Explanatory Variables

Explanatory variables include board structure (*BD*) and product market competition (*PMC*). Board structure is measured by board size, board independence and the CEO/Chair duality. Board size (*size*) is measured as the number of directors. Board independence (*indep*) is measured as the proportion of independent directors to all directors. CEO/Chair duality (*dual*) is dummy variable, which equals 1 when the CEO is also the COB, and equals 0 otherwise.

There is no agreement currently with the proxy for product market competition. There are mainly three measurements, including industry concentration index, industry average rent, and industry average profit margin. First, industry concentration is often measured by Herfindahl-Hirschman Index (HHI).<sup>1</sup> However, given the level of industry concentration, competition is influenced by several factors including product substitutability, market size and entry cost, and so on (Raith, 2003). High industry concentration may reflect high or low competition (Karuna, 2007). Therefore, HHI as a measurement for industry concentration is not a perfect proxy for product market competition. Second, industry average rent is often measured as profits before interest payments, tax, and depreciation minus the costs of capital multiplied by total assets and standardized by company

---

<sup>1</sup>  $HHI = \sum \left( \frac{y_i}{\sum y_i} \right)^2$ , where  $y_i$  is the prime operating revenue attributable to firm  $i$  in that industry.

sales. Higher industry average rent may indicate lower product market competition, and vice versa. By comparison, industry average rent is relatively less used to measure competition because it can not accurately calculate the cost of capital. The third one is industry average profit margin. Nickell (1996) suggests that the prime business profit margin can be viewed as monopoly rents. High monopoly rent leads to high cost of entry, which makes the competition become less intense. Prime business profitability reflects not only the level of competition, but also the long-term operating performance. It is more related to corporate governance compared with the market structure index (Randøy and Jensseny, 2004). Therefore, this paper considers the multi-dimensional measurement for competition to outperform single dimension index, and industry average profit margin as a proxy for product market competition is used in the robustness test.

According to the industrial economics theory, the factors affecting the product market competition mainly include industry concentration and product differentiation, market size and entry costs, and so on. Raith (2003) and Karuna (2007) suggest that market structure is endogenous and influenced by product differentiation, market size, and entry costs. When markets vary in size or entry costs, less concentration may reflect higher levels of competition. Meanwhile, industry concentration would affect disclosure quality (Ali, Klasa and Yeung, 2009; Wang and Liu, 2008). In order to control the impact of industry concentration, this paper uses HHI as a control variable. In case of product differentiation, we follow the research of Karuna (2007) and define it equal to the sum of all firms' sale divided by all firms' operating costs in the industry. Lower levels of product differentiation mean higher levels of production market competition. Similarly, industry attractiveness is introduced into this paper, and is defined as the natural log of market size divided by entry of cost.<sup>2</sup> When the market size is large or the cost of entry is low, product market competition becomes intense.

#### 4.2.3 Control Variables

Several control variables documented in prior research are included in subsequent regression analysis. Prior research shows that firm characteristics affect its disclosure level, which mainly includes firm size, financial leverage, and profitability. In term of profitability, firms with high disclosure quality

---

<sup>2</sup> Market size is measured by industry sales. Cost of Entry is equal to weighted average of gross value of cost of property, plant, and equipment.

ratings from financial analysts generally have higher level of current profit (Lang and Lundholm, 1993). Financial leverage is used to control financial risk of firms. Higher asset-liability ratio means more earnings management behavior taken by executives, which would reduce disclosure quality. Haw, Qi and Wu (2003) argue that listed companies with greater financial risks tend to delay disclosure of annual reports. When it comes to firm size, there is a positive correlation between firm size and disclosure quality. Big company may disclose more information, which would decrease the level of information asymmetry between investors and company (Diamond and Verrecchia, 1991).

Moreover, Fan and Wong (2002) suggests that there is a negative relationship between ownership concentration and disclosure quality based on the research of listed companies in East Asia countries. However, some researchers found evidence showing a positive relationship between disclosure quality and ownership of largest shareholder (e.g., Lü, 2006). Large shareholders with high ownership concentration have incentives to collect information and effectively supervise the firm's operation including the process of generating financial report, which would avoid "free-rider" problems resulting from high ownership decentralization. Therefore, ownership concentration can improve the quality of financial report (Shleifer and Vishny, 1997). The name and definition of control variables and their predicted directions are shown in Table 1.

