

How Customer-Centric Structures Leverage the Effects of Advertising and R&D on Brand
Equity and Firm Performance

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Abstract

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Marketing and International Business

Academic research and marketing practice emphasize the role of advertising and R&D in building brand equity to achieve superior financial performance. Yet, prior research fails to consider that these marketing mix variables (advertising and R&D) may vary in their effectiveness depending on a firm's organizational structure. Accordingly, this dissertation offers a theoretical framework derived from configuration and contingency theories that identifies structural factors determining the effectiveness of key marketing mix variables by examining how structural sources of customer centricity leverage the effects of advertising and R&D on financial performance through brand equity. The author thus predicts and finds evidence supporting the strategic relevance of three primary structural sources of customer centricity that alter the effectiveness of advertising and R&D: a firm's *customer-centric structure*, or

organizing divisions around customer groups; *size-based centrality*, or having smaller divisions; and *scope-based centrality*, or competing in a limited set of end markets. Using multiple secondary sources of longitudinal data on publicly-traded firms over the 2005–2011 period, the author conceptually and empirically investigates the moderating effects of structural sources of customer centrality on the effects of advertising and R&D on brand equity measures (brand awareness, perceived brand quality). Results reveal that structural customer centrality generally enhances the effectiveness of advertising and R&D on perceptions of brand quality, but reduces the efficiency of advertising on brand awareness. Specifically, advertising is less efficient at generating brand awareness when a firm organizes its divisions around customer groups (customer-centric structure), and when a firm has smaller divisions (high size-based centrality). Alternatively, advertising is more effective at generating perceived brand quality as structural customer centrality increases. For instance, the effects of advertising on perceived brand quality are stronger for firms with smaller divisions (high size-based centrality), and for firms who serve narrower end markets (high scope-based centrality). Similarly, all three structural sources of customer centrality enhance the effect of R&D on brand quality. Furthermore, both brand awareness and brand quality lead to higher firm performance. Only by simultaneously considering the nature of all three structural sources of customer centrality can a firm evaluate the ultimate impacts of advertising and R&D.

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DEDICATION

To my parents and my husband for their continued encouragement, support, and love

I. Research Overview

Business enterprise has two—and only these two—basic functions: marketing and innovation.

Marketing and innovation produce results; all the rest are costs. (Drucker 1954, p. 144)

Practitioners and academics believe that a firm's marketing and innovation investments generate brand equity and improve financial performance. With this belief, marketing managers spent \$144 billion on advertising (Kantar Media 2012) and \$550 billion on R&D (Booz & Company 2011), which together represents 5% of U.S. GDP in 2011. Despite these enormous investments, empirical evidence evaluating the impacts of advertising and R&D on marketing and financial outcomes remains unclear or mixed at best (Chu and Keh 2006; Clark, Doraszelski, and Draganska 2009). Although some studies find factors that increase or decrease the effectiveness of advertising and R&D (e.g., Naik, Raman, and Winer 2005), no prior studies have considered how the returns from these two marketing mix investments (advertising and R&D) may vary according to a firm's organizational structure. This is surprising given the growing interest in customer-centric structures (Day 2006). Recognizing this gap, the Marketing Science Institute (2010; 2012, p. 8) reports that research is "needed to better understand how organizational structure and marketing capabilities influence business performance." Accordingly, this paper examines *how structural sources of customer centrality leverage the effectiveness of advertising and R&D.*

Recently, designing a firm's organizational structure to be more customer-centric has increased in popularity (Day 2006; Homburg, Workman, and Jensen 2000). In particular, a customer-centric structure—organizing a firm's business units around customer groups—has been implemented to nurture closer customer relationships and improve the effectiveness of marketing mix variables (Rust, Moorman, and Bhalla 2010; Shah et al. 2006). As a result, the

proportion of *Fortune* 500 firms with customer-centric structures has increased by 46% over the past decade according to my own examination. For example, Intel reorganized its divisions around customer groups (e.g., health care market, mobile computing market, small manufacturers) in an attempt to “bring together engineers, software writers, and marketers...to create advertising that would persuade consumers to pay a premium” (*BusinessWeek* 2005a). Also, Dell realigned its structure around customers (i.e., Large Enterprise, Public, Small and Medium Business, and Consumer division), stating that “this alignment creates a clear customer-centric focus... with faster innovation and greater responsiveness” (2010, p. 2). Despite its prevalence, most customer-centric restructuring has failed to produce any meaningful improvement in marketing mix effectiveness, and 52% of marketing executives believe a shift in their organizational structures has made no improvement in or even worsened the effectiveness of marketing (Neff 2008).

Given the mixed findings, this paper proposes that investment returns from advertising and R&D may vary according to a firm’s overall organizational structure that supports customer centricity, a concept I refer to as *structural sources of customer centricity*. With this view, organizing a firm’s primary structure around customer groups (i.e., customer-centric structure), organizing structural divisions into smaller size (i.e., size-based centricity), or organizing divisions into a fewer markets (i.e., scope-based centricity) constitutes a higher degree of customer centricity. Failing to account for the moderating effects of structural sources of customer centricity may help explain the lack of empirical support for the rewards from marketing mix investments (Day 2006). Furthermore, in line with the prior research, this study also considers two mediating mechanisms through which advertising and R&D affect firm performance. Specifically, I propose that two brand equity dimensions—brand awareness, and

perceived brand quality—explain how marketing mix effectiveness is leveraged by structural sources of customer centrality. Figure 1 illustrates my conceptual model.

To test the moderating role of each structural source of customer centrality on the effect of advertising and R&D on brand equity and financial performance, I used longitudinal data on publicly-traded firms from Harris Interactive's EquiTrend and COMPUSTAT over the 2005–2011 period. I collected information of each firm's internal structure from financial reports (i.e., Form 10-K, 10-Q), which is the most comprehensive and transparent source of secondary data available for organizational structure research. This approach thus addresses the “clear need for large-scale empirical research ... [using] secondary data analysis... [to] assess performance outcomes of various organizational structures” (Homburg, Workman, and Jensen 2000, p. 474). As an empirical test of my conceptual model, I used cluster-robust standard errors estimation (Arellano 1987; Petersen 2009), which relaxes the assumption of error independence and allows for correlation within a cluster (i.e., observations coming for the same firm but in different years).

