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Puppets Fight as Puppet Masters Wish :
The Influence of Shareholder Overlap on Interfirm Rivalry

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Abstract

 If two competing firms receive influence from the same large shareholders, how do they compete? From the viewpoint of competitive dynamics and agency theory, I investigate the impact of overlapping shareholders of two competing firms on their competitive behavior. The overlapping shareholders of two competing firms will attempt to reduce the intensity of their competitive activity because they can increase economic surpluses from the competing firms by intentionally creating the stability of rivalry. Accordingly, competitive actions between two competing firms will become less intensive as their overlapping shareholders acquire more power over the firms. By using data on pairs of leaders and challengers in 13 Japanese industries in which they have engaged in lasting head−to−head competition, I found support for the hypotheses.

Key Words

  interfirm rivalry ; agency theory ; overlapping shareholder ; action frequency ; action magnitude.

Contents

1. Introduction

 Why and how do the overlapping shareholders of two competing firms influence their interfirm rivalry? A firm engages in rivalries with its competing firms to improve or build its market position. However, a firm's decisions on interfirm rivalry might depend on the interests of entities providing that firm with resources, which are called stakeholders. In order to increase their returns, stakeholders wield influence on firm behavior (Frooman, 1999). Among stakeholders, large shareholders are generally recognized as one of the most influential ones because financial resources are vital for corporate operations (Donaldson & Preston, 1995). Shareholders' incentives to influence firms'competitive behavior have been widely investigated in management and economics (e.g., Connelly, Tihanyi, Certo, & Hitt, 2010 ; Fershtman & Judd,

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1987). Nonetheless, the existing literature remains silent about the impact of shareholders having two competing firms' equity (defined as *overlapping shareholders*) on their interfirm rivalry.

In this paper, I investigate the influence of overlapping shareholders on interfirm rivalry from an *awareness−motivation−capability* (AMC) *perspective* and *agency theory*. The AMC perspective prevails in the competitive dynamics literature, arguing that the nature and likelihood of a firm's competitive actions and responses are based on its awareness, motivation, and capability for attacking its rivals (Chen, 1996 ; Chen et al., 2007). Agency theory aims to investigate contracts governing relationships between principals and agents (Fama & Jensen, 1983 ; Jensen, 1986 ; Jensen & Meckling, 1976). By integrating insights from these perspectives, I will present the theoretical reasoning regarding what the overlapping shareholders of two competing firms encourage them to pursue in their interfirm rivalries.

The central thesis of this study is that the overlapping shareholders of two competing firms attempt to pacify their competitive activity. This is because the mild interfirm rivalry of competing firms eventually produces more economic surpluses. Since large shareholders can gain returns from a firm's surplus as income or capital gains, they are incentivized to achieve that condition. From the AMC perspective and agency theory, the overlapping shareholders of two competing firms can manipulate the firms' competitive activity by influencing their awareness, motivation, and capability for competitive activity. If the overlapping shareholders have more power over these competing firms, which is based on their equity ownership levels, the firms' competitive activity will become less intensive. This is because such overlapping shareholders wielding larger influence over competing firms can obtain more opportunities to significantly verify and monitor managerial plans and decisions on the firms' competitive activity through multiple means, such as boards of directors, executive compensations, and direct negotiations (Dalton, Hitt, Certo, & Dalton, 2007 ; Shleifer & Vishny, 1997).

I investigated the hypothesized relationships using data from interfirm rivalries of pairs of a leader and a challenger (i.e., the firm with the second−largest share) in 13 almost−duopolistic industries in Japan from 1997 to 2006. This context is particularly suitable for this study because overlapping shareholders can surely obtain the maximum returns by manipulating competing firms' competitive activity in head−to−head competition ; therefore, overlapping shareholders will be more motivated to manipulate competing firms. As a result, the phenomenon concerned can be more easily observed. The empirical analysis in this study found support for the hypothesized relationships. By using rich and unique data, I empirically expand the theoretical horizons of competitive dynamics and agency theory.

2. Theory and Hypotheses

The AMC Perspective and the Roles of Shareholders in Competitive Dynamics

The AMC perspective theorizes firms' awareness, motivation, and capability for competitive activity as the drivers of interfirm competitive interactions (Chen, 1996). Awareness is based on an organizational communication perspective. The AMC perspective assumes that a firm's decisions on competitive activity are based on information seeking and processing (Smith et al., 1991). The level of awareness reflects the degree to which a firm recognizes the consequences of competitive actions initiated by itself and its rivals (Chen, 1996). When a firm takes note of its rival's competitive actions, it can respond to these actions. Likewise, motivation for competitive activity is based on expectancy−valence theory (Vroom, 1964). When a

firm perceives this subjective reward value and the probability of earning the reward by initiating a certain competitive action, the firm engages in it (Chen & Miller, 1994 ; Yu & Cannella, 2007). Finally, capability for competitive activity conceptually arises from a resource−based view of the firm (Amit & Schoemaker, 1993 ; Barney, 1989, 1991 ; Penrose, 1959). A firm's ability to initiate competitive actions depends on its resources and capabilities (Chen, 1996) ; if the firm's resources and capabilities exceed those of its rival in terms of quality and quantity, it initiates more competitive actions, because the rival cannot initiate effective or quick competitive responses to cancel out these actions (Young, Smith, & Grimm, 2000).