**Table 1** Definition of Control Variables and Predicted Symbol

Control Variables	Abbreviation	Definition	Predicted direction
Profitability	<i>roa</i>	Net income/average total income	+
Capital structure	<i>lev</i>	Debt-to-asset ratio	-
Size	<i>mve</i>	Natural log of market value of equity	+
Ownership concentration	<i>fir_sh</i>	Ownership of the largest shareholder	?
Special treatment	<i>st</i>	1 if company is specially treated; 0 otherwise	-

## 5 Empirical Results

### 5.1 Descriptive Statistics

Table 2 presents descriptive statistics of product market competition and disclosure ratings for 3 159 firm-year observations. As shown, three determinants of competition including product differentiation, industry attractiveness, and HHI

**Table 2** Product Market Competition in Different Industries and Disclosure Ratings

Industries	Differentiation	Attractiveness	HHI	Fail (0)	Pass (1)	Good (2)	Excellent (3)	Percentage
Agriculture, forestry, animal husbandry and fishery	1.054	2.934	0.075	7.58%	42.42%	39.39%	10.61%	2.09%
Mining	1.198	1.142	0.393	4.26%	23.40%	44.68%	27.66%	1.49%
Food and beverage	1.087	3.406	0.057	1.47%	35.29%	55.15%	8.09%	4.31%
Textile, garments and furs	1.035	3.821	0.033	6.06%	33.33%	53.94%	6.67%	5.22%
Papermaking and printing	1.081	2.196	0.101	5.08%	32.20%	62.71%	0.00%	1.87%
Petroleum and chemical rubber, plastic	1.056	3.464	0.041	4.95%	30.42%	58.49%	6.13%	13.42%
Electronic	1.002	3.616	0.135	3.21%	26.92%	62.18%	7.69%	4.94%
Metal and nonmetal	1.088	3.265	0.040	3.40%	26.23%	57.41%	12.96%	10.26%
Machinery, equipment and instruments	1.047	5.066	0.024	5.05%	29.91%	54.05%	10.99%	17.57%
Medicines and medical devices	1.054	4.504	0.034	1.83%	34.40%	56.42%	7.34%	6.90%
Production and supply of electric power, gas and water	1.169	1.588	0.079	2.92%	18.25%	68.61%	10.22%	4.34%
Construction	1.016	3.217	0.284	5.17%	48.28%	36.21%	10.34%	1.84%
Transport, warehousing and storage	1.164	1.969	0.103	2.86%	20.95%	58.10%	18.10%	3.32%
Information technology	1.053	0.979	0.177	6.13%	31.60%	55.66%	6.60%	6.71%
Wholesale and retail trades	1.019	5.483	0.064	1.19%	26.79%	61.90%	10.12%	5.32%
Real estate	1.162	5.117	0.057	6.22%	26.42%	55.44%	11.92%	6.11%
Social Services	1.116	2.575	0.052	1.47%	30.15%	56.62%	11.76%	4.31%
Proportion				4.12%	29.66%	56.47%	9.75%	100.00%
Kruskal-Wallis Test	2 161.47***	2 962.60***	2 885.10***					

Note: \*\*\*, \*\* and \* represent significant at 1%, 5%, 10%, respectively.

in the industry basically capture the different dimensions of competition. The product market competition would be high if the product differentiation and HHI are lower and industry attractiveness is high. For example, the industries of mechanical equipment and meters, textiles, clothing, fur, wholesale and retail trade industry are of relatively intense competition, which means that the product differentiation and HHI are relatively low while industry attractiveness is relatively high in these industries. In contrast, the industries of transport, warehousing and mining are of relatively low competition, which means that the product differentiation and HHI are relatively high while industry attractiveness is relatively low. These industries are oligopolistic and have low pressure in research and development, product upgrading, consumer preferences and marketing, which makes the price of their products or services relatively stable and average yield higher and more stable.

Table 2 also shows that, firms with low disclosure ratings in higher and lower product market competition industry constitute a smaller proportion compared with firms in intermediate level of product market competition. Meanwhile, firms with high disclosure ratings constitute a larger proportion in lower product market competition industry than in industry with different product market competition. These show that disclosure ratings vary with industries due to different levels of product market competition. Kruskal-Wallis test shows that there are significant differences in product market competition in different industries. Moreover, it is necessary to reconsider how to properly use the HHI as a proxy for product market competition. As shown in Table 2, HHI in electricity, gas, and water production and supply industries are relatively high. As these industries are characteristic of less competition, this finding indicates that only considering HHI as the measure of competition is inappropriate; multi-dimensional nature of competition should be considered.

