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The Determinants of Competitive Advantage:

Capability vs. Industry Structure*

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Abstract

The purpose of this study is to investigate the effects of capability and industry structure on competitive advantage in the Japanese economy. We used one of the most comprehensive data sets for Japanese firms compiled by Teikoku Databank. While related literature primarily examined the effects of industry on competitive advantage using industry dummies, this study incorporated more sophisticated measures for industry structure. The results revealed that both capability and industry structure accounted for competitive advantage. Moreover, the opposite effects of industry structure on competitive advantage between competitive and uncompetitive firms were identified. Thus, the results indicate that capability plays a more important role in accounting for competitive advantage than industry structure.

Keywords: competitive advantage, capability, industry structure

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INTRODUCTION

Understanding the sources of variation in firm performance constitutes one of the most important issues in strategic management. The firm-industry effect debate developed based on two theoretical views: the industry-based view (Porter, 1980) and the resource-based one (Barney, 1991). The former identifies the conditions of industry structure as the major determinant of firm performance, while the latter highlights firm-specific characteristics as determinants of performance differences. Empirical studies adopt variance decomposition analysis (VCA) to examine how industry and firm dummies account for firm performance variance using either sequential regression analysis or variance component analysis (Bowman & Helfat, 2001; Brush et al., 1999), revealing the converging evidence that a large portion of variance in firm performance can be attributed to industry effects and corporate parent effects (McGahan & Porter, 1997; Roquebert et al., 1996; Rumelt, 1991). However, the VCA, which relies on either Analysis of Variance (ANOVA) or component of variance analysis, has several statistical drawbacks, making the reliability of the results questionable (Brush & Bromiley, 1997; Brush et al., 1999; Kennedy, 1985; Ruefli & Wiggins, 2003). Alternative approaches to settling the firm-industry effect debate have also been attempted, such as two-stage regression (Brush et al., 1999), multilevel analysis (Hough, 2006), structural equation models (Bou & Satorra, 2007), non-linear methods (Arend, 2009; Eriksen & Knudsen, 2003) and hierarchical regression analysis (Galbreath & Galvin, 2008). However, what

the VCA and these alternative approaches have in common is that firm and industry effects are measured as either random or fixed effects. In other words, the corresponding variables are either random or dummy variables, both of which rely on the underlying nominal scales of firms and industries. Thus, all of these methods can be understood to rely on the qualitative variable (or nominal scale) approach.

The major drawback of the qualitative variable approach is that it does not provide sufficient information regarding a more specific mechanism of performance variation. This is because relevant effects are evaluated by imprecise and noisy measures of random or dummy variables. From a theoretical perspective, it should be pointed out that industry effects do not necessarily coincide with strategic positioning within the industry. For example, the profitability of pharmaceutical firms is usually higher than that of Personal Computer (PC) manufacturers. In this sense, industry effects account for variability in profitability. However, from a theoretical and practical perspective, these industry effects are not surprising. Moreover, even in the highly competitive and less profitable PC industry, Dell achieves higher profits despite unfavorable industry effects. Industry effects alone fail to reflect these variations. Of course, this case could be expained by the firm effect using the dummy variable Dell. However, the firm dummy corresponds to firm capability rather than industry effect or strategic positioning. According to the positioning approach, a firm's competitive advantage depends on strategic positioning within the industry, rather

than the industry structure. As Dell's case clearly indicates, if the firm succeeds in establishing a unique strategic positioning even in the least attractive industry, it could achieve competitive advantage and higher profits. Although the industry structure has a significant influence on strategic positioning, it cannot differentiate variation across different firms. Strategic positioning within the industry accounts for the variation in profitability across firms. Thus, a more direct measurement of strategic positioning is required, instead of adopting industry dummy variables.

Hence, it can be concluded that the research question underlying the firm-industry effect debate has been misspecified. Instead of industry vs. firm effects, empirical examination should be centered on positioning vs. capability, both of which must be measured quantitatively, rather than qualitatively. In this study, we measured each firm's strategic positioning using Porter's Five Forces framework (Porter, 1980). Although some forces such as new entrants exert the same influence on firms in the industry, the effects of users and suppliers' bargaining power might vary across firms, implying different strategic positioning. Evaluating these forces for each firm gives rise to measures for strategic positioning.