The intensity of competitive activity is partially determined by its frequency and magnitude (Smith et al., 2001 ; Rindova, Becerra, & Contardo, 2004). The frequency of competitive actions is defined as the number of competitive actions initiated by the focal firm within a certain period of time (Smith, Grimm, Gannon, & Chen, 1991). The magnitude of competitive actions represents the resources committed to competitive actions (Rindova et al., 2004). Some studies classify competitive actions into two types based on resource commitment : strategic actions and tactical actions (e.g., Smith et al., 1991 ; Chen, Smith, & Grimm, 1992 ; Miller & Chen, 1994). *Strategic* actions "involve significant commitments of specific, distinctive resources and are difficult to implement and reverse" (Smith et al., 1991 : 63), whereas *tactical* actions "involve fewer and more general resources than strategic actions, are easier to implement, and are often more reversible" (Smith et al., 1991 : 63).

A firm's performance derived from a competitive action largely depends on the likelihood and characteristics of its rival's competitive responses. If the rival initiates an effective and quick competitive response, the effectiveness of the firm's action will disappear (Smith et al., 1991). Smith et al. (1991) empirically demonstrate that airlines' quick responses to competitor's action reduced the competitor's performance in the U.S. domestic airline industry. Likewise, in reaction to competitors' strategic actions, airlines' strategic responses recorded higher performance than did tactical responses. Therefore, if a firm initiates intensive competitive actions and its rival cannot effectively or quickly react to it, the firm can achieve higher performance.

Although firms tend to pursue their own profit maximization, recent studies have started to shed light on the role of shareholders as principals of competing firms in the context of competitive dynamics. As agency theory proposes, the managers of a firm cannot freely decide its competitive activity at managerial discretion ; managers are agents of capital providers (i.e., principals) and agents are supposed to engage in meeting their principals' interests (Fama & Jensen, 1983 ; Jensen & Meckling, 1976 ; Jensen, 1986). Since principals of a firm can control it by verifying and monitoring agents' plans and actions, the principals can influence managerial decisions for their own interests. Based on this logic, competitive activity of competing firms would reflect their capital providers'interests. Recent studies have provided empirical evidence supporting this statement. For example, Connelly et al. (2010) empirically demonstrate that institutional investors influence the frequency of strategic or tactical actions of firms based on their preferences for the temporality of investment. Likewise, Zhang and Gimeno (2010) also show that earning pressures from the capital market on an electric company to increase the capacity utilization level against its competitors.

If large shareholders have more power over firms, they can exercise more influence on the firms' competitive behavior to satisfy their interests (Hansen & Hill, 1991 ; Kochhar & David, 1996 ; Shleifer &

Vishny, 1986). Large shareholders' power over firms and their managers is endorsed by voting and control rights based on levels of equity ownership. Power is defined as "asymmetric control over valued resources in social relations" (Magee & Galinsky, 2008 : 361). Large shareholders with power have multiple means to influence managers in order to navigate their firms to the shareholders' goals. For example, large shareholders can dispatch their representatives to a firm's board of directors in order to verify and monitor managerial decisions and actions (Adams, Hermalin, & Weisback, 2010 ; Demb & Neubauer, 1992 ; Mace, 1971). Likewise, large shareholders can take actions to put pressure on managers by taking political means, such as public announcements, direct negotiations, shareholder proposals, and proxy fights (David, Hitt, & Gimeno, 2001 ; Shleifer & Vishny, 1997). Additionally, large shareholders can align managerial decisions with their interests by setting executive compensation (Devers, Cannella, Reilly, & Yoder, 2007 ; Sanders & Hambrick, 2007). Furthermore, large shareholders can threaten disobedient managers by indicating an option of selling their firm's shares in the capital market (Pfeffer & Salancik, 1978).

Shareholder Overlap between Competing Firms and Its Effect on Competitive Activity

Overlapping shareholders of two firms are defined as those who simultaneously own both firms' shares.[1] As discussed above, large shareholders can wield influence on firms' competitive activity. Since overlapping shareholders of two competing firms, by definition, own the firms' shares, they can simultaneously manipulate the competitive activity of the competing firms such that their competitive activity will jointly meet the overlapping shareholders' interests.

Provided that large shareholders pursue profit maximization from their investments, they will aim to manipulate firms'competitive activity for their own profits. Overlapping shareholders can maximize returns from their investments in competing companies by pacifying the firms' competitive activity. Mild competition between firms increases producers'economic surplus (D'Aveni, 1994 ; D'Aveni, Dagnino, & Smith, 2010 ; Porter, 1980). Because shareholders are legally defined as residual claimants of the firm's profit (Shleifer & Vishny, 1997), the increase in the firms' net income derived from mild competition contributes to shareholders' income. This negative effect of shareholder overlap on competitive intensity has been found at the industry level. Trivieri (2007) empirically demonstrates that Italian banks involved in cross−ownership tended to engage in less competition between 1996 and 2000.

Based on the argument above, overlapping shareholders would intend to pacify the interfirm rivalry between competing firms by influencing their awareness, motivation, and capability for competitive activity in multiple ways. As for the awareness aspect, overlapping shareholders can assist the managers of a firm to analyze its competing firm's competitive actions through their representative directors with knowledge of the competing firm, which is limited to the overlapping shareholders. Likewise, overlapping shareholders force the managers to notice the strategic importance of the competing firm's action by public announcements or shareholder proposals (Shleifer & Vishny, 1986). As a result, the managers of a firm can instantly recognize its competing firm's competitive actions in the way as its overlapping shareholders want. If two competing firms find that the levels of their awareness about rivalry are closely equal, they are less likely to start intensive competitive interactions for fear of possible effective and quick competitive responses (Chen, 1996 ; Smith et al., 1991). Therefore, the firms owned by overlapping shareholders will seriously consider taking less intensive competitive actions and responses, which are desirable for the

overlapping shareholders.