In order to further analyze the difference of disclosure quality in different industries, this paper separated the research sample into high competition and low competition subsamples according to the multi-dimension of competition, and adopted *t*-test and Wilcoxon rank test on the two subsamples. The sample was divided in accordance with the following rules. First, the medians of the three determinants of competition, namely product differentiation, industry attractiveness, and HHI, were calculated; then sample was divided into high competition subsample and low competition subsample according to these medians. For example, when a certain industry has two medians belonging to high competition category, it is then classified into high competition subsample. Similarly, if an industry has two medians belonging to low competition category, it is classified into low competitive subsample. *T* test and Wilcoxon rank test results showed that the separation of the full sample into high competition and low competition subsamples is statistically significant (see Table 3).

**Table 3** Descriptive Statistics of Variables and Difference Test of High Competition and Low Competition Subsamples

Variables	Full			High			Low			T test	Wilcoxon rank test
	Mean	Median	Max.	Min.	Mean	Median	Mean	Median			
<i>ID_Quality</i>	1.719	2.000	3.000	0.000	1.701	2.000	1.749	2.000	-1.868*	-1.847*	
<i>dual</i>	0.164	0.000	1.000	0.000	0.173	0.000	0.149	0.000	1.794*	1.793*	
<i>size</i>	9.308	9.000	18.000	5.000	9.154	9.000	9.579	9.000	-5.641***	-4.721***	
<i>indep</i>	0.350	0.333	0.600	0.000	0.352	0.333	0.348	0.333	2.114**	2.128**	
<i>diff</i>	1.071	1.056	1.313	0.970	1.056	1.050	1.097	1.084	-20.792***	-20.700***	
<i>ind_att</i>	3.630	3.635	5.624	0.306	4.395	4.495	2.282	2.230	68.006***	43.982***	
<i>HHI</i>	0.069	0.045	0.433	0.020	0.046	0.033	0.110	0.079	-29.837***	-29.546***	
<i>roa</i>	0.027	0.030	0.252	-0.384	0.026	0.029	0.029	0.033	-0.920	-1.683*	
<i>lev</i>	0.536	0.508	2.821	0.064	0.537	0.510	0.536	0.505	0.066	0.997	
<i>mve</i>	21.352	21.200	24.383	19.516	21.264	21.129	21.507	21.387	-6.701***	-6.425***	
<i>fir_sh</i>	0.372	0.343	0.735	0.103	0.362	0.324	0.391	0.374	-4.990***	-5.049***	
<i>st</i>	0.121	0.000	1.000	0.000	0.118	0.000	0.128	0.000	-0.828	-0.828	
<i>Obs.</i>	3159			2015			1144				

Note: \*\*\*, \*\* and \* represent significant at 1%, 5%, 10%, respectively.



5.2 Strategic Effects of Product Market Competition on Disclosure Quality

Considering the ordinal nature of the disclosure ratings in this paper, we only applied the Pearson correlation analysis for numerical variable. The results showed no high correlation among variables. All variables can be entered into the regression function simultaneously. Therefore, this paper constructs the ordered logit model as follows to test H1.

$$\begin{aligned} \text{logit}P_j &= \ln \frac{P(ID\_Quality > j)}{1 - P(ID\_Quality > j)} \\ &= \alpha_j + \beta_1 PMC + \beta_2 PMC^2 + \beta_3 HHI + \beta_4 BD + \beta_5 roa \\ &\quad + \beta_6 lev + \beta_7 mve + \beta_8 fir\_sh + \beta_9 st + \varepsilon, \end{aligned} \tag{1}$$

where *ID\_Quality* represents corporate disclosure ratings. *PMC* represents production market competition and is measured by industry attractiveness (*ind\_att*) or product differentiation (*diff*). *BD* represents board structure and is measured by board size, independence and the *CEO/Chair* duality. The rest variables are the same as the above described.  $\alpha_j$  ( $j = 0, 1, 2$ ) is intercept.  $\beta_i$  ( $i = 1, \dots, 9$ ) is the estimated coefficient of independent variables.  $\varepsilon$  is error term.

The results of ordered logit regression of disclosure ratings and product market competition levels are shown in Table 4. In order to overcome the potential heteroskedastic problem in cross-industry studies, we clustered the observations at the industry level to allow for the firms within an industry to be connected in some way while firms across industries to keep independent. The *z*-score of regression coefficients was calculated by using robust standard error of heteroscedasticity corrected. The results show that *PMC* does affect disclosure quality.