One of the difficulties faced in this study was the measurement of capability. Obviously, firm capability is difficult to measure unless proprietary information regarding resources and capability is available. Accounting data such as tangible and intangible assets account for some variation in firm performance. However, these accounting data might be somehow correlated,

but are still conceptually distinct from capability. In the resource-based view, resources are defined as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enables the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (Barney, 1991, p. 101). Related to this, capability refers to “a special type of resource, specifically an organizationally embedded non-transferable firm-specific resource whose purpose is to improve the productivity of the other resources possessed by the firm” (Makadok, 2001, p. 389). Resources satisfying the valuable, rare, inimitable, and organizational (VRIO) criteria (Barney, 1991) are idiosyncratic and hence cannot be acquired through markets. Instead, it must be built within a firm (Teece et al., 1997). Obviously, these resources and capabilities are not reflected in the accounting data evaluated in either acquisition costs or current market values. Some studies have measured capability via questionnaire surveys (e.g., Yang, 2015). However, subjective evaluation based on the Likert-scale criteria is arbitrary because the results might differ depending on who are the respondents, even though they belong to the same firm. As a result, such measures of firm capability are unreliable.

This study adopted the Solow residual approach (Solow, 1957), that is, measuring capability as performance variances unexplained by accounting data on resources. In this approach, it is assumed that the unobserved variable of capability is reflected in residuals in which performance is regressed on observed data on firm resources, including accounting data.

Thus, it is expected that capabilities such as brand image, customer loyalty, and technology are captured by these residuals. One of the advantages of this approach is that it is objective, in contrast to subjective and arbitrary measurements.

The purpose of this study was twofold. First, this study empirically investigates the firm-industry effect debate by adopting the quantitative variable approach, instead of the qualitative one, using quantitative measures for strategic positioning and firm capability. Second, we reframe the firm-industry effect as the capability-positioning effect and examine how these two effects contribute to competitive advantage. For these to be feasible, most of the existing firms in the industry, regardless of size, must be identified because strategic positioning and competitive advantage critically depend on competitors. This study used one of the most systematic and comprehensive data available in Japan regarding Japanese firms (N=926,266) from 2009 to 2019. Because this dataset covers almost all listed and unlisted firms in Japan, including transaction partners (users and suppliers) for each firm, direct measures for strategic positioning, such as the number of rival firms, suppliers, and users, are available for empirical analysis. Moreover, competitive advantage can be measured as the above-average profitability within the industry (Porter, 1991). Using this comprehensive dataset, we examine how strategic positioning and capability account for competitive advantage.

RELATED LITERATURE AND HYPOTHESIS

Industry structure vs. strategic positioning

Based on the traditional industrial organization (IO) framework, Porter (1980) pointed out the importance of industry structure as a variable to explain performance variation. Competitive advantage is determined primarily by five forces and three generic strategies. According to this framework, variation in competitive advantage and performance is accounted for by the competitive strategy of positioning the firm within existing industry structures. Thus, it is not the industry structure, but a strategy of positioning within the industry structure that contributes to competitive advantage and performance. In this sense, the related literature on the firm-industry debate implicitly assumes a fallacy that industry structure is equivalent to strategic positioning. As described above, this assumption cannot explain why Dell achieves higher profits than rival firms, even though Dell has been facing the same undesirable industry structure. The qualitative variable approach in the VCA literature that typically adopts industry dummy variables as measures for industry effects fails to incorporate positioning variation within the industry.

While the positioning approach draws its theoretical basis on the traditional industrial organization (IO) literature (Bain, 1954, 1956), the new IO literature treads industry structure as endogenous, rather than exogenous. As long as the firm has some

market power, the conduct of the firm affects industry structure, such as the number of incumbent firms and new entrants. For example, suppose N firms exist in an industry whose marginal costs are $c_{(1)} < ... < c_{(N)}$. Under Bertrand competition, the Nash equilibrium price is $p = c_{(2)}$, so that only two firms with the costs of $c_{(1)}$ and $c_{(2)}$ survive in competition if there are no fixed costs and the former gains positive profits of $\mathrm{q}(c_{(2)} - c_{(1)})$ where q denotes the quantity sold. Unless the costs are lower than $c_{(1)}$, no firm enters the industry. As this simple example indicates, the industry structure is endogenously generated through the competitive behaviors of incumbent firms. Clearly, the lowest marginal costs of $c_{(1)}$ in this Bertrand competition correspond to firm capability, giving rise to positive profits.