In terms of the motivation aspect, the overlapping shareholders can provide managers with incentives to initiate competitive responses. According to expectancy theory, explicit relationships among effort, performance, and outcome tend to enhance human motivation (Vroom, 1964). Therefore, overlapping shareholders can set the executive compensation such that managers of a firm will be rewarded for taking less intensive competitive actions and responses toward its competing firm. Likewise, overlapping shareholders can demote or dismiss existing managers of the competing firms if their competitive actions are not desirable for overlapping shareholders. Consequently, the managers will have higher motivation to take less intensive competitive actions, which satisfy the overlapping shareholders' expectations.

Finally, overlapping shareholders can encourage managers of a focal firm to take less intensive competitive actions and responses toward its competing firm by equalizing the focal firm's and its competing firm's capability for competitive activity in two ways. First, overlapping shareholders can adjust financial resources provided for competing firms, which are highly versatile in corporate operations (Barney, 1986, 1991). Second, because overlapping shareholders can obtain private information about competitive activity from their representative directors of both competing firms, they can advise the firms about each other's competitive activity. In other words, the overlapping shareholders of two competing firms work as the conduits for their information (Gnyawali & Madhavan, 2001). If two competing firms are equipped with similar resources and knowledge, they are less likely to engage in intensive competitive interactions because effective and quick competitive responses can be initiated (Chen, 1996). Accordingly, the managers of the firm controlled by its overlapping shareholders will conduct less intensive competitive actions for their competing firm's actions.

These overlapping shareholders' influence on awareness, motivation, and capability for competing firms' competitive activity depends on their power over the firms. If the overlapping shareholders have more power over the competing firms, they can use more influential means of encouraging managers to take desirable competitive actions. Thus, when overlapping shareholders have more power over competing firms, their competitive activity tends to become less intensive in terms of action frequency and magnitude.

Hypothesis 1 : As the overlapping shareholders of competing firms have more power over them, the total of the competing firms' action frequency is smaller.
Hypothesis 2 : As the overlapping shareholders of competing firms have more power over them, the average of the competing firms' action magnitude is smaller.

3. Research Methods

Sample and Data Collection

I tested for the proposed relationships by using the sample of the competitive interactions of pairs of leaders (i.e., the firms with the largest market share) and challengers (i.e., the firms with the second largest market share) in 13 almost-duopolistic industries in Japan from 1997 through 2006. I focused on the competitive interactions between the leaders and challengers because they engage in head-to-head competition ; therefore, their competitive behavior has a direct impact on firm performance, such as market share

(Ferrier et al., 1999). In addition, if multiple firms compete in an industry, it is difficult to find the link between overlapping shareholders' effects and other firms' competitive activity because other competing firms' competitive actions might work as confounding factors. Accordingly, in industries in which leaders and challengers stably maintain their positions, the impact of overlapping shareholders on competing firms'competitive activity could be more easily identified than in crowded industries.

This Japanese context is particularly suitable to test for the suggested hypotheses because the competitive activities of competing firms can be easily observed. Japanese firms intensively competed with each other in the 1990 s and 2000 s. After the burst of the bubble economy in the 1990 s, Japanese firms became pessimistic about future market growth. Because of the stagnant market growth in the late 1990 s, Japanese firms engaged in fierce competition with each other to gain and protect market share.

I collected data on competitive actions, following the procedures of Ferrier et al. (1999). First, I selected Japanese listed firms that are considered distinct single−or dominant−business entities in a focal industry (i.e., 70 percent or more of the sales of the firm come from the industry [Rumelt, 1982]). Industries are classified based on the four−digit Japanese Standard Industrial Classification code, which is the equivalent to the North American Industry Classification. By adopting this criterion, I ensured that firms in the same industry were competing directly with each other. If firms did not report details of sales and if the reported information on sales did not fit the four−digit classification, I excluded the firms from the sample.

Second, from the list of single− and dominant−business firms, I chose the pairs of leaders and challengers within industries. A leader is the firm with the largest market share in the focal industry and a challenger is the firm with the second−largest market share in the focal industry. Third, when the leaders and challengers were dominant− or single−business firms in an industry for at least four consecutive years from 1997 to 2006, the industry was included in the sample of this study. The number of the sampled industries is 13.

The unit of analysis of this study is *industry−year*. Since some independent variables were lagged by one year to avoid simultaneous bias, the number of observations is 64 industry−year observations. Table 1 shows the names of firms and industries during the period. I collected firm data from the *Nikkei Economic Electronic Databank System*.

Variables and Measures

Dependent variables. The dependent variables in this study are the *total number of competing firms' action frequency* and the *average of their action magnitude*. Following the procedures adopted in a series of previous studies by Chen and by Ferrier, I collected competitive actions from articles in business newspapers and trade magazines through content analysis. According to Ferrier et al. (1999), competitive actions are "all externally directed, specific, and observable newly created moves initiated by a firm to enhance its competitive position" (Ferrier et al., 1999 : 378). The sources of the articles are *Nihon Keizai Shimbun*and *Nikkei Sangyo Shimbun*, Japanese general and manufacturing business newspapers published from April 1, 1997, to March 31, 2007. I considered the period from April 1 to March 31 as a fiscal year because most Japanese firms traditionally use this period as their fiscal year. The articles were collected from *Nikkei Telecom*, the comprehensive electronic archives of Japanese business newspapers.