In this paper, I contribute to the marketing literature in three major ways. First, this dissertation is the first to identify and integrate, into a single holistic model, three different structural sources of customer centrality (i.e., customer-centric structure, size-based centrality, and scope-based centrality) that may leverage the effects of advertising and R&D on firm performance through brand equity measures. Only by considering the benefits (and costs) of all three structural sources of customer centrality simultaneously can a firm evaluate the ultimate impact of advertising and R&D. Each structural source of customer centrality provides benefits by aligning internal employee groups with external markets, but with different costs, complexity levels, and methods. For example, *customer-centric structure* addresses market heterogeneity by organizing business units around customer groups, which increases costs by duplicating

infrastructure and increasing intra-firm communication complexity. *Size-based centrality* deals with market heterogeneity by reducing the size of a firm's internal units so each unit can concentrate on a less diverse end market, which adds costs by duplicating divisional infrastructure but minimizes complex interactions within each autonomous unit. Finally, a greater *scope-based centrality* limits the scope of the firm's served markets (i.e., less customer diversity), which provides centrality benefits because a firm inherently aligns with its narrow customer base. However, firms with higher scope-based centrality sacrifice their opportunity to serve or expand into other markets.

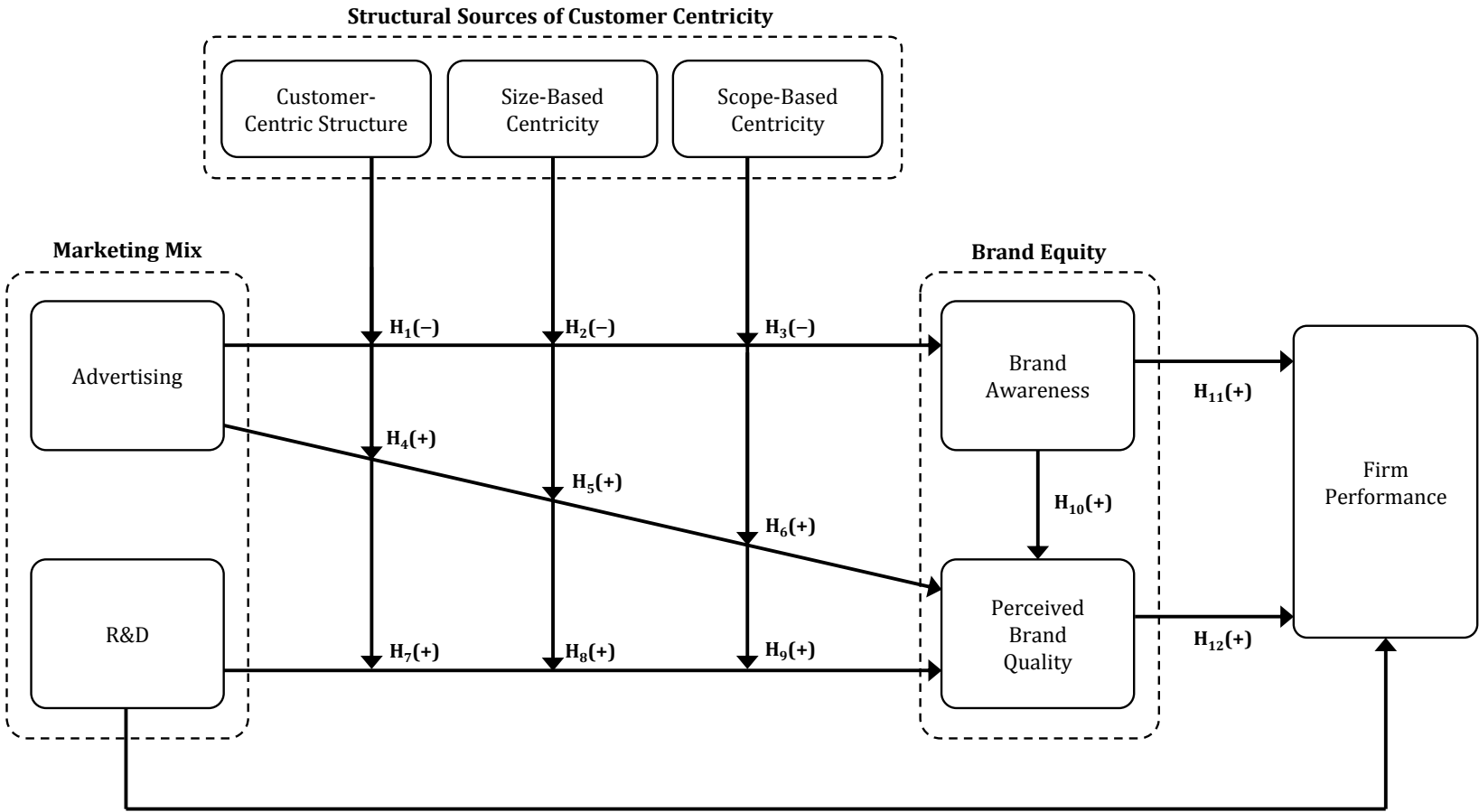
Second, because three structural sources of customer centrality exist in concert, I develop and test hypotheses regarding the moderating roles of these structural sources of customer centrality on the effects of advertising on brand awareness. Guided by configuration and contingency theories (Miller 1996; Vorhies and Morgan 2003), I propose that advertising is less efficient at generating brand awareness when a firm is more customer-centric. Specifically, the results show the negative interaction effect between advertising and customer-centric structure on brand awareness, which implies that the effect of advertising on brand awareness is less positive when a firm organizes its divisions around customer groups rather than product groups. Similarly, the impact of advertising on brand awareness is less positive when a firm has smaller divisions, or size-based centrality. These findings suggest the need for a reevaluation of research examining the impact of advertising investment on brand equity because this effect is contingent on customer centrality that emanate from a firm's organizational structure.

Third, I demonstrate the moderating effects of these structural sources of customer centrality on the effects of advertising and R&D investments on perceived brand quality. In contrast to the moderating effects of structural sources of customer centrality on the advertising-brand

awareness relationship, I find that advertising and R&D are more effective at generating perceived brand quality when a firm is more customer-centric. Specifically, the results indicate that greater advertising investments will create higher brand quality as a firm has smaller divisions, or focuses on a narrow set of end markets. In addition, I find the positive interaction effects between R&D and all three structural sources of customer centrality on perceived brand quality, implying that increased investment in R&D will create higher brand quality as a firm adopts a customer-centric structure instead of product-centric structure, has small granular divisions, or focuses on a limited set of end markets. These findings are consistent with Day's argument (1999, p. 188) that each organizational structure "imposes painful trade-offs" because the results suggest that structural sources of customer centrality weaken the efficiency of advertising, but enhance the effectiveness of advertising and R&D.

Overall, this study provides theoretical and empirical insights to clarify the mixed picture around the returns to advertising and R&D by aggregating three structural sources of customer centrality (Day 2006; Shah et al. 2006). The findings show that structural centrality impacts the efficiency and effectiveness of two of the largest marketing mix investments in parallel fashion, but, interestingly, a post hoc analysis shows the differential effects of structural sources of customer centrality across advertising and R&D profiles. Specifically, depending on advertising and R&D profiles, the performance changes range from -48% to $+24\%$ for a customer-centric versus product-centric structure, from -37% to $+36\%$ for high versus low size-based centrality, and from -24% to $+40\%$ for high versus low scope-based centrality. Therefore, managers should consider their structural sources of customer centrality that influence firms' market-relating capabilities (centricity benefits) and aggravate duplication and complexity (centricity costs) when making a decision on advertising and R&D.