Resources and capability

The resource-based view (RBV) insists that competitive advantage arises from firm resources and capabilities (Barney, 1986, 1989, 1991, 2001; Makadok & Barney, 2001; Wernerfelt, 1984). However, it goes so far as to hold that competitive advantage is driven by internal resources and capabilities, not by external factors such as industry structure (Barney, 1991). This suggests that leveraging rare and valuable resources and capabilities alone should be investigated as determinants of competitive advantage.

The common factors between resources and capabilities are idiosyncratic firm-specific

resources that are not available in markets. Hence, sustainable competitive advantage is enabled by the ability to maintain and improve VRIO routines embedded in the firm (Black & Boal, 1994; Bowman & Ambrosini, 2003; Grant, 1996; Huang et al., 2015).

Complementarity between capability and positioning

While we are sympathetic to the RBV and capability literature, they seem to pay insufficient attention to the interplay between industry structure and capability, which results in strategic positioning. The RBV insists that a firm's resource base alone should be investigated directly without any reference to the structural characteristics of an industry (Galbreath & Galvin, 2008). However, as the new IO literature clearly indicates, the industry structure and resulting strategic positioning of the firm are attributed to the firm's inherent capability. In the Bertrand competition example, competitive advantage and industry structure (the number of firms and new entrants in the industry) critically depend on the relative cost advantage of the firm (note that only the firm with the least marginal costs achieves positive profits). From the competitive strategy perspective, capability corresponds to the relative willingness to pay by customers (e.g., brand image, loyalty) and cost advantage over competitors. The wedge between willingness to pay and marginal costs accounts for competitive advantage (Ghemawat & Rivkin, 1998), as shown by the Lerner index, $(p - c)/p = 1/\varepsilon$ where ε denotes the price elasticity. $p - c$ reflects the

wedge between willingness to pay and marginal costs. The Lerner index could be regarded as capability in strategic management, which also correlates with profitability and competitive advantage.

Capability, thus reformulated as the wedge between willingness to pay and marginal costs, is highlighted by its relevance to industry structure and the resultant strategic positioning. A higher willingness to pay charges a price premium, leading to more profits, making the industry less attractive to rivals. Lower marginal costs enable the firm to charge the Bertrand price, driving costly firms out of business. Obviously, both competitive advantages discourage the entry of potential firms into the industry. The resulting strong customer loyalty is instrumental in creating bargaining power over suppliers by increasing their sales dependence on the competitively advantageous firm. Consequently, competitive advantage accruing from willingness to pay and marginal costs generates a smaller number of rival firms and raises entry barriers to the industry and bargaining power over suppliers and users. This strategic positioning in turn provides information and reputation advantage over rivals because high bargaining power over users and suppliers makes it easier to access their proprietary information, and repeated games with users and suppliers give rise to reputational effects. This clearly suggests that capability and strategic positioning are complementary to each other, which is the main hypothesis of this study.

Regarding the complementarity between capability and positioning, it should be pointed out that a favorable strategic positioning cannot be achieved without this capability. To build and sustain competitive advantage, capability must be transformed into business models and user and supplier relationships, forming a unique strategic positioning in the industry. Failure to effectively utilize capability may sometimes lead to competitive disadvantage. Thus, capability is a necessary, but not sufficient condition for competitive advantage. In addition to strategic positioning, capability accounts for higher performance.

METHODS

Data

We analyzed a widely recognized Japanese database of firms compiled by Teikoku Databank (TDB) available at the TDB Center for Advanced Empirical Research on Enterprise and Economy (TDB-CAREE). TDB is the largest credit research firm in Japan, which undertakes extensive door-to-door corporate surveys in which approximately 1,700 field researchers periodically visit almost all firms located in Japan to obtain their accounting and transactional data. One of the salient characteristics of this database is the substantial coverage of incorporated firms in Japan—the database accounts for approximately 70% of all firms in Japan (1,629,286), as identified by the Japanese

Economic Census.