I identified and coded the competitive actions of each firm by using structured content analysis of the

TABLE 1　List of Industries and Firms in the Sample

Industry	Firm	Year
1. Automobile tires and tubes	Bridgestone Sumitomo Rubber Industries	1997 − 2006
2. Cloths for sports, health, and work	Mizuno Goldwin	1997 − 2005
3. Fireproof brick	Shinagawa Refractories Kurosaki Harima	2001 − 2005
4. Broadcasting − Television	Nippon Television Network Fuji Television Network	1998 − 2004
5. Gasoline station	Showa Shell Sekiyu Cosmo Oil Company	1999 − 2005
6. Office machines and equipment	Canon RICOH Company	1997 − 2002
7. Cold rolling	Toyo Kohan Nippon Kinzoku	2002 − 2005
8. Light bulbs	Ushio Iwasaki Electric	1997 − 2000
9. Special civil engineering works	Toa Corporation Raito Kogyo	2000 − 2005
10. Frozen food	Nichirei Katokichi	1997 − 2000
11. Storage batteries	Japan Storage Battery YUASA	1997 − 2002
12. Men's clothing stores	Aoki International Aoyama Trading	2000 − 2004
13. Printing	Toppan Printing Dai Nippon Printing	1997 − 2000

articles about the firm (Jauch, Osborn, & Martin, 1980). First, I collected the headlines of all articles that reported the names of the firms in the sample in Table 1. There were 18,590 such articles. Second, from the collected headlines, I selected those reporting the competitive actions of the firms in the focal industries. If a certain action of a firm did not fall within the focal industry of the firm, the action was not counted. Finally, with the second coder, I checked the reliability of distinguishing competitive actions from non−competitive actions. The second coder, who works for an investment bank and who is familiar with multiple industries because of her experience with financial auditing, independently classified 1,000 articles that were randomly selected from the pool of collected articles. This number of articles reviewed by the independent coder is sufficiently large to ensure the reliability of the content analysis (Neuendorf, 2002). I used Cohen's *kappa*, an index of inter−coder reliability (Cohen, 1968) in order to check whether competitive and non−competitive actions were consistently classified. The value of Cohen's *kappa* was 0.92, which is above the general cutoff point of reliability (0.80). All disagreement on coding was solved through discussion, and

the reliability of coding competitive actions was assured.

After identifying competitive actions, I classified competitive actions into action types based on those defined by Derfus, Maggitti, Grimm, and Smith (2008). Derfus et al. (2008) identify five types of competitive actions (i.e., pricing actions, capacity actions, geographic actions, marketing actions, and product introductions) within 11 diverse industries. Consequently, their action types comprehensively cover the competitive actions of most industries. Among the five action types, I identified four action types : pricing actions, capacity actions, internationally expansion actions, and new product/process introductions. Unfortunately, marketing actions could not be precisely identified because marketing activities were extremely diverse among the sampled industries. The same second coder independently classified the competitive actions into the four action categories. The value of Cohen's *kappa* was 0.88. After computing Cohen's *kappa*, the author and coder discussed and solved the disagreement. The number of competitive actions in the sample is 793.

Total action frequency was measured as the number of competitive actions taken by the two competing firms in an industry. *Action frequency* reflects a firm's propensity for total competitive actions during a certain period. Based on previous studies (e.g., Smith et al., 1991 ; Young et al., 2000), I measured a firm's action frequency by the number of competitive actions of the firm within a year. The one−year duration was frequently used in previous studies. Then, I summed up the action frequency of the two competing firms in an industry in a year in order to calculate the total action frequency of the firms in the industry in the year. I did not use the average score for the sake of obtaining integer values in action frequency.

Average action magnitude, the level of action magnitude taken by the two competing firms in an industry, was calculated as follows. Since *action magnitude* indicates a firm's propensity for strategic actions (Smith et al., 1991), the variable is measured by the proportion of the number of strategic actions to that of all actions (i.e., including strategic and tactical actions). Strategic actions involve significant investment in fixed assets, people, and structure (e.g., Chen et al., 1992 ; Hambrick et al, 1996 ; Miller & Chen, 1994 ; Smith et al., 1991). I followed the procedure of Miller and Chen (1994), which classifies strategic actions according to action types (e.g., mergers and acquisitions are always considered strategic actions). Capacity actions and geographic expansion actions were counted as strategic actions because they always entail irreversible large−scale resource commitment. Other action types, price actions and product introductions, were counted as tactical actions. Action magnitude in a given year was calculated by dividing the number of strategic actions by that of total actions in that year. Then, I averaged the action magnitude of the two competing firms in an industry in a year as the measure of *average action magnitude*.

Independent variables. The independent variable, the *power of overlapping shareholders*, was created based on ownership of competing firms' equity. Since shareholders' power primarily depends on their equity ownership levels, I created the measure of the variable based on equity ownership. First, I identified the ten largest shareholders of all the firms in the sample and calculated their equity ownership levels. Second, I identified the shareholders that own the equity of both competing firms in an industry as overlapping shareholders. Overlapping shareholders' equity ownership levels were summed by firm.