FIGURE 1
How Customer-Centric Structures Leverage the Effects of Advertising and R&D on Brand Equity and Firm Performance



II. Literature Review

1. *Conceptual Background of Brand Equity*

Brand equity or customer-based brand equity is the value added to a product or service by its association with a brand name and/or symbol (Aaker 1991). Brand equity also has been conceptualized as a multi-faceted construct, defined as “the differential effect of brand knowledge on consumer response to the marketing of the brand” (Keller 1993, p. 1). According to this definition, a high level of brand equity implies that consumers are more aware of the brands and perceive the brand to be of higher quality, which in turn will increase the brand loyalty (Buil, Chernatony, and Martínez 2013), reduce a firm risk (Rego, Billett, and Morgan 2009), decrease share price volatility (Johansson, Dimofte, and Mazvancheryl 2012), and increase firm performance (Peterson and Jeong 2010). Researchers generally have focused on two key dimensions of brand equity: brand awareness and perceived brand quality. It is notable that “brand quality” is interchangeably used with “perceived brand quality” and “perceptions of brand quality” in marketing literature (Bharadwaj, Tuli, and Bonfrer 2011), and I use “brand quality” in place of “perceived brand quality” for the ease of exposition.

Brand awareness. The first component of brand equity is brand awareness (i.e., brand familiarity, top-of-mind awareness), which refers to *the extent to which customers are able to recognize and recall a firm’s brands* (Keller 1993). A key element of higher brand awareness in a mind of consumers is the strength of brand associations in memory. In line with behavioral learning theory and memory network model (Johnson and Russo 1984; Krishnan 1996), the brand awareness creates value by providing anchor to which other association can be attached, giving a sense of familiarity, sending a signal of commitment, and being a member of the consideration set (Aaker 1991). Marketing scholars demonstrate that improved brand name

accessibility is sufficient to increase brand choice probability in low involvement decision settings regardless of a concurrent change in brand attitude (Keller 1993; Nedungadi 1990).

For a brand to be selected in memory-based choice, firms invest on marketing programs to improve consumer learning and thus affect subsequent recall for brand-related information (Keller 1993; Rossiter and Percy 1997). Because “recall is difficult, requiring either an in-depth learning experience of many repetition” (Aaker 1991, p. 76), frequent and consistent exposure to the brand or related advertising is necessary to allow customers to be more familiarity with brands or to have top-of-mind awareness (Campbell and Keller 2003). As such, it has long been believed that firms need to make investments in marketing mix to maintain brand awareness.

Perceived brand quality. Perceived brand quality (i.e., brand quality, brand image) refers to *consumers' perception on how well a brand meets their requirements and expectations* (Bharadwaj, Tuli, and Bonfrer 2011; Keller 1993; Mitra and Golder 2006). It is “the overall subjective judgment of quality relative to the expectation of quality” (Mitra and Golder 2006, p. 231), which is different from the objective quality, defined as “aggregate performance of all vector product attributes” (p. 231). Higher perceived brand quality creates intangible value by providing a pivotal reason-to-buy, differentiating and positioning the brand, and creating positive attitudes and feelings (Aaker 1991). In support of the view that the effect of the brand quality cannot be readily or easily duplicated (Capron and Hulland 1999), Aaker (1991, p. 111) notes that “if a brand is well positioned upon a key attribute in the product class..., competitors will find it hard to attack”. Also, perceived expense of a brand’s advertising campaign operates as an extrinsic quality cue, and creates consumers' product quality expectations when the marketer's confidence in product quality is salient (Kirmani and Wright 1989). Indeed, advertising expenditure and perceived quality have a positive association after accounting for objective

quality, price, and market share (Moorthy and Zhao 2000). Collectively, brands with strong images provide customers value propositions that could not be achieved by competitors.

To convey a higher brand quality to a target segment, firms often develop marketing communication programs (Park, Jaworski, and MacInnis 1986). Specifically, marketing literature has documented the sustaining and accumulative effect of advertising investments in consumer brand image and attitude (Mela, Gupta, and Lehmann 1997; Vakratsas and Ambler 1999). A well-communicated image should help establish a brand's position, insulate the brand from competition, and therefore enhance the brand's market performance (Lane and Jacobson 1995).

2. Advertising and R&D as Drivers of Brand Equity

A considerable amount of conceptual and empirical research has well documented that advertising and R&D investments are key drivers of brand equity (Ailawadi, Lehmann, and Neslin 2003) and firm performance (McAlister, Srinivasan, and Kim 2007; Mizik and Jacobson 2003; Srinivasan, Lilien, and Sridhar 2011). Specifically, two marketing mix elements, advertising and R&D, influence consumer's perception on brands and result in increased performance (Srivastava, Shervani, and Fahey 1998). I first discuss the effects of the firm's advertising spending on brand awareness and perceived brand quality, and then discuss the effects of R&D spending on perceived brand quality.

Advertising. Advertising is a marketing communication tool that makes statements about the attributes of products and services. A large body of work indicates that a firm's substantial and historic investments in advertising build psychological connection between a firm's brands and consumers, which in turn build strong brand equity (Blattberg, Briesch, and Fox 1995; Simon and Sullivan 1993; Yoo, Donthu, and Lee 2000). Previous literature uses the term advertising expenditure interchangeably with "advertising intensity", "advertising quantity", and

“advertising frequency” (Erdem, Keane, and Sun 2008). In particular, advertising has been considered as a fundamental driver of two components of brand equity—brand awareness and perceived brand quality—that resides in customers’ mind (Keller 1993).

Extant research has shown that a firm’s advertising expenditure increases brand awareness in two major ways. First, a firm’s advertising helps customers recognize brands and certain features of products by drawing customers’ attentions and providing familiarity from past exposure (Campbell and Keller 2003). At the point of purchase, for example, customers in the store are more likely to choose advertised brand than unadvertised one because the most familiar or recognizable brand name will probably provide customers’ confidence in the decision process (Keller 1993; Yoo, Donthu, and Lee 2000).

Second, advertising provides customers top-of-mind recall by encouraging learning through memory. Specifically, a firm’s persistent and repetitive advertising enhances memory by strengthening memory traces because it increases redundancy and provides more encoding opportunities to process the message, leading to higher level of brand recall (Percy and Rossiter 1992). Consistent with Aaker’s (1991, p. 73) view that “advertising is well-suited to generating awareness because it allows the message and audience to be tailored to the job at hand and because it is generally an efficient way to gain exposures”, brands with higher advertising spending yield substantially greater levels of brand awareness and brand equity (Cobb-Walgren, Ruble, and Donthu 1995).