The transactional data consists of annual transactional relationships with users and suppliers, covering nearly 70% of the business transactions in Japan. One limitation of this database is that it rules out international transactional data because cross-examination of foreign transaction partners is severely limited. Nevertheless, this database comprises the most comprehensive transactional data available in Japan and, to the best of our knowledge, no comparable corporate database exists outside Japan. Moreover, the transactional data includes only business-to-business (B2B) relations, not covering business-to-customer (B2C) relations. However, it should be noted that most of the firms in the B2C industries sell their products to wholesalers or retailers, and the total volume of direct sales to end users remains relatively modest, except for some industries such as retail. To account for this, we excluded industries that directly sell to individual customers, such as retail, hospitals, and education industries, from the dataset.

The accounting database, called COSMOS, comprises basic corporate information of each firm, including that of unlisted firms in the database, such as financial data, the number of employees, location of headquarters, and industry classification. For each firm, its primary and secondary businesses in terms of sales are identified and classified according to the Teikoku industry classification code characterized by a four-level hierarchical structure beginning with 14 major categories, followed by 91 medium

categories, narrowing down to 669 subcategories and 1,359 subdivisions. This classification code was originally developed by TDB so that it does not completely coincide with the US and Japanese Standard Industry Classifications (SICs). In this study, the level of subcategories was adopted as the industry classification criteria because at the lowest level of the subdivisions, the number of competitors identified in our dataset was very few (one, or at most two competitors for most cases). The subcategory level allows for more variability in terms of rivalry in the industry. After excluding industries that directly sell to individual customers (118), the number of industries considered in this study totaled 551.

This study examined the unbalanced panel data of the TDB database covering the period from 2009 to 2019 and a total of 903,939 firms in 551 industries. The mean of capital stock for the firms is 387 million yen with SD=20394826.51, and the average number of employees is 47.6 with SD=536.7. Thus, the majority of firms in this dataset are small or medium sized.

Variables

The dependent variable in this study is competitive advantage, as measured by above-average profitability. The rate of return on total assets (ROA) was used as a profitability measure because previous studies mostly adopted ROA as a performance

measure. We are well aware of the conceptual weakness of such accounting measures because the cost of capital is not taken into account. In our dataset, a substantial number of firms did not disclose their weighted average cost of capital (WACC) data. Moreover, Hawawini et al. (2003) reported that economic profit and ROA were highly correlated and empirical results were not significantly different between the two cases. To avoid dropping a large portion of firms in the dataset, we adopted ROA as a profitability measure.

For firm i in the jth industry, its competitive advantage is $\mathrm{ROA}(i;j) - \sum_k \mathrm{ROA}(k;j)/n_j$ where $\mathrm{ROA}(i;j)$ and n_j denote the ROA of firm i in the jth industry and the number of incumbent firms in the jth industry, respectively. Because this dataset covers almost all competitors in each industry, this measure indicates a performance advantage over rival firms.

For the positioning variables, we adopted Porter's Five Forces framework. The rivalry is measured by the number of incumbent firms in the industry. Similarly, the numbers of suppliers and users are used as measures for the bargaining power of suppliers and users, respectively. As these numbers increase, the firm can reduce its dependence on individual suppliers and users. Obviously, lower dependence leads to greater bargaining power of the firm over suppliers and users. The threat of entrants is measured by the number of new entrants in the industry during the current period. An increase in new entrants implies lower entry barriers and, hence, a higher threat of entry. The threat of

substitutes is measured by the difference between the sales growth of the firm and the average sales growth of the industry. For firm i in the jth industry, this is calculated as $\mathrm{SGR}\,(i;j) - \sum_k \mathrm{SGR}(k;j)/n_j$ where $\mathrm{SGR}(i;j)$ denotes the annual sales growth rate of firm i.