Third, I calculated the mean of the overlapping shareholders' equity ownership share of the two competing firms and divided the value by the absolute value of their difference plus one. This measure is composed of two parts. The numerator of the measure represents joint potential power over two competing

firms because, as discussed, shareholders' power is primarily based on their equity ownership. The denominator of the measure reflects the difference in overlapping shareholders' power over two competing firms. If overlapping shareholders own the majority of one competing firm's equity, but only a small portion of the other firm's, they cannot easily manipulate *both* firms' competitive activity to pacify their rivalry, because the other firm may not follow the overlapping shareholders' order owing to their small power. If overlapping shareholders own two firms' equity at the same levels, the value of the absolute difference will be equal to 0. In order to define this variable even in that case, I added 1 to the denominator. In summary, overlapping shareholders' power over two competing firms was measured as follows :

Overlapping shareholders'power over competing firms

$$= \frac{\text{Mean of overlapping shareholders'ownership share of competing firms'equity}}{1 + |\text{Difference between overlapping shareholders'ownership share of competing firms'equity}|}.$$

The higher value of this measure indicates that the overlapping shareholders have larger power over the competing firms.

Controls. In order to avoid possible alternative explanations, I enter several control variables in estimation models. Based on Ferrier et al. (1999), which analyze dyadic interfirm rivalry between pairs of the leaders and challengers in industries and use control variables of the leaders and challengers' characteristics, these control variables are defined at the firm level. Since two competing firms existed in each industry, for the sake of clarity, I classified them into large and small firms in each industry based on the value of their total asset in the first year included in the sample.

First, the *number of the overlapping shareholders* of two competing firms was entered in estimation because the independent variable, overlapping shareholders' power, will naturally increase as the number of overlapping shareholders arises. I used the log−transformed number of the overlapping shareholders of the two competing firms in an industry as the measure of this variable.

Second, firm performance was controlled because lower firm performance urges a firm to improve its competitive position through competitive actions (Ferrier, 2001 ; Miller & Chen, 1994 ; Porter, 1980). The performance of a firm in a given year is measured by the recurring profits of the firm in that year. In order to avoid positive biases in estimation caused by ratio measures (Wiseman, 2009), I did not divide the profits by the total asset of the firm, but entered the variable as a control of firm size. Third, in the competitive dynamics literature, firm size has been reported to cause structural and competitive inertia (e.g., Miller & Chen, 1994). Firm size of was calculated using total asset.

Fourth, the influence of the large shareholders' ownership level of a firm might spuriously appear in that of overlapping shareholders' power. In order to control for the pure influence of the large shareholders, I included the variable in the statistical models, which was measured by summing up the equity ownership share of the ten largest shareholders of a focal firm. Fifth, a firm's position in a product market might affect the intensity of its competitive activity (Ferrier et al., 1999). Accordingly, I controlled for the firm's market share, which was calculated by the firm's sales in the focal industry divided by the industry's total sales.

Sixth, the action frequency and action magnitude of each competing firm were controlled for both the estimation models for the effects on total action frequency and average action magnitude. This is because

firms tend to react to their rivals' competitive actions in the same way (Chen, 1996 ; Chen & MacMillan, 1992). Accordingly, by including these variables, I can exclude the impact of rivalry in previous years on that in a given year.

Finally, to control for the unobserved year−specific effects, which potentially reside within panel data (Certo & Semadeni, 2006), I included dummy variables of years in the model. For the sake of clarity in the table of regressions, I omitted the coefficients of the year dummy variables from the table.

For clear understanding of the regression results, all the independent and control variables except dummy variables were standardized. The measures of all the variables in this study are summarized in Table 2.

TABLE 2 Description of Variables

Category	Description	Type
Dependent variables		
Total action frequency of two competing firms	The total of the numbers of competitive actions of two competing firms	continuous
Average action magnitude of two competing firms	{(one firm's strategic actions/its total actions)+ (the other's strategic actions/its total actions)}/2	continuous
Independent variable		
Overlapping shareholders' power over competing firms	Mean of overlapping shareholders' ownership share of competing firms' equity /{1+|Difference between overlapping shareholders' ownership share of competing firms' equity|}	continuous
Controls		
Overlapping shareholders' number	The natural logarithm of the number of overlapping shareholders of two competing firms	continuous
Action frequency	The number of competitive actions of large and small firms	continuous
Action magnitude	The proportion of strategic actions of large and small firms	continuous
Equity ownership of the 10 largest shareholders	10 largerst equity ownership levels of the large and small firms	continuous
Firm performance	Recurring profit of large and small firms	continuous
Total asset	Total asset of large and small firms	continuous
Market share	Large and small firms' sales of the focal industry/ total sales of the focal industry	continuous
HHI	The Herfindahl−Hirschman Index of the focal industry	continuous
Year dummy variables	Dummy variables representing years from 1998 to 2006 the base category is 1998.	discrete

Statistical Analysis

The statistical specification used in this study is twofold : fixed−effects Poisson regressions for total action frequency and fixed−effects linear regressions for average action magnitude. I used a Poisson regression model to estimate the effects on total action frequency because the dependent variable is a count number of competitive actions, which takes only integers. Since the dataset of the study is an unbalanced panel, correlations between the regressors and error terms might exist. Accordingly, I chose fixed−effects models as statistical specification, which successfully controls for firm− and industry−specific effects on the dependent variables. In order to consider the possible lagged effects of independent variables, I lagged independent variables by 1 year. 1−year lag has been commonly used in the competitive dynamics literature. The analysis was conducted on *Stata* version 12.1.