However, some empirical findings on this link are often unclear and even mixed. For example, some researchers find that increasing advertising expenditures has no significant effect on increasing brand awareness (Huang and Sarigöllü 2012). In an attempt to explain the mixed findings, scholars have integrated some contingent factors that influence the relationship between

advertising and brand awareness. For example, promotion negatively moderates the impact of advertising, thereby reducing the effectiveness of advertising in brand shares (Naik, Raman, and Winer 2005). Also, Wang, Zhang, and Ouyang (2009) find that brand equity is generally positively and persistently enhanced (versus enhanced following decay) by advertising but large industry size and low industry concentration positively moderate the relationship between advertising and persistently enhanced brand equity. Thus, it is important to consider other moderating factors that help explain the link.

In addition, a firm's advertising expenditure not only increases brand awareness but also increases perceived brand quality (Rice and Bennett 1998). Specifically, perceived expense of a brand's advertising campaign operates as an extrinsic quality cue, and creates consumers' product quality expectations when the marketer's confidence in product quality is salient (Kirmani and Wright 1989; Milgrom and Roberts 1986). Independent of information contents of advertising, the volume of advertising serves as a quality signal because it informs consumers that the firm believes the products are worth advertising (Nelson 1974). Even after accounting for objective quality, price, and market share, advertising expenditure and perceived quality have a positive association (Moorthy and Zhao 2000). Also, customers often rely on the advertising messages of the brand for assisting in determining product/brand quality, so greater level of advertising spending increases the probability of increased brand quality (Cobb-Walgreen, Ruble, and Donthu 1995). Indeed, increased advertising expenditure can act as "general indicators of quality across all types of products" (Zeithaml 1988, p. 8) and as "a sign of marketer's confidence in a new product's success" (Kirmani and Wright 1989, p. 344).

Yet, empirical findings on this link often remain inconsistent. For example, Clark, Doraszelski, and Draganska (2009) found that advertising has consistently a significant positive

effect on brand awareness but no significant effect on perceived brand quality. Also, consumers' perceptions of a brand's advertising has no impact on perceived quality but a positive impact on brand awareness (Buil, Chernatony, and Martínez 2013). Thus, it is important to consider other moderating factors that help explain the relationship between advertising and perceived brand quality.

R&D. Extant research suggests that R&D spending is a key factor that creates brand equity (Ailawadi, Lehmann, and Neslin 2003), increases stock returns (Mizik and Jacobson 2003), and generates greater profitability (Capon, Farley, and Hoenig 1990). Firms invest on R&D activities in an attempt to create innovative products that can be sought by consumers, which results in greater perceived brand quality (Peterson and Jeong 2010). For example, pharmaceutical and computer software firms such as Pfizer and Microsoft heavily invest on new product development to continue to maintain its innovativeness. It should be noted that I do not focus on the effect of R&D on brand awareness but perceived brand quality because R&D is more relevant to the internal process that affects the perceived quality of products/services rather than external communication process that affects brand awareness.

Although there has been abundant attentions on the effect of advertising on brand quality, studies on the link between R&D and brand quality is very limited. Many marketing scholars speculate that R&D increases brand equity (e.g., Simon and Sullivan 1993), but even the existing findings are mixed. For example, a recent study by Peterson and Jeong (2010) shows that R&D and advertising expenditures have a positive impact on brand value, and that the resultant brand value increases a firm's financial performance, but Chu and Keh (2006) have different findings. While the authors hypothesize R&D and advertising effects on brand value creation, the effect of R&D expense on brand value is weak. Thus, it is imperative to study the missing moderators that

can explain inconsistent findings. In Table 1, I summarize the literature review of the effects of advertising and R&D on brand equity.

3. Marketing Mix and Organizational Structure

Organizational design theorists suggest that firms can increase the impact of marketing mix by building organizational structure that facilitates a shared focus on solving customers' problems across decision makers and activities (Galbraith 2005; Gulati 2009; Homburg, Workman, and Jensen 2000). While extant literatures have examined the role of organizational structure in influencing the impact of marketing mix on various outcomes, they have two major limitations. First, the focus of the extant research has been limited to the bureaucratic factors (e.g., centralization, formalization, specialization) that measure policies or rules that dictate employees' behaviors rather than "hard" structural forms. This parallels Workman and colleagues' argument (1998, p. 26) that most marketing research shows "an overreliance on the bureaucratic dimension". To mitigate the research gap, I focus on enterprise-level organizational structure that "support market-driven values and behavior and reinforce desired behavior across the business" (Day 1990, p. 361).

Second, the role of organizational structure on marketing mix has been thought to be causative rather than facilitative (Duncan and Moriarty 1998; Galbraith and Merrill 1991; Griffin and Hauser 1996; Miller 1988; Vorhies 1998). For example, Menon and colleagues (1999) demonstrated that centralization is positively associated with marketing activities such as advertising. Even some of the studies examining the moderating relationship do not provide clear guidance on how different structural sources of customer centricity may moderate the effectiveness of marketing mix (Argyres and Silverman 2004; Markides and Williamson 1996). Consequently, it warrants further investigation on the moderating role of organizational structure

design elements that are conducive to enhancing the returns from advertising and R&D investments. Thus, this paper proposes a conceptual model that focuses on the moderating effects of organizational structures on the effects of marketing mix on brand equity. In Table 2, I summarize the relationship between marketing mix and organizational structure.

4. Organizational Structural Sources of Customer Centricity

Previous literature has discussed ways to increase a firm's *customer centricity*, defined as the degree to which a unit's decision makers and activities are guided by the common goal of satisfying customers (Day 1999). Other terms such as "customer-focused" or "customer-oriented" similarly differentiate between customer-centric and product-centric firms (see Shah et al. 2006). In line with organizational design theory (Galbraith, Downey, and Kates 2002), marketing scholars compare customer-centric leadership, culture, incentives, systems, and processes with a more traditional product-centric approach to understand how and to what extent these organizational design dimensions affect firm performance (Kumar, Venkatesan, and Reinartz 2008). Despite the widespread belief that *organizational structure* is an important design element for making a firm more customer-centric and improving its performance, "there has been relatively little discussion" of various roles of customer-centric structures (Homburg, Workman, and Jensen 2000, p. 469). It is noteworthy that the widely researched "market orientation" construct, which typically refers to a firm's specific norms and climate that support the continuous creation of superior value for customers, often gets described as culture rather than structure (Homburg, Workman, and Jensen 2000; Narver and Slater 1990).

Researchers often investigate the impacts of various organizational design dimensions that might make a firm more customer-centric and enhance performance. For example, empirical research in marketing shows that customer-centric leadership and culture (Homburg and Pflesser

2000), metrics and incentives (Kirca, Jayachandran, and Bearden 2005), and systems and processes (Kumar, Venkatesan, and Reinartz 2008) improve relational and financial performance outcomes. In addition, various studies combine multiple organizational design dimensions into an aggregate measure of organizational support for customer centricity and find a positive link to performance (Becker, Greve, and Albers 2009; Jayachandran et al. 2005; Reinartz, Krafft, and Hoyer 2004).