As a result, the firm's strategic positioning is reflected in the bargaining power of users and suppliers and the threat of substitutes. The rivalry and threat of new entrants remained the same for all firms in the industry. Thus, the latter two correspond to industry structure, and the former three indicate variation in strategic positioning within the industry structure in this study. If more detailed information were available, such as willingness to pay and marginal costs for each firm, the rivalry measures and threat of new entrants could be constructed to reflect strategic positioning, rather than industry structure. Unfortunately, given that such data were not available in this dataset, we had no other choice but to adopt industry structural variables to measure rivalry and threat of new entrants.

To construct the capability measures, we use accounting data for firm resources. They consist of tangible and intangible assets, R&D expenses, and value-added. As we will see, the latter two are used as dependent variables, and the former three are used as regressors. The residuals accounted for this capability.

Empirical model

In this study, we adopted a new approach to measure capability using only objective data, following the Solow residual procedure. Firm performance is modeled as a function of tangible and intangible assets, R&D investment, and capability. This is specified as

$$Y_{ijt} = \mu + \gamma_i \Gamma_{ijt} + \Lambda_{ijt} + \varepsilon_{ijt}, \quad (1)$$

where subscripts $i, j,$ and t denote firm ($i = 1,2,\dots,n$), industry ($j = 1,2,\dots,m$), and time, respectively; Y_{ijt} refers to firm performance (value-added); μ is a constant equal to the overall mean; Γ_{ijt} represents accounting data on resources (tangible, intangible assets, and R&D expenses); Λ_{ijt} is unobserved capability; and ε_{ijt} is a random error term. The coefficients in (2) were estimated by a regression analysis, and the predicted value of capability was calculated as

$$\widehat{\Lambda}_{ijt} = Y_{ijt} - \hat{\mu} - \hat{\gamma}_i \Gamma_{ijt}, \quad (2)$$

where the hat denotes the estimated value. Although the panel data were analyzed, we adopted the ordinary least squares (OLS) method instead of the fixed effect or random effect models. This is because the residuals calculated in the latter methods exclude firm-specific fixed or random effects. Given that firm capability should be closely associated with these firm-

specific effects, OLS was used in the estimation of (2). As for firm performance, we used value-added because factors generating high value-added could be regarded as firm-specific technology or capability so that they are also adopted while calculating Solow residuals.

The empirical model we used to examine the effects of capability, positioning, and industry structure on competitive advantage is based on the following specification:

$$CA_{i\,j\,t} = \alpha + \beta_{i\,t} + \lambda\widehat{\Lambda}_{i\,j\,t} + \delta\Theta_{i\,j\,t} + \zeta\Psi_{j\,t} + \varepsilon_{i\,j\,t}, \quad (3)$$

where $CA_{i\,j\,t}$ is competitive advantage, α is a constant equal to the overall mean, $\beta_{i\,t}$ denotes fixed or random effects of firm and time, $\Theta_{i\,j\,t}$ indicates strategic positioning of the firm, and $\Psi_{j\,t}$ refers to industry structure (the number of competitors and new entrants). Because the dataset in this study was an unbalanced panel, the regression analysis was conducted using fixed and random effect models, one of which was selected based on the Hausman test.

It should be noted here that industry structure variables $\Psi_{j\,t}$ could be endogenous in (3) because the number of competitors and new entrants critically depends on the level of competitive advantage in incumbent firms. On the one hand, if this level is sufficiently high, new entrants emerge and competitors increase. On the other hand, if this level is low, some incumbents might drop out of the industry and potential entrants have no incentive to enter the

industry. To account for this possible endogeneity effect, we estimated (3) using the instruments, which were one-year lagged variables for the number of competitors and new entrants.

RESULTS

Determinants of competitive advantage

This section presents the results of the regression analysis in (3) through the instrumental variable estimation. The results are shown in Table 1.

(Table 1)

The results clearly show that all positioning and structural parameters are highly significant in accounting for variations in competitive advantage. As for positioning, the number of users is related to competitive advantage, whereas the threat of entry has a negative effect. These results are consistent with theoretical predictions.