**Table 4** Relationship between Product Market Competition and Disclosure Quality

Independent variables	Model 1	Model 2	Model 3	Model 4	Model 5
<i>diff</i>	0.251 (0.39)	-1.058 (-1.23)			-1.371 (-1.49)
<i>Diff</i> <sup>2</sup>		16.042** (2.35)			15.072** (2.16)
<i>ind_att</i>			-0.009 (-0.26)	0.007 (0.20)	-0.008 (-0.22)
<i>ind_att</i> <sup>2</sup>				0.064*** (3.27)	0.061*** (3.10)

(To be continued)

(Continued)

Independent variables	Model 1	Model 2	Model 3	Model 4	Model 5
<i>HHI</i>	-0.152 (-0.24)	-0.502 (-0.76)	-0.241 (-0.30)	-1.195 (-1.38)	-1.644* (-1.80)
<i>dual</i>	-0.235** (-2.39)	-0.241** (-2.46)	-0.237** (-2.42)	-0.222** (-2.25)	-0.230** (-2.34)
<i>size</i>	0.094*** (5.31)	0.093*** (5.21)	0.094*** (5.30)	0.095*** (5.33)	0.093*** (5.21)
<i>indep</i>	1.297* (1.88)	1.274* (1.84)	1.294* (1.87)	1.330* (1.93)	1.314* (1.90)
<i>roa</i>	4.366*** (7.81)	4.404*** (7.85)	4.370*** (7.82)	4.308*** (7.70)	4.353*** (7.76)
<i>lev</i>	-0.351*** (-2.83)	-0.343*** (-2.75)	-0.351*** (-2.83)	-0.368*** (-3.00)	-0.358*** (-2.91)
<i>mv</i>	0.285*** (5.78)	0.288*** (5.85)	0.287*** (5.91)	0.292*** (6.02)	0.295*** (6.02)
<i>fir_sh</i>	0.989*** (4.01)	1.009*** (4.09)	0.988*** (4.00)	1.042*** (4.20)	1.053*** (4.25)
<i>st</i>	-0.901*** (-6.96)	-0.888*** (-6.85)	-0.901*** (-6.96)	-0.914*** (-7.06)	-0.905*** (-6.97)
cut1_cons	4.236*** (3.68)	4.050*** (3.84)	3.970*** (3.73)	4.180*** (4.01)	4.254*** (4.04)
cut2_cons	7.066*** (6.15)	6.884*** (6.59)	6.800*** (6.44)	7.014*** (6.78)	7.091*** (6.78)
cut3_cons	10.285*** (8.86)	10.107*** (9.55)	10.019*** (9.38)	10.243*** (9.78)	10.323*** (9.75)
<i>N</i>	3159	3159	3159	3159	3159
Log Likelihood	-3 005.41	-3 002.89	-3 005.45	-3 000.26	-2 998.12
Pseudo <i>R</i> <sup>2</sup>	0.086 5	0.087 2	0.086 5	0.088 0	0.088 7
Prob.	0.000	0.000	0.000	0.000	0.000

Note: Numbers in brackets are *T* values. \*\*\*, \*\* and \* represent significant at 1%, 5%, 10%, respectively.

In Table 4, Models 1 and 3 reflect the relationship between the product differentiations, industry attractiveness, and disclosure quality. The estimated coefficients of product differentiation and industry attractiveness are not significant at conventional levels. Models 2 and 4 provide the results of the ordered logit regression conducted according to Equation (1), respectively

including the level and square of product differentiation or the level and square of industry attractiveness and the control variables, which is to investigate whether there exists a U-shaped relationship between disclosure quality and product market competition. As can be seen in Model 2, the coefficient of the level product differentiation is negative and its significant level increases after the square of product differentiation is introduced, and the coefficient of the square of product differentiation is positive and significant (at the 5% level), which means there exists a U-shaped relationship between disclosure quality and product differentiation. Similarly, in Model 4, the coefficient on square of industry attractiveness is also positive and significant (1% level), which means there is a U-shaped relationship between disclosure quality and industry attractiveness. Model 5 presents the results for the main analysis in this study, when the two product market competition variables and control variables are included together. The results indicate that the coefficients for the product market competition variables are comparable with their counterparts in Model 2 and 4. The coefficient on the square of product differentiation is positive and significant (5% level). The coefficient on the square of industry attractiveness is positive and significant (1% level). Therefore, H1 is supported.