I use the term *organizational structural sources of customer centricity* to refer to structural design elements that promote a firm's customer centricity by affecting the alignment between its internal units and external markets (or customer segments). Most scholars and managers focus on achieving centricity benefits by restructuring divisions around customer groups (customer-centric structure), though some also recognize other "structural remedies" (Day 1990, p. 361). I propose three different structural sources of customer centricity (customer-centric structure, size-based centricity, scope-based centricity), and argue that an integrated perspective is needed to understand their combined effect on evaluating the effectiveness of advertising and R&D: the firm's *size-based centricity*, or the extent to which it divides itself into small structural divisions, and its *scope-based centricity*, or the extent to which the firm competes in a limited set of end markets. Each structural source of customer centricity provides benefits by aligning internal employee groups with external market groups, at varying levels of costs and complexity. That is, a firm can understand the impacts of advertising and R&D only by simultaneously considering the benefits and costs of all three structural sources of customer centricity.

Extant research has largely ignored the inherent "customer centricity" benefits provided by size-based centricity and scope-based centricity. I consider both size-based centricity and scope-based centricity as "organic" structural sources of customer centricity, because they tend to be

beyond the control of managers and are intrinsic to the firm's core strategy (Phan and Hill 1995). Managers often consider structural alignment a more accessible path for increasing customer focus, rather than increasing size-based centrality by dividing the firm into smaller units or increasing scope-based centrality by divesting of non-core customer groups.

Customer-centric structure. Customer-centric structure—defined as whether a firm's primary organizational structure (i.e., business units, divisions) immediately below the level of the CEO are organized around customer groups, instead of product groups—is the most commonly recognized means to build a customer-centric organization (Becker, Greve, and Albers 2009; Day 2006). Although it is not unusual to find various structures at different layers of organization, I focus on the organizational structure at the top management level because: (1) decisions made at the top level dictate the way organizational entities at the lower level (e.g., sales, marketing organization) are managed; (2) the top-level structure illustrates the assignment of responsibilities to senior executives who determine a firm's overall strategy; and (3) the top-level structure can be held clearly accountable for its own profit and loss (P&L) statement that a firm discloses in legal filings (Financial Accounting Standards Board (FASB) 1997).

To clarify the definition of customer-centric structures I describe in the dissertation, I provide an organization chart of Intel Corporation in Figure 2. As Panel A of Figure 2 shows, a semiconductor firm Intel once organized its divisions around product groups. As resources and activities were grouped by the type of products being manufactured and sold, each division ended up pushing different product offerings to the same customer without first identifying what the customer's true needs are. Recognizing these problems, in 2005, Intel reorganized away from product lines by creating five new customer-focused divisions as shown in Panel B of Figure 2. Each of the newly created divisions responded to a particular set of buyers and developed a

unique set of solutions. Thus, I compare the customer-centric structure with a more traditional product-centric structure.

Organizing a firm's structure around customer groups supports customer centrality by building accountability for managing relationships with customers (Homburg, Workman, and Jensen 2000; Shah et al. 2006), creating a shared within-unit focus on customers, increasing customer insight, and providing a single customer contact point (Day 2006). In contrast, in a firm with product-based divisions, multiple divisions might target the same customers, creating confusion for customers and disrupting relationship-building efforts (Day 1999; Rust, Moorman, and Bhalla 2010).

In addition, adopting a customer-centric structure enhances a firm's ability to use customer-specific knowledge. Each customer-centric division concentrates similar customer/market-specific information within specific employees, who can then better identify trends, unique needs, and common problems (Jayachandran et al. 2005). Firms that quickly identify an emerging trend or problem also can respond more rapidly, which should increase customer satisfaction. Alternatively, firms organized around product groups cannot identify and act on customer- or market-specific changes as easily or quickly, because each employee deals with diverse customers and markets and thus would have trouble in detecting changes in any single customer or market group. Overall, a customer-centric structure allows firms to better interpret and predict customer behaviors, which then enables them to satisfy customer needs better (Yim, Anderson, and Swaminathan 2004).

Aligning divisions to mirror customer groups also comes with a cost (Galbraith, Downey, and Kates 2002). Adopting a customer-centric structure increases internal inefficiency, because complex reporting relationships arise between front-end (customer-facing) and back-end

(product-producing) operations. Managers must ensure that sales calls transcend product silos and decision-making processes cross functional boundaries, which often increases coordinating costs to resolve dissonance among different functions and units in more complex structures (Day 2006; Gulati 2007; Homburg, Workman, and Jensen 2000). For example, Hewlett-Packard dismantled a major part of its customer-focused structure after recognizing that the coordination costs of its customer-focused structure outweighed the benefits (*BusinessWeek* 2005b).

Furthermore, a customer-centric structure requires infrastructure duplication and sacrifices scale economies. For example, Cisco Systems retreated from a customer-centric structure due to the costs associated with producing and selling “the same or similar products [to] different customer segments” (Gulati 2007, p. 102). In this situation, each customer-dedicated division delivers different versions of a similar product and often competes for scarce resources, so management costs increase with the effort to coordinate rivalries among structural units (Galbraith, Downey, and Kates 2002). Overall, a customer-centric structure requires a duplication of infrastructure and functions, so structural complexity arises and must be resolved through sophisticated internal coordination mechanisms (Gulati 2007; Olson, Walker, and Ruekert 1995).

Size-based centrality. A less recognized structural source of customer centrality is size-based centrality, which captures the inherent customer centrality that occurs when a firm divides itself into small structural divisions. Disaggregating a firm into smaller structural divisions increases customer centrality by allowing each division to “better focus on particular businesses” and “speed-up decision making” (Brickley and Van Drunen 1990, p. 260). For example, when Pfizer split up into smaller business divisions, each division could remain “focused on certain types of patients and certain types of diseases,” such that the oncology division had full accountability for

performance only in the cancer patient segment (*BusinessWeek* 2009). In Figure 3, I compare a firm with high size-based centrality (Panel A) and a firm with low size-based centrality (Panel B).

Management research has studied the effects of size-based centrality (e.g., granularity, organizational disaggregation, divisionalization) but without necessarily focusing on “customer centrality” benefits. For instance, Microsoft tries to limit its units to 200 employees at most, so they do not become muddled by many divergent problems (Eisenhardt and Brown 1999). This form of centrality offers benefits by suppressing managers’ cognitive workload, increasing the speed of customer responses, reducing the diversity of customer problems, decreasing internal communication complexity, and encouraging “convenient, frequent, and informal interactions among all members” (Mintzberg 1983, p. 68), especially as traditional barriers break down and personnel from different functional backgrounds intermingle (Child and McGrath 2001; Ruekert and Walker 1987).