However, it is somewhat surprising that the number of suppliers has a negative effect on competitive advantage. According to power dependency theory (Emerson, 1962), if a firm is less dependent on a specific supplier, more bargaining power is conferred to the firm because

it can easily change the supplier when the result of a negotiation is not desirable. Nevertheless, the results of his study indicate the opposite. An alternative explanation could be found in the dual vendor system adopted by many Japanese firms. In this system, two (but sometimes more) vendors are selected to avoid dependency on a single supplier. Thus, having more than two suppliers is irrelevant to gaining bargaining power. On the contrary, purchasing from many suppliers reduces the order for each supplier, making it difficult to generate economies of scale. Moreover, long-term relationships with a few suppliers generate reputational effects and contribute to reducing transaction costs. As a result, the number of suppliers has a negative effect on competitive advantage.

Regarding the industry structure, while the number of new entrants exerts a negative effect, the number of competitors is positively related to enhancing competitive advantage—the latter is again not consistent with the Five Forces framework. This suggests that competitive advantage is generated by market competition, rather than market power, in the Japanese economy.

Competitive advantage vs. competitive disadvantage

To further explore this counterintuitive result, we split the data into two subsamples of above-average competitive firms and below-average uncompetitive firms, and conducted the same regression analyses as applied to the pooled sample. The splitting criterion is whether the

competitive advantage of a firm is above or below the mean. The results are presented in Table 2.

(Table 2)

The results indicate highly significant contrasts between the two subsamples in terms of structural and positioning effects. While both subsamples show a positive contribution of capabilities to competitive advantage, the signs of structural and positioning parameters are opposite. The competitive advantage subsample follows a pattern similar to that observed in the pooled sample. The threat of entry and substitutes exerts negative effects, which is consistent with the Five Forces framework. However, the rivalry and bargaining power of suppliers and users are positively related to competitive advantage, contradicting the framework (note that the negative effect of the number of suppliers implies a positive effect of bargaining power). This inconsistency completely disappears in the competitive disadvantage subsample, showing the negative influence. These contrasting effects suggest that the results in the pooled sample are significantly influenced by the competitive advantage subsample. This is reasonable because the determinants of competitive advantage should reflect the behavioral and structural characteristics of firms with above-average competitive advantage. The intriguing findings here are that firms with competitive disadvantage showed completely opposite effects, which were surprisingly consistent with the Five Forces framework.

One possible interpretation of these results is that the Five Forces framework

implicitly presupposes the perspective of average or below-average firms in the industry. Consider the PC industry as an example. In this industry, fierce competitive rivalry across many competitors leads to lower prices and profitability, implying that rivalry reduces competitive advantage. Although most PC firms suffer from the competitive effect of rivalry, Dell seems not to be affected by this rivalry because it has established the lowest cost advantage. As long as no PC firms exist at a lower cost than Dell, the number of competitors does not significantly affect its competitive advantage. The rivalry matters if and only if competitors with similar or superior capabilities exist in the industry at the same time. For firms with competitive advantage, rivalry could exert a positive effect on their competitive advantage by stimulating demand, such as a complementary effect across competitors in a shopping mall. However, other PC firms suffer from strong rivalry.

As for the bargaining power of suppliers, we interpreted that its negative effect in the pooled sample reflects the fact that long-term relationships with a few suppliers plays a critical role in the Japanese industry, for example, Toyota's supplier network and Dell's strategic partnership enable their just-in-time systems. Firms with competitive disadvantage fail to establish this supplier network, which results in them procuring parts and materials from many suppliers. On the one hand, within the latter group, an increase in the number of suppliers reduces the bargaining power of suppliers, leading to lower costs. Thus, the number of suppliers in this subsample has a negative effect. On the other hand, firms in the subsample of

competitive advantage could reduce the number of suppliers up to two suppliers (referred to as "dual vendor system" in Japan), but still hold strong bargaining power over suppliers. Consequently, this subsample has a negative effect on the number of suppliers.

The remaining counterintuitive results in Table 1 pertain to the number of users and the threat of new entrants in the subsample of competitive disadvantage. Regarding the number of users, typical average or below-average firms in the industry grow by establishing long-term relationships with a few specific users, rather than expanding the number of users. Thus, in the subsample of competitive disadvantage, the number of users is negatively related to competitive advantage. The expansion of the user base could enhance competitive advantage after building sufficient capability through former relationships. As a result, a positive effect of the number of users is observed in the subsample of competitive advantage.