4. Results

The descriptive statistics and correlation matrix of the sampled are shown in Tables 3 and 4. Anoteworthy finding is the number of overlapping shareholders. Since the average of the variable is 1.89 and its maximum is 5, these values indicate that this variable has the wide range of values sufficient to conduct meaningful statistical analysis.

In Table 4, several variables, such as total asset and recurring profit, are highly correlated with one another. Nonetheless, multi−collinearity in regressions derived from such high correlations tends to inflate standard errors of regression coefficients. In other words, the estimated regression coefficients are more

TABLE 3　Descriptive Statistics

Variables	Mean	S.D.	Min.	Max.
1. Total action frequency t	9.94	8.81	0	40
2. Average of action magnitude $_t$	0.24	0.27	0.00	1.00
3. Power of overlapping shareholders $_{t-1}$	0.06	0.05	0.00	0.18
4. ln (Number of overlapping shareholders) $_{t-1}$	0.92	0.56	0	1.79
Large firm				
5. Action frequency $_{t-1}$	4.80	4.94	0	25
6. Action magnitude $_{t-1}$	0.28	0.34	0	1.00
7. Equity ownership of the 10 largest shareholders $_{t-1}$	0.41	0.11	0.29	0.73
8. Recurring profit $_{t-1}$ (billion yen)	10×5.44	10×7.71	−0.17	$10^2 \times 2.82$
9. Total asset $_{t-1}$ (billion yen)	$10^2 \times 8.64$	$10^2 \times 9.15$	10×7.28	$10^3 \times 2.86$
10. Market share $_{t-1}$	0.58	0.12	0.31	0.76
Small firm				
11. Action frequency $_{t-1}$	6.05	5.83	0	25
12. Action magnitude $_{t-1}$	0.30	0.32	0	1.00
13. Equity ownership of the 10 largest shareholders $_{t-1}$	0.45	0.14	0.27	0.72
14. Recurring profit $_{t-1}$ (billion yen)	10×2.27	10×2.87	−5.51	$10^2 \times 1.14$
15. Total asset $_{t-1}$ (billion yen)	$10^2 \times 4.52$	$10^2 \times 4.93$	10×6.35	$10^3 \times 1.83$
16. Market share $_{t-1}$	0.31	0.12	0.10	0.48
Market				
17. HHI $_{t-1}$	0.46	0.11	0.28	0.64

n=64.

TABLE 4   Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Total action frequency $_t$																
2. Average of action magnitude $_t$	0.08															
3. Power of overlapping shareholders $_{t-1}$	0.28*	−0.10														
4. ln(Number of overlapping shareholders) $_{t-1}$	0.16	−0.08	0.91*													
Large firm																
5. Action frequency $_{t-1}$	0.70*	0.07	0.17	0.00												
6. Action magnitude $_{t-1}$	0.12	0.42*	0.11	0.07	0.01											
7. Equity ownership of the 10 largest shareholders $_{t-1}$	−0.34*	0.36*	−0.35*	−0.41*	−0.15	0.13										
8. Recurring profit $_{t-1}$ (billion yen)	0.60*	0.06	0.30*	0.23	0.47*	0.01	−0.25*									
9. Total asset $_{t-1}$ (billion yen)	0.68*	0.12	0.40*	0.31*	0.55*	0.11	−0.35*	0.92*								
10. Market share $_{t-1}$	0.10	0.21	−0.23	−0.40*	0.06	0.19	0.26*	0.07	0.08							
Small firm																
11. Action frequency $_{t-1}$	0.75*	−0.01	0.19	0.06	0.60*	0.08	−0.29*	0.72*	0.69*	0.08						
12. Action magnitude $_{t-1}$	−0.17	0.04	0.10	0.11	−0.19	0.11	0.44*	0.09	0.03	0.04	−0.02					
13. Equity ownership of the 10 largest shareholders $_{t-1}$	−0.04	−0.01	0.31*	0.29*	−0.02	−0.01	−0.12	0.15	0.32*	−0.06	−0.05	0.11				
14. Recurring profit $_{t-1}$ (billion yen)	0.50*	−0.03	0.35*	0.27*	0.49*	−0.06	−0.01	0.68*	0.70*	−0.18	0.50*	0.24	0.08			
15. Total asset $_{t-1}$ (billion yen)	0.69*	−0.01	0.29*	0.21	0.61*	−0.03	−0.30*	0.74*	0.82*	−0.19	0.69*	0.03	0.13	0.86*		
16. Market share $_{t-1}$	−0.04	−0.28*	0.07	0.08	0.07	−0.25*	0.04	−0.25*	−0.19	−0.55*	−0.11	0.18	0.13	0.29*	0.24	
Market																
17. HHI $_{t-1}$	0.11	0.19	−0.21	−0.38*	0.12*	0.16	0.28*	−0.10	−0.04	0.89*	0.01	0.04	0.03	−0.18	−0.16	−0.20

$n = 64$. * for $p < .05$.