However, greater size-based centrality often leads to sacrifices of economies of scale, the creation of functional redundancies, and greater resource competition among units offset some of these centrality benefits (Eisenhardt and Brown 1999; Lawler 1996; Workman, Homburg, and Gruner 1998). Smaller divisions inherently provide centrality benefits, but some customers still may need to interact with multiple divisions, which would require firms to institute additional customer-centric processes (e.g., sales programs) that reduce the customer’s communication burden (Kumar, Venkatesan, and Reinartz 2008).

Scope-based centrality. Scope-based centrality refers to the extent to which a firm competes in a limited set of end markets. Firms that compete in a limited set of end markets are inherently more aligned with their customers, regardless of other structural design characteristics, because their customer portfolios are less heterogeneous. For example, Intel Corporation eliminated its

web hosting business division to increase its focus on microprocessors, which reduced the diversity of customer problems and activities that it needed to address (Vance and Weiss 2002). Reducing diversity concentrates information into a few market segments and increases institutional knowledge, which leads to synergies for both resources and information (Hoskisson and Johnson 1992). A scope-based centrality (e.g., concentration, focus, downscoping, deconglomeration) typically helps firms gather more detailed information about customers and respond to their needs (Markides 1992; Varadarajan, Jayachandran, and White 2001). In Figure 4, I compare a firm with high scope-based centrality (Panel A) and a firm with low scope-based centrality (Panel B).

However, restricting business to a limited set of end markets means sacrificing the opportunity to grow by serving other markets and may fail to optimize resource uses. Increasing scope-based centrality thus may reduce the firm's ability to build scale efficiencies in backend operations, which increases costs relative to other firms that serve broader sets of end markets (McDougall et al. 1994).

Overall, benefits from structural sources of customer centrality enhance various market-relating capabilities, including customer accountability, customer communication (through a single contact), marketing sensing, and response times to changing customer needs (Day 1999; Shah et al. 2006). On the other hand, each source of centrality provokes costs associated with duplicating infrastructure, increasing coordinating complexity, or restricting access to new growth markets. Such costs can undermine business performance by adding to personnel costs, increasing the time and effort required for effective communication, and limiting sales growth in new markets (Gulati 2007; Homburg, Workman, and Jensen 2000). Extant research has often ignored the intrinsic centrality benefits provided by size-based centrality and scope-based

centricity when considering a customer-centric structure. Such structures may appear beyond the control of managers. A customer-centric structure increases centricity by directly matching internal units with customer groups, without any change to or restriction on the external customers or markets being served. Thus, managers consider it a more accessible path to increasing centricity, compared with dividing their customers across different business unit managers or divesting poorly fitting customers. In Table 3, I summarize the characteristics of three structural sources of customer centricity.

TABLE 1
Literature Review on the Impact of Advertising and R&D on Brand Equity

Study	Construct	Context	Key Findings/Propositions
Ailawadi, Lehmann, and Neslin (2003)	Advertising, R&D, Revenue premium, price elasticity	203 brands in consumer packaged goods industry	Brand equity is measured as revenue premium. Advertising enhances brand equity, and products with strong brand equity lose relatively little share when price is increased and experience significant gains when price is decreased as compared with low brand equity products. Also, R&D creates brand equity.
Blattberg, Briesch, and Fox (1995)	Advertising, promotion, brand equity	Literature review for empirical generalization	Higher brand equity from advertising activities results in asymmetric switching such that highly advertised brand is less vulnerable to competitors' promotions.
Buil, Chernatony, and Martínez (2013)	Advertising, promotions, brand equity	Survey of 302 United Kingdom consumers	Consumers' perceptions of a brand's advertising spend has no impact on perceived quality but a positive impact on brand awareness. Also, brand awareness increases perceived quality.
Campbell and Keller (2003)	Advertising repetition effects, brand familiarity	Experiment	Firm's advertising helps customers recognize brands and certain features of products by drawing customers' attentions and providing familiarity from past exposure.
Chu and Keh (2006)	R&D, advertising, promotion, brand value	73 brands from Interbrand-Business Week	While authors hypothesize R&D, advertising and promotional effects on brand value creation, the effect of R&D expense on brand value is the weakest since it is confounded with the advertising and promotional effects. Advertising contributes most effectively to brand value.
Clark, Doraszelski, and Draganska (2009)	Brand-level advertising, brand awareness, perceived quality	348 brands	Advertising has consistently a significant positive effect on brand awareness but no significant effect on perceived brand quality.
Cobb-Walgren, Ruble, and Donthu (1995)	Advertising, perceived brand quality, brand equity	Experiments on 28 cleanser users and 45 hotel users	Customers often rely on the advertising messages of the brand for assisting in determining product/brand quality. Also, advertising more heavily affects products with lower risk and involvement than products at the other end of the spectrum.
Huang and Sarigöllü (2012)	Advertising, distribution, price promotion, brand awareness	11 brands in a consumer-packaged goods category	While distribution, price promotion and price have significant effect on brand awareness, advertising does not predict brand awareness.
Keller (1993)	Brand equity, brand awareness, advertising	Conceptual paper on brand equity	Firm's advertising efforts increase consumer exposure to the brand, enhance brand awareness, and affect consumers' ability to recall brands.
Kirmani and Wright (1989)	Advertising expense, expected product quality	Experiment	Perceived expense of a brand's advertising campaign operates as an extrinsic quality cue, and creates consumers' product quality expectations when the marketer's confidence in product quality is salient.
Moorthy and Zhao (2000)	Advertising spending, perceived quality	162 brands from 10 product categories	Advertising expenditure and perceived quality have a positive association after accounting for objective quality, price, and market share.
Percy and Rossiter (1992)	Advertising strategy, brand awareness, brand attitude	Conceptual paper	Firm's persistent and repetitive advertising enhances memory by strengthening memory traces because it increases redundancy and provides more encoding opportunities to process the message, leading to higher level of brand recall.
Peterson and Jeong (2010)	R&D, advertising, brand value, financial performance	125 firms from Interbrand Group's annual reports of the 100 most valuable brands	R&D and advertising have a positive impact on brand value, the resultant brand value increases a firm's financial performance. It is proposed that there exists lagged relationships between expenditures and brand value, brand value and firm financial performance.
Simon and Sullivan (1993)	R&D, advertising, brand value	638 firms in manufacturing industries	R&D could affect brand equity when innovation is important to consumers. Also, advertising increases brand awareness and perceived brand quality.
Wang, Zhang, and Ouyang (2009)	Brand equity, advertising	367 companies across 32 industries	Brand equity is generally positively and persistently enhanced (vs. enhanced following decay) by advertising. Large industry size and low industry concentration positively moderate the relationship between advertising and persistently enhanced brand equity.
Yoo, Donthu, and Lee (2000)	Marketing mix, advertising, brand awareness, brand quality, brand loyalty	Survey of 569 college students	Customers in the store are more likely to choose advertised brand than unadvertised one because the most familiar or recognizable brand name will probably provide customers' confidence in the decision process. Advertising has a positive impact on brand awareness, brand quality, and brand loyalty.