Finally, the number of entrants in the industry relates positively to the subsample of competitive disadvantage. Note that an increase in new entrants implies that the industry is growing, providing the opportunity to expand its sales and market share. In addition, firms with competitive disadvantage do not have sufficient competitive products or services. When new entrants supply superior or more attractive products and services in the industry, it is easier to imitate new products and glean some new demand. In contrast, firms with competitive products and services are more likely to compete, rather than imitate new products introduced by new entrants, exerting a negative effect on competitive advantage. Thus, contrasting effects were

observed between the two subsamples.

DISCUSSION

In this study, we examined the effects of capabilities, positioning, and industry structure on competitive advantage. We found that capabilities, measured by value-added, were positively related to competitive advantage, and positioning and industry structure also influenced competitive advantage. One of the salient findings of this study is that their effects were completely opposite for competitive and uncompetitive firms. As a result, in the subsample of competitive firms, competitive advantage was positively related to rivalry and relative bargaining power over users and negatively related to the threat of new entrants and substitutes and bargaining power of suppliers. In the subsample of uncompetitive firms, completely opposite relationships were observed with respect to these factors, except for the threat of substitutes.

These results critically depend on the definition of the boundaries of the industry. Industry classification is primarily based on the judgment of field researchers. However, the industry classification of each firm was far from being based on arbitrary and subjective judgment. Several interviews were conducted with the managers of the firms in question, and detailed information regarding the main products and services, and the users was collected. In addition, TDB established objective criteria for industry classification shared among field

researchers so that the resulting classification and industry boundary succeeded in eliminating arbitrary manipulation. Thus, while the industry classification and definition of the boundary of the industry could be regarded as reliable, it should be noted that our results critically hinge on this industry classification. Moreover, while the TDB database includes almost all major firms with significant strategic influences in Japan (approximately 70% of all viable firms in Japan were covered in this dataset), it is probable that some firms were not listed in the database. These missing data could also bias our results.

Nevertheless, we believe that the TDB database is the most comprehensive and reliable database available in Japan. Even though some firms may be missing from the database, it is highly unlikely to bias our results statistically because the missing firms are negligible compared to the total number of firms identified in the dataset. Therefore, our results shed new light on the determinants of competitive advantage. First, the capabilities measured in this study were all positively significant in accounting for competitive advantage. This result suggests that the primary determinant of competitive advantage is capability, rather than positioning and industry structure. Even though value-added capability allowed for significant effects of structural variables, it should be emphasized that these effects critically depend on capability. Indeed, the contrasting results regarding positioning and industry structure between competitive and uncompetitive firms clearly indicate that positioning and structural effects are influenced by capabilities. The Five Forces framework implicitly assumes the perspective of

average or marginal firms in terms of competitive advantage. For example, while rivalry deteriorates the competitive advantage of average and marginal firms, it does not affect the competitive advantage of cost-advantageous firms because no other firm achieves its cost position.

As pointed out above, favorable strategic positioning cannot be achieved without this capability. To build and sustain competitive advantage, capability must be transformed into business models and user and supplier relationships, forming a unique strategic positioning in the industry. We conjectured that capability primarily accounts for competitive advantage, while the effects of positioning and structural factors on competitive advantage depends on the level of capability. This is because the latter effects are completely opposite for competitively advantaged and disadvantaged firms.

Second, the specific direction of the effects of industry structure in this study reflected the institutional background of the Japanese economy, characterized by user-supplier networks and relational contracts. The results might differ when different countries are analyzed with different institutional settings. For example, the user-supplier network is characterized by the arm's length transaction, and the effects of the number of users and suppliers might be different from our results. Thus, industry structure and its effects on competitive advantage seem to depend on the underlying institutional settings. The investigation of the relationship between institutional setting, industry structure, and competitive advantage constitutes an important

research agenda for the future.