TABLE 5   Estimation for the Effects on Total Action Frequency and Average Action Magnitude

	Total Action Frequency[t+1]		Average Action Magnitude[t+1]	
	Model 1	Model 2	Model 3	Model 4
Intercept			0.36	0.41
			(0.13)	(0.12)
Power of overlapping shareholders		−0.38 *		−0.23 *
		(0.22)		(0.12)
Control : Interfirm				
ln (Number of overlapping shareholders)	0.26 *	0.66 *	−0.04	0.20 †
	(0.12)	(0.26)	(0.07)	(0.14)
Controls : Large firm				
Equity ownership of the 10 largest shareholders	0.09	0.11	0.18 †	0.19 †
	(0.28)	(0.28)	(0.14)	(0.13)
Recurring profit	−0.07	0.12	−0.20	−0.07
	(0.26)	(0.28)	(0.17)	(0.18)
Total asset	0.81	1.42 *	0.58 †	1.00 *
	(0.59)	(0.68)	(0.42)	(0.45)
Market share	−0.53 †	−0.61 †	0.35	0.56 †
	(0.79)	(0.80)	(0.40)	(0.40)
Action frequency	0.14 *	0.15 **		
	(0.06)	(0.06)		
Action magnitude			−0.04	−0.05 †
			(0.04)	(0.04)
Controls : Small firm				
Equity ownership of the 10 largest shareholders	0.30	0.51 †	0.05	0.20
	(0.39)	(0.36)	(0.21)	(0.21)
Recurring profit	−0.57 *	−0.63 *	0.08	0.16
	(0.32)	(0.33)	(0.13)	(0.17)
Total asset	−0.33	−1.36 †	0.52	0.09
	(0.77)	(0.98)	(0.45)	(0.48)
Market share	0.43	0.51	0.05	−0.00
	(0.36)	(0.36)	(0.21)	(0.18)
Action frequency	0.03	0.08		
	(0.11)	(0.11)		
Action magnitude			−0.06 †	−0.06 *
			(0.04)	(0.04)
Control : Market				
HHI	−0.04	−0.21	−0.03	−0.26
	(0.68)	(0.69)	(0.32)	(0.33)
Controls : Dummies				
Year dummies	Included	Included	Included	Included
Wald Chi²	32.72 *	34.92 *		
Log likelihood	−128.10	−126.63		
−2× delta (log likelihood)		2.94 †		
Within−R^2			0.49	0.55 †
Delta within−R^2				0.06 †

n=64.** for p<.01,* for p<.05, and † for p<.10. All t tests are one−tailed tests. Standard errors are in parentheses.

likely to be *non−significant* (Kennedy, 2008). Therefore, I will have to check and remedy multi−collinearity *only if* hypothesis−related variables are non−significant.

Table 5 illustrates the estimation for effects on total action frequency (Models 1 and 2) and average action magnitude (Models 3 and 4) between competing firms. Values in the columns in the tables are regression coefficients and standard errors. Since I have directional hypotheses, I used one−tailed tests for hypothesis−related variables and two−tailed tests for control variables in all models.

Model 1 in Table 5 includes only control variables. In Model 2, the variable of overlapping shareholders'power was added to test for Hypothesis 1. The hypothesis predicts that overlapping shareholders' power decreases the total action frequency between competing firms. Its estimated regression coefficient is negative and statistically significant ($b = -0.38$, $s.e. = 0.22$, $p < 0.05$). Since this result indicates that the power of overlapping shareholders decreases the total action frequency, it shows support to Hypothesis 1.

In terms of average action magnitude, in Hypothesis 2, I predicted that the power of their overlapping shareholders decreases the average action magnitude between competing firms. According to the results in Model 4 in Table 5, which includes overlapping shareholders'power and control variables, the estimated regression coefficient for the concerned variable is negative and statistically significant ($b = -0.23$, $s.e. = 0.12$, $p < 0.05$); therefore, it can be concluded that Hypothesis 2 was supported.

5. Discussion and Conclusions

This study sought to reveal the impact of overlapping shareholders of two competing firms on their interfirm rivalry. Borrowing insight from the AMC perspective and agency theory, I theorized that the overlapping shareholders of two competing firms manipulate the firms' competitive activity by influencing their awareness, motivation, and capability for competitive activity such that its intensity level will be equalized, because such parity of competitive activity possibly maximizes the overlapping shareholders' returns.

The empirical findings from data on 13 almost duopolistic industries in Japan provide support for all the hypotheses. Overlapping shareholders' power over two competing firms significantly decreases the competing firms' action frequency and magnitude. This finding is clearly consistent with the Hypotheses 1 and 2. Pacifying competitive interactions between competing firms possibly maximizes their overlapping shareholders' return. Therefore, when the overlapping shareholders have more power over the competing firms, they will manipulate the firms' competitive activity such that their action frequency and magnitude will be reduced.

Theoretical and Practical Implications

The findings of this study provide several implications that expand the theoretical horizons of competitive dynamics and agency theory. First, the empirical findings of this study indicate that interfirm rivalry of competing firms is influenced by their overlapping shareholders. As Connelly et al. (2010) and Zhang and Gimeno (2010)indicated, the influence from the capital market is one of driving forces for competitive behavior. However, although the pioneering studies found that firms determine their competitive activity following capital providers' preferences, their research focus has been limited to capital providers' influence on a *single* firm. This study further developed the theory by focusing on the context of dyadic rivalry

between two competing firms and their shareholder overlap's simultaneous influence on *multiple* firms.