### 5.3 Governance Effects of Product Market Competition on Disclosure Quality

The ordered logit model was constructed to investigate the governance effects of product market competition on disclosure quality. We analyzed the relationship between disclosure quality and board structure respectively in high competition, low competition subsample, and full sample, respectively.

$$\begin{aligned} \log \text{it} P_j &= \ln \frac{P(ID\_Quality > j)}{1 - P(ID\_Quality > j)} \\ &= \alpha_j + \beta_1 \text{dual} + \beta_2 \text{size} + \beta_3 \text{size}^2 + \beta_4 \text{indep} + \beta_5 \text{roa} \\ &\quad + \beta_6 \text{lev} + \beta_7 \text{mve} + \beta_8 \text{fir\_sh} + \beta_9 \text{st} + \varepsilon. \end{aligned} \quad (2)$$

Table 5 shows the results of ordered logit regression. The results show that product market competition affects the relationship between disclosure quality and board structure. With respect to H2.1, results for all models indicate a significant relationship between board size and disclosure quality, suggesting that product market competition is a function of disclosure policy. Model 1 depicts the regression results of the full sample. The coefficients on board structure are, to a large degree, as predicted and significant at the conventional level. In term of board size, there exists an inverted U-shaped relationship between disclosure quality and board size, which indicates that there exists an optimal size: When the board size is less than the optimal size, a larger board size means that more

directors with professional expertise and experience would improve disclosure quality. When board size is more than optimal size, a larger board size would make the board more easily manipulated by managers, which would lead to the loss of procedure and then deteriorate disclosure quality. Model 2 of Table 5 provides the results of ordered logit regression of low competitive subsample. The coefficient of board size is positive and significant (1% level), while the coefficient of the square of board size is not significant. This indicates that when external governance is weaker, a large board size can better improve disclosure quality. Model 3 of Table 5 shows the result of order logit regression of high competition subsample. The results show that when product market competition is intense, board size has more significant effect on disclosure quality than that in low competition. Namely, there exists a remarkable inverted U-shaped relationship between disclosure quality and board size.

**Table 5** Relationship among Product Market Competition, Board Structure and Disclosure Quality

Independent variables	Model 1 (full)	Model 2 (low)	Model 3 (high)
<i>dual</i>	-0.231** (-2.36)	-0.280* (-1.77)	-0.195 (-1.56)
<i>size</i>	0.113*** (5.53)	0.119*** (3.56)	0.101*** (3.90)
<i>size</i> <sup>2</sup>	-0.009** (-2.04)	-0.001 (-0.16)	-0.014*** (-2.71)
<i>indep</i>	1.554** (2.20)	1.587 (1.28)	1.584* (1.81)
<i>roa</i>	4.342*** (7.77)	3.455*** (4.29)	4.922*** (6.51)
<i>lev</i>	-0.344*** (-2.77)	-0.229 (-1.27)	-0.467*** (-2.70)
<i>mve</i>	0.290*** (5.97)	0.272*** (3.61)	0.268*** (4.14)
<i>fir_sh</i>	1.002*** (4.07)	2.292*** (5.51)	0.252 (0.82)
<i>st</i>	-0.901*** (-7.00)	-0.929*** (-4.41)	-0.887*** (-5.38)
cut1_cons	3.264*** (3.14)	3.429** (2.13)	2.487* (1.79)

(To be continued)

(Continued)

Independent variables	Model 1 (full)	Model 2 (low)	Model 3 (high)
cut2_cons	6.098*** (5.91)	6.256*** (3.91)	5.332*** (3.86)
cut3_cons	9.317*** (8.93)	9.460*** (5.84)	8.598*** (6.16)
N	3159	1144	2015
Log likelihood	-3 003.82	-1 085.310	-1 906.13
Pseudo R <sup>2</sup>	0.0870	0.1047	0.0812
Prob.	0.000	0.000	0.000

Note: Numbers in brackets are *T* values. \*\*\*, \*\* and \* represent significant at 1%, 5%, 10%, respectively.

In term of independence and CEO/Chair duality, Model 1 shows that coefficient on independence is positive and significant (5%), and coefficient on CEO/Chair duality is negative and significant (5%). Furthermore, Models 2 and Model 3 make regression analysis respectively using high competition and low competitive subsamples. Model 2 provides the results of ordered logit regression of low competitive subsample. The coefficient on CEO/Chair duality is negative and significant (10%), while the coefficient on independence is not significant at conventional level, which indicates that when an external governance is weaker, independent directors play weaker role in the corporate governance. Model 3 shows the results of the order logit regression of high competition subsample. The coefficient of board independence is positive and significant, while the coefficient of CEO/Chair duality is not significant at conventional level. This indicates that product market competition can exert governance function, weaken the agency problem caused by CEO/Chair duality, and relieve its negative effect on disclosure quality. Therefore, both H2.2 and H2.3 are supported.