Hence, the specific results of industry structure on competitive advantage identified in this study are critically dependent on the institutional settings underlying the Japanese economy. In this respect, our results may be specific to the Japanese economy. Indeed, several studies examining emerging economies (Hoskisson et al., 2000; Meyer & Peng, 2005; Wright et al., 2005) suggested that institutions significantly shaped strategy and competitive advantage of the firm, leading to an institution-based view (Meyer & Peng, 2005; Peng, 2003; Peng et al., 2008), which is also consistent with the economic geography literature (Beugelsdijk et al., 2010; Boschma & Iammarino, 2009; Kambhampati & McCann, 2007). Nevertheless, our analytical framework for measuring capabilities and the effects of industry structure could be applicable to other economies. Moreover, the contrasting effects of industry structure between competitive and uncompetitive firms and the primary effect of capabilities seem valid and generalizable, regardless of institutional settings. These results must be examined for different economies in the future.

CONCLUDING REMARKS

In this study, we examined the effects of capabilities and industry structure on competitive advantage in the Japanese economy. One of the strengths of our study is that we used one of the most comprehensive datasets of Japanese firms compiled by TDB, which enabled the

precise measurement of industry structure because almost all incumbent firms in the industry were identified in the dataset. As a result, rivalry could be measured by the number of firms in the industry in this dataset.

While related literature primarily examines the effects of industry on competitive advantage by using industry dummies (McGahan & Porter, 1997; Roquebert et al., 1996; Rumelt, 1991), this study could incorporate more sophisticated measures for industry structure. This analysis revealed the interesting finding that the effects of positioning and industry structure on competitive advantage are opposite for competitive and uncompetitive firms. This result indicates that capability plays a more important role in accounting for competitive advantage than industry structure. Our results add new insights to the firm-industry effect debate from an empirical perspective. We hope this line of research is also followed for other economies so that the institutional effects on the determinants of competitive advantage can be compared to the results of this study.

Table. 1

Determinants of competitive advantage

(SE in parentheses)

Variables	Coefficient	P-value
Constant Terms	6.98E-03	0.0085
	(2.65E-03)	
Capability	4.16E-04	7.29E-07
	(8.41E-05)	
# of competitors	1.87E-01	<2.20E-16
	(4.26E-03)	
# of new entrants	-2.14E-01	<2.20E-16
	(4.61E-03)	
# of suppliers	-1.98E-02	<2.20E-16
	(5.75E-04)	
# of users	7.60E-03	<2.20E-16
	(3.02E-04)	
Substitutes	-5.90E-03	<2.20E-16
	(5.84E-05)	
# of employees	1.25E-02	<2.20E-16
	(9.46E-04)	
χ^2	12180.6	<2.20E-16

N= 1,101,360. The random effect model was selected by the Hausman test (χ^2= 2.1529).

Table. 2

Determinants of competitive advantage in subsamples

(SE in parentheses)

Variables	(1) Competitive advantage		(2) Cometitive disadvantage	
	Coefficient	P-value	Coefficient	P-value
Constant Terms			-2.35E-02	3.16E-08
			(4.24E-03)	
Capability	6.19E-04	3.54E-10	6.13E-04	1.48E-06
	(9.86E-05)		(1.27E-04)	
# of competitors	2.02E-01	<2.20E-16	-3.84E-02	4.36E-10
	(3.53E-03)		(6.15E-03)	
# of new entrants	-2.34E-01	<2.20E-16	4.28E-02	5.96E-11
	(3.85E-03)		(6.53E-03)	
# of suppliers	-1.91E-02	<2.20E-16	4.32E-03	1.34E-09
	(5.04E-04)		(7.12E-04)	
# of users	6.12E-03	<2.20E-16	-1.99E-03	2.09E-07
	(2.63E-04)		(3.83E-04)	
Substitutes	-2.80E-03	<2.20E-16	-3.36E-03	<2.20E-16
	(6.58E-05)		(6.05E-05)	
# of employees	1.26E-02	<2.20E-16	-1.96E-03	0.0438
	(1.01E-03)		(9.72E-04)	
$\chi 2$	5630.08	<2.20E-16	3119.49	<2.20E-16

Column (1) is the subsample of competitively advantageous firms with N= 569,345, and the fixed effect model was selected by the Hausman test (χ^2= 5087.6). Column (2) is the subsample of competitively disadvantageous firms with N= 532,015, and the random effect model was selected by the Hausman test (χ^2= 0.093366).

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