TABLE 2
Literature Review of Advertising, R&D, and Organizational Structure

Reference	Main Focus	Context	Theory	Unit of Analysis	Structural Design Elements	Causative or Moderating Relationship	Findings
Relationship between Advertising and Organizational Structure							
Duncan and Moriarty (1998)	Conceptual model about communication-based model of relationship marketing	Theoretical discussion	Marketing and communication theory	Firm	<ul style="list-style-type: none"> • Cross-functional management 	Causative relationship between structure and marketing mix	Cross-functional management makes it possible to plan and monitor brand messages (e.g., advertising) going to and coming from all divisions.
Galbraith and Merrill (1991)	Impact various compensation programs on business level strategy	79 SBUs from technology-intensive firms	Configuration theory	SBU	<ul style="list-style-type: none"> • Formalization • Centralization 	Causative relationship between structure and marketing mix	Centralization of management decisions increases marketing-oriented expenditures such as advertising spending.
Markides and Williamson (1996)	Related diversification and moderating effects of strategic assets	Survey of 457 CEOs	Resource-based view	Firm	<ul style="list-style-type: none"> • Multidivisional and U-form organizational structure 	Moderating relationship between structure and marketing mix	Centralized multidivisional-form structure does not moderate the effect of umbrella branding strategy through media advertising on profitability.
Menon et al. (1999)	Review of marketing strategy making	Survey of 212 senior executives of SBUs	Upper-echelons theory and resource-based view	SBU	<ul style="list-style-type: none"> • Formalization • Centralization 	Causative relationship between structure and marketing mix	Centralization is associated positively with the emphasis on marketing assets and capabilities.
Miller (1988)	Relationships of Porter's business strategies to the organizational structures and environments	Survey of 89 undiversified firms	Contingency theory	Firm	<ul style="list-style-type: none"> • The use of liaison devices, technocrats, and delegation. 	Causative relationship between structure and marketing mix	Launching a new advertising campaign (or marketing differentiation strategy) will not be associated with the use of technocrats, liaison devices, or delegation of authority.
Workman, Homburg, and Gruner (1998)	Role of marketing organization across different business context	Field research of 72 managers in U.S. and German firms	Contingency theory	Marketing organization	<ul style="list-style-type: none"> • Formalization • Centralization • Cross-functional dispersion 	Causative relationship between structure and marketing mix	Cross-functional dispersion of marketing activities will be higher for firms emphasizing differentiation-based strategies such as advertising.
Relationship between R&D and Organizational Structure							
Argyres and Silverman (2004)	Centralization vs. decentralization in R&D organization	71 large and mostly diversified firms	Transaction cost theory	R&D organization	<ul style="list-style-type: none"> • Multidivisional structure • Centralization 	Moderating relationship between structure and marketing mix	By reducing the internal transaction costs associated with R&D coordination across units, centralized R&D will generate innovations that have a larger and broader impact on subsequent technological evolution than will decentralized R&D activity.
Griffin and Hauser (1996)	Literature review of R&D and marketing organization	Theoretical discussion	Summary of various theories	Firm	<ul style="list-style-type: none"> • Functional structure • Coordinating groups • Matrix organizations • Project teams 	Causative relationship between structure and marketing mix	Formalization, decentralization, and value cooperation enhances cooperation between marketing and R&D whereas functional organization does not enhance cooperation in the firm.
Miller (1988)	Relationships of Porter's business strategies to the organizational structures and environments	Survey of 89 undiversified firms	Contingency theory	Firm	<ul style="list-style-type: none"> • Use of liaison devices, technocrats, and delegation. 	Causative relationship between structure and marketing mix	Spending on R&D (or innovative differentiation strategy) will be positively associated with the use of liaison devices, technocrats, and delegation.
Vorhies (1998)	Factors leading to the development of marketing capabilities and organizational effectiveness	Survey of chief marketing executive from 374 companies	Contingency theory	Firm	<ul style="list-style-type: none"> • Formalization • Centralization 	Causative relationship between structure and marketing mix	The development of more formal and centralized organizational structures will be negatively related to the development of marketing capabilities which includes advertising activities and new product/service development.

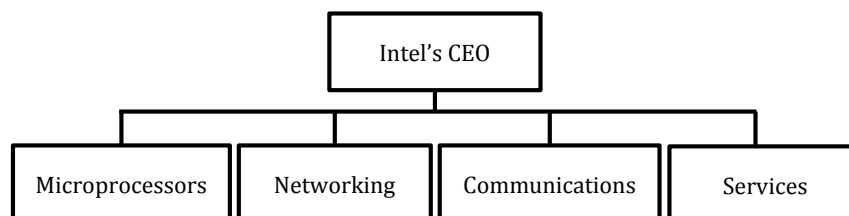
Note: Bureaucratic dimensions of organizational structure, such as centralization and formalization, refers to policies and activities occurring within the organizational that prescribe or restrict the behavior of organization members. Physical dimensions of organizational structure such as size, span of control, and flat/tall hierarchy, do not describe or limit the behavior of role incumbents in organizations (Workman, Homburg, and Gruner 1998).