## 6 Robustness Check

In order to test the robustness of the relationships between the PMC and disclosure quality, this paper selects an alternative proxy for PMC by using industry average price-cost margin documented in prior research, separates the full samples into high competition subsample and low competition subsample according to the mean or median of industry average price-cost margin calculated, and then replicates this examine by using ordered logit regression. The regression results are consistent with the earlier conclusions, as can be seen in Table 6.

**Table 6** Regressions Using Lerner Index as Proxy for Product Market Competition

Independent variables	Model 1	Model 2 (full)	Model 3 (mean low)	Model 4 (mean high)	Model 5 (median low)	Model 6 (median high)
<i>rent</i>	-2.136** (-2.08)					
<i>rent</i> <sup>2</sup>	20.627** (2.41)					
<i>dual</i>	-0.234** (-2.39)	-0.231** (-2.36)	-0.384** (-2.36)	-0.143 (-1.16)	-0.472** (-2.43)	-0.132 (-1.15)
<i>size</i>	0.093*** (5.23)	0.113*** (5.53)	0.120*** (3.33)	0.112*** (4.45)	0.130*** (3.26)	0.108*** (4.48)
<i>size</i> <sup>2</sup>		-0.009** (-2.04)	-0.011 (-1.36)	-0.008 (-1.44)	-0.014 (-1.60)	-0.008 (-1.50)
<i>indep</i>	1.266* (1.84)	1.554** (2.20)	1.385 (1.16)	1.567* (1.76)	0.331 (0.25)	1.904** (2.25)
<i>roa</i>	4.399*** (7.85)	4.342*** (7.77)	4.570*** (3.86)	4.176*** (6.44)	4.468*** (3.32)	4.289*** (6.87)
<i>lev</i>	-0.330*** (-2.65)	-0.344*** (-2.77)	-0.797*** (-3.17)	-0.153 (-1.07)	-0.714** (-2.50)	-0.230* (-1.65)
<i>mve</i>	0.300*** (6.07)	0.290*** (5.97)	0.225** (2.53)	0.317*** (5.41)	0.242** (2.45)	0.299*** (5.28)
<i>fir_sh</i>	0.958*** (3.88)	1.002*** (4.07)	0.628 (1.46)	1.190*** (3.94)	0.443 (0.97)	1.218*** (4.14)
<i>st</i>	-0.904*** (-7.00)	-0.901*** (-7.00)	-0.158 (-0.71)	-1.189*** (-7.66)	-0.314 (-1.30)	-1.097*** (-7.26)
cut1_cons	4.337*** (4.10)	3.264*** (3.14)	1.451 (0.75)	3.986*** (3.20)	1.316 (0.61)	3.734*** (3.10)
cut2_cons	7.168*** (6.83)	6.098*** (5.91)	4.234** (2.23)	6.877*** (5.54)	4.128* (1.95)	6.601*** (5.50)
cut3_cons	10.392*** (9.78)	9.317*** (8.93)	7.449*** (3.90)	10.117*** (8.03)	7.260*** (3.40)	9.873*** (8.12)
<i>N</i>	3 159	3 159	1 051	2 108	836	2 323
Log likelihood	-3 002.48	-3 003.82	-999.18	-1 992.62	-801.89	-2 190.55
Pseudo <i>R</i> <sup>2</sup>	0.087 4	0.087 0	0.067 9	0.099 8	0.074 5	0.093 9
Prob.	0.000	0.000	0.000	0.000	0.000	0.000

Note: Numbers in brackets are *T* values. \*\*\*, \*\* and \* represent significant at 1%, 5%, 10%, respectively.

---

## 7 Limitation and Conclusion

This paper empirically examines the mechanism of how product market competition affects disclosure quality based on the sample of listed company with disclosure quality report from Shenzhen Stock Exchange during 2003–2008. We use diverse proxies for product market competition, but the data used in this paper is limited to listed companies, not including non-listed companies, which may be a limitation in our study. The reasons for this limitation are multifold: First, it is difficult to obtain data from non-listed companies in China for the lack of special databases. Second, it is difficult to integrate the standards of industry classification for listed companies and that for non-listed companies. This limitation maybe settled in future when the capital market becomes more developed.