Second, from the agency perspective, this study presented a theoretical model regarding why and how overlapping shareholders manipulate their competing firms' competitive activity. Although previous studies have empirically shown that shareholder overlap among firms tends to reduce competitive intensity at the industry level (e.g., Trivieri, 2007), no empirical evidence for the influence of shareholder overlap on dyadic interfirm rivalry has been provided. As the first attempt, this study found a positive relationship between the power of overlapping shareholders and the stability of competing firms' competitive interactions. This finding implies that principals (i.e., shareholders) aim to control multiple agents' (i.e., firms') activity to maximize joint returns from the agents. Accordingly, the findings of this study suggest that, when researchers investigate the relationship between a principal and an agent, they also consider other agents whose activities are potentially interactive with the agent's. In addition to this theoretical implication, this study proposes a novel measure of the power of overlapping shareholders over their competing firms, which can be used for future studies in this field.

This study also provides useful implications for practice because it is the first empirical test for the impact of shareholder overlap on interfirm rivalry. From the viewpoint of industrial policy, shareholder overlap between competing firms should be legally restricted because it might attenuate competition among firms, which results in reduction of the consumer surplus. By using power over competing firms, overlapping shareholders can create a kind of tacit collusion between firms. Such collusion may impede fair competition, which is necessary for the healthy growth of industry.

For managers, it should be noted that overlapping shareholders of competing firms may advise the firms with the intent to pacify their competitive activity, rather than to help them beat their rivals. As discussed above, overlapping shareholders can maximize the expected returns from their investment in competing firms through the stability of the firms' competitive interactions. Therefore, the overlapping shareholders intend to avoid the situation that one competing firm completely beats the other, which will not necessarily contribute to the overlapping shareholders' return. For example, although a firm's radical product introduction could expel its competing firms from a market, overlapping shareholders might put pressures on the firm to deter the radical product introduction in order to maintain the stability of their competitive activity. Accordingly, managers of a firm should take managerial advice from its overlapping shareholders with caution.

Limitations and Future Directions

The implications of this study should be interpreted with caution because this study has some inevitable limitations, which can be addressed in future studies. First, the study has exclusively focused on overlapping shareholders' influence, but has not considered other overlapping stakeholders' influence on competing firms. Large shareholders are generally recognized as one of primary stakeholders because they are providers of financial resources, which are vital for firm survival (Donaldson & Preston, 1995 ; Mitchell, Agle, & Wood, 1997 ; Pfeffer & Salancik, 1978) ; therefore, it is reasonable to expect that overlapping shareholders have a major impact on firms' competitive activity. However, other stakeholders might have power over firms to some degree because of their resources. For example, creditors are another major capital provider for firms. Likewise, overlapping suppliers could affect firms' competitive activity by

controlling supplies of goods and services. Future studies should investigate the impact of other overlapping stakeholders on competitive activity.

Second, this study has not addressed the possibility that overlapping shareholders may have different preferences for payoff horizon. For example, Connelly et al. (2010) showed that institutional investors'preference for payoff horizons appears in firms' choice between strategic and tactical actions. Based on their findings, it can be inferred that two competing firms' overlapping shareholders' preference for a pay−off horizon influences the intensity of their competitive activity. If the majority of the overlapping shareholders of competing firms are dedicated institutional investors, who tend to prefer a longer pay−off horizon, the stability of competitive interactions can be more readily achieved because they are willing to own the firms' shares for long periods. In actuality, in this Japanese context between 1997 and 2006, there were much fewer transient institutional investors than in the US ; therefore, the empirical results of this study might be derived from the dedicated institutional investors' preference for a longer payoff horizon.

Third, only 13 industries were covered in this study. Although the sample in this study only covers some of the industries in the business world, it should be emphasized that, compared to prior studies in the competitive dynamics literature, the number of industries included in this sample is not small (e.g., 13 industries in Ferrier, 2001, and 11 industries in Derfus et al., 2006). Additionally, ranging from classics to recently published works, most studies in the literature analyze rivalries in *single* industries (e.g., Boyd & Bresser, 2008 ; Chen & MacMillan, 1992 ; Smith et al., 1991 ; Marcel et al., 2011 ; Young et al., 2000). Nonetheless, although 13 may be an acceptable number of industries in the competitive dynamics literature, investigation into more diverse industries would confirm the findings of this study.

Finally, the national context of the sample, Japan, would potentially lower the generalizability of empirical findings. Japanese firms often compete intensely with one another because of a strong tendency to imitate competitors, but the Japanese societal culture emphasizes collectivism and cooperation (Hofstede, 1984). Therefore, since the stability of competitive interactions is a kind of cooperation between firms, it can be more easily achieved in Japan. Although I found empirical evidence that the power of overlapping shareholders pacifies the intensity of competing firms' competitive activity, this relationship would appear weaker in countries in which firms tend to engage in more intense competition with one another, such as the US. To confirm the generalizability of this study's findings and to ascertain the national effects on the relationship, comparative studies based on the same research design should be conducted in different national contexts.

Overall, this study examined the impact of shareholder overlap of two competing firms, which is frequently observed in the business world, on their interfirm rivalry by borrowing insights from competitive dynamics and agency theory. The study successfully extended the horizons of the two theories. Before this study, we knew only that large shareholders wield influence over a firm's competitive behavior, but we now know that overlapping shareholders jointly pacify multiple firms' competitive behavior in order to maximize their own returns.

Notes

1. In this study, I do not consider individual investors with a small number of shares of two competing firms because they have only negligible influence on the firms and are not motivated to control their competitive activity. The term, "overlapping shareholders," means "large overlapping shareholders" in this study.

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