The results from this research once again demonstrate Adam Smith's famous remark that competitive process can effectively reveal market information; act as natural and useful incentives to improve internal efficiency (Smith, 1972). The finding shows that the product market competition would exert strategic and governmental effects on disclosure quality. Stakeholders of listed companies therefore should diligently investigate the mechanism of how product market competition affects disclosure quality, including both strategic effect and governance effect.

The strategic effect means that production market competition is in a U-shaped relationship with disclosure quality. Specifically, when the intensity of product market competition is in very high or very low levels, disclosure quality would be high. When the intensity of product market competition is in middle level, disclosure quality would be low. It shows that the management authority would consider the product market competition and their competitors' different disclosure policies when making disclosure policy. This implies that potential investors should consider how product market competition affects the disclosure policy of the company they intend to invest and the companies in the same industry. The capital market regulators should also consider the mechanism and adopt differentiated regulation policy in different industries to enhance the effectiveness of disclosure regulation in order to improve disclosure quality of listed companies.

The governance effect means that production market competition would strengthen the board structure's effect on disclosure quality. Specifically, when the intensity of product market competition is low, a larger board size would help improve disclosure quality, but CEO/Chair duality would affect disclosure quality more significantly. When the intensity of product market competition is high, the "inverted U-shaped" relationship between board size and disclosure quality would be more significant, and the board independence would more

significantly affect disclosure quality. These indicate that product market competition would help resolve the agency problem and improve the governance function of the board. Therefore, the government should strengthen the market competition mechanism to exploit the governmental functional of product market competition so as to improve the governance efficiency, improve disclosure quality and promote the capital market development.

**Acknowledgements** This work is supported by three programs of the Ministry of Education in China, namely Key Research Program of Humanities and Social Science (No. NCET-06-0565), Program for New Century Excellent Talents in Universities (No. 07JJD630009), and Humanities and Social Science Research Program (No. 08JC630069). We would like to thank the anonymous referees for their constructive advice.

---

## References

- Ali, A., Klasa, S., & Yeung, E. 2009. *Product market competition and corporate disclosure policy*. SSRN Working Paper.
- Allen, F., & Gale, D. 2000. *Corporate Governance and Competition: Theoretical and empirical perspectives*. Cambridge: Cambridge University Press.
- Beasley, M. S. 1996. An empirical analysis of the relation between the board of director composition and financial statement fraud. *The Accounting Review*, 71(4): 443–465.
- Brander, J., & Eaton, J. 1984. Product line rivalry. *American Economic Review*, 74(3): 323–334.
- Campbell, T. S. 1979. Optimal investment financing decisions and the value of confidentiality. *Journal of Financial and Quantitative Analysis*, 14(5): 913–924.
- Chen, C., & Jaggi, B. 2000. Association between independent non-executive directors, family control and financial disclosures in Hong Kong. *Journal of Accounting and Public Policy*, 19(5): 285–310.
- Clarke, R. N. 1983. Collusion and the incentives for information sharing. *Bell Journal of Economics*, 14(2): 383–394.
- Cole, J. L., Daniel, N. D., & Naveen, L. 2008. Boards: Does one size fit all? *Journal of Financial Economics*, 87(2): 329–356.
- Cui, X. 崔学刚. 2004. 公司治理机制对公司透明度的影响——来自中国上市公司的经验证据 (The effects of corporate governance on corporate transparency—Experience from China listed companies). *会计研究 (Accounting Research)*, (8): 72–80.
- Dalton, D., Daily, C., Johnson, J., Ellstrand, A. 1999. Number of directors and financial performance: A meta-analysis. *Academy of Management Journal*, 42(6): 674–686.
- Diamond, D. C., & Verrecchia, R. E. 1991. Disclosure, liquidity and the cost of capital. *Journal of Finance*, 46(4):1325–1359.
- Forker, J. 1992. Corporate governance and disclosure quality. *Accounting and Business research*, 22(86): 111–124.
- Fama, E. F., & Jensen, M. C. 1983. Agency problems and residual claims. *Journal of Law and Economics*, 26(2): 327–349.
- Fan, J., & Wong, T. J. 2002. Corporate ownership structure and the informativeness of accounting earnings in East Asia. *Journal of Accounting and Economics*, 33(3): 401–425.
- Gal-Or, E. 1985. Information sharing in oligopoly. *Econometrica*, 53(2): 329–343.



- Gul, F. A., & Leung, S. 2004. Board leadership, outside directors, expertise and voluntary corporate disclosures. *Journal of Accounting and Public Policy*, 23(5):351–379.
- Harris, M. H. 1998. The association between competition and managers' business segment reporting decisions. *Journal of Accounting Research*, 36(1): 111–190.
- Haw, I. M., Qi, D. Q., Wu, W. 2003. Audit qualification and timing of earnings announcements: Evidence from China. *A Journal of Practice and Theory*, 22(2): 121–146.
- Healy, P., & Palepu, K. 2001. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting & Economics*, 31(1): 405–440.
- Karuna, C. 2007. Industry product market competition and managerial incentives. *Journal of Accounting and Economics*, 43(4): 275–297.
- Klein, A. 1998. Firm performance and board committee structure. *Journal of Law and Economics*, 41(1): 275–303.
- Klein, A. 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33(3): 375–400.
- Lang, M., & Lundholm, R. 1993. Cross-sectional determinants of analyst rating of corporate disclosures. *Journal of Accounting Research*, 31(2): 246–271.
- Lin, Y. 林毅夫, Cai, F. 蔡昉, & Li, Z. 李周. 1997. 充分信息与国有企业改革 (*Sufficient information and reform of state-owned enterprise*). 上海: 上海人民出版社 (Shanghai: Shanghai People Publishing).
- Liu, L. 刘立国, & Du, Y. 杜莹. 2003. 公司治理与会计信息质量关系的实证研究 (An empirical research on the relationship between corporate governance and the quality of accounting information). *会计研究 (Accounting Research)*, (2): 28–36.
- Lü, H. 吕惠聪. 2006. 大股东控制、审计监督与信息披露质量——来自深圳上市公司的经验证据 (Shareholder controlling, audit supervises and information disclosures—The evidences come from the Shenzhen listed company). *经济管理 (Economic Management Journal)*, (22): 38–45.
- Nalebuff, B. J., & Stiglitz, J. E. 1983. Information, competition, and markets. *American Economic Review*, 73(2): 278–283.
- Nickell, S. 1996. Competition and corporate performance. *Journal of Political Economy*, 104(4): 724–746.
- Raith, M. 2003. Competition, risk and managerial incentives. *American Economic Review*, 93(4): 1425–1436.
- Randøy, T., & Jønsen, J. I. 2004. Board independence and product market competition in Swedish firms. *Corporate Governance: An International Review*, 12(3): 281–289.
- Shleifer, A., & Vishny, R. W. 1997. A survey of corporate governance. *Journal of Finance*, 52(2): 737–783.
- Smith, A. 1972. Guo, D. 郭大力 & Wang, Y. 王亚南 (Trans.). *国民财富的性质和原因的研究 (An inquiry into the nature and causes of the wealth on nations)*. 北京: 商务印书馆 (Beijing: The Commercial Press).
- Tittenbrun, J. 1996. *Private versus public enterprises*. London: Janus Publishing Company.
- Verrecchia, R. E. 1983. Discretionary disclosure. *Journal of Accounting and Economics*, 5(1): 179–194.
- Wang, B. 王斌, & Liang, X. 梁欣欣. 2008. 公司治理、财务状况与信息披露质量——来自深交所的经验证据 (Corporate governance, financial condition and quality of disclosure: evidence from Shenzhen Stock Exchange). *会计研究 (Accounting Research)*, (3): 31–38.
- Wang, W. 汪炜, & Jiang, G. 蒋高峰. 2004. 信息披露、透明度与资本成本 (Information disclosure, transparency and the cost of capital). *经济研究 (Economic Research Journal)*,

(7): 107–114.

- Wang, X. 王雄文, & Liu, Y. 刘焱. 2008. 产品市场竞争与信息披露质量的实证研究(An empirical research on the relationship between product market competition and the quality of information disclosures). *经济科学 (Economic Science)*, (1): 92–103.
- Xie, B., Davidson, W. N., & DaDalt, P. J. 2003. Earnings management and corporate governance: The role of the board and the audit committee. *Journal of Corporate Finance*, 9(3): 295–316.
- Yermack, D. 1996. Higher market valuation for firms with a small board of directors. *Journal of Financial Economics*, 40(2): 185–211.
- Yi, Z. 伊志宏, Jiang, F. 姜付秀, & Qin, Y. 秦义虎. 2010. 产品市场竞争、公司治理与信息披露质量 (Competition in product market, corporate governance and quality of information disclosures). *管理世界 (Management World)*, (1): 133–141.
- Zeng, Y. 曾颖, & Lu, Z. 陆正飞. 2006. 信息披露质量与股权融资成本 (The relationship between disclosure quality and cost of equity capital). *经济研究 (Economic Research Journal)*, (2): 69–79.