TABLE 3
Key Characteristics of Structural Sources of Customer Centricity

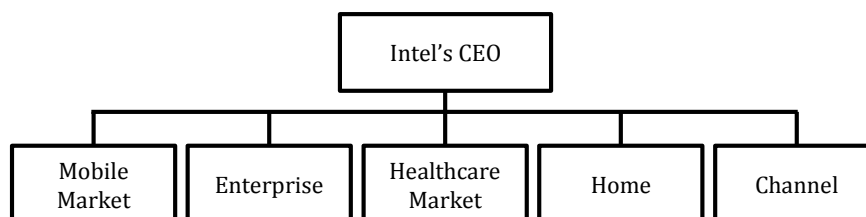
	Customer-Centric Structure	Size-Based Centricity	Scope-Based Centricity
Definition	Whether a firm's primary organizational structure immediately below the level of the CEO are organized around customer groups, instead of product groups	The extent to which a firm's primary organizational structure is divided into small divisions or business units	The extent to which a firm's structural divisions operate within a limited set of end markets
Structural design mechanism	Organizing around customer groups	Reducing division size	Reducing diversity of customers being served
Centricity benefits	<ul style="list-style-type: none"> • A shared within unit focus on customers • Easier customer communication (e.g., single point of contact) • Clear accountability for managing customer relationships 	<ul style="list-style-type: none"> • Each unit concentrates on particular businesses • Increased speed of decision making for customers • Frequent and informal interactions among all members 	<ul style="list-style-type: none"> • Well-situated to sense specific market segments' needs • Quick response to its core customers' changing needs • Increased managers' involvement in strategic marketing decisions
Centricity costs	<ul style="list-style-type: none"> • Duplication of infrastructure • Complex internal coordinating mechanisms • No restriction on the external customers being served 	<ul style="list-style-type: none"> • Creation of functional redundancies • Reduced internal communication complexity • Restriction on the external customers being served at the unit level 	<ul style="list-style-type: none"> • Decreased functional duplication costs • Reduced coordination complexity and conflict • Opportunity costs of sacrificing potential growth in other markets
Business examples	<p>Humana Inc. realigned "business into two segments, Commercial and Government ... to better reflect our focus on the consumer" (Humana Inc. 2002, p. 2).</p> <p>Dell Computer Corp. "restructured into four customer groupings [to] give top managers more responsibility and more flexibility to respond to clients" (<i>BusinessWeek</i> 2009, p. 39).</p>	<p>3M announced splitting its largest unit into three separate businesses to "realign its organization for ... a closer focus on markets and customers" (3M Co. 2003, p. 6).</p> <p>Microsoft tries "to keep their applications businesses at or below 200 people so that managers can develop an in-depth understanding of their business and motivate people" (Eisenhardt and Brown 1999, p. 77).</p>	<p>Intel Corporation divested a "Web hosting" business, increasing its business focus, to reduce the diversity of customer problems and activities that it needed to address (Vance and Weiss 2002, p. 8).</p> <p>Patagonia "dropped retailers and reduced its product offerings... [to] refocus on its core [business]" (<i>BusinessWeek</i> 1998, p. 68).</p>
Illustrative references	Day 2006; Gulati 2007; Homburg, Workman, and Jensen 2000; Shah et al. 2006	Brickley and Van Druen 1990; Child and McGrath 2001; Mintzberg 1983; Walker and Ruekert 1987	Hoskisson, Johnson, and Moesel 1994; Markides 1992; Varadarajan, Jayachandran, and White 2001

FIGURE 2
Comparison between Customer- and Product-Centric Structure: Example of Intel

A: Product-Centric Structure (Before a Customer-Centric Restructuring in 2005)



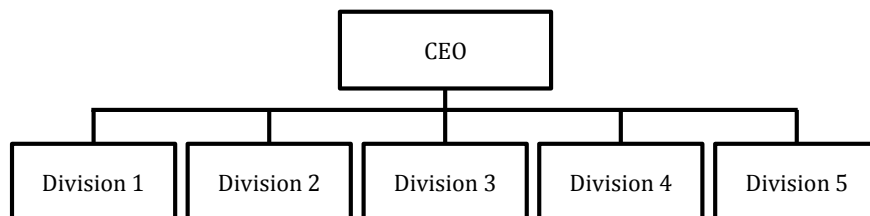
B: Customer-Centric Structure (After a Customer-Centric Restructuring in 2005)



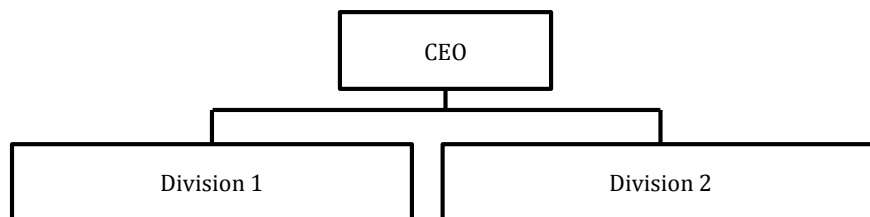
Notes: Although it is not unusual to find various structures at different layers of organization, this paper focuses on the organizational structure at the top management level.

FIGURE 3
Comparison between High and Low Size-Based Centricity

A: High Size-Based Centricity



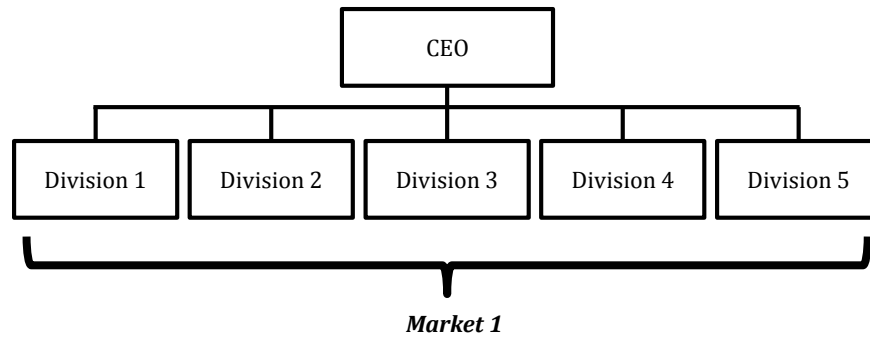
B: Low Size-Based Centricity



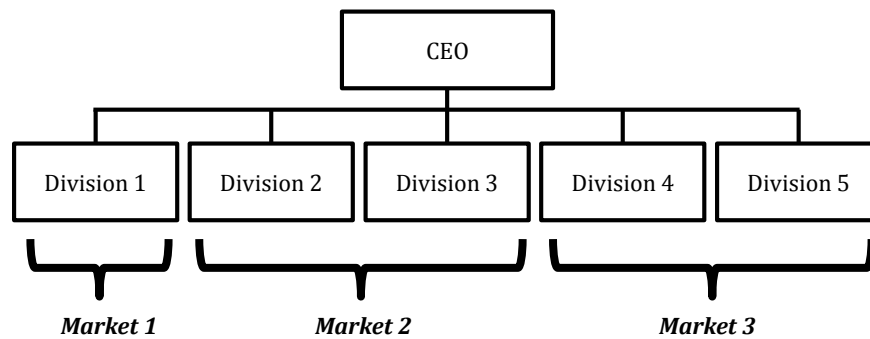
Notes: Size-based centricity is defined as the extent to which a firm divides itself into small structural units.

FIGURE 4
Comparison between High and Low Scope-Based Centricity

A: High Scope-Based Centricity



B: Low Scope-Based Centricity



Notes: Scope-based centricity is defined as the extent to which a firm competes within a limited set of end markets.

III. Conceptual Model and Hypotheses

1. Marketing Mix and Structural Sources of Customer Centricity: Contingency Theory and Configuration Theory Approach

To investigate the mechanisms through which the interaction effects between marketing mix and structural sources of customer centricity influence brand equity, I apply configuration and contingency theories. As Figure 1 depicts, structural sources of customer centricity should moderate the effects of marketing mix investments on firm performance through two key brand equity components: brand awareness and brand quality. Specifically, a firm can increase its brand awareness by spending more on advertising, and increase its brand quality by spending more on advertising or R&D. Extant research posits that assessing the effects of a firm's marketing mix on its performance requires the simultaneous consideration of multiple characteristics of the business (e.g., Vorhies and Morgan 2003). Thus, I propose that a firm's structural sources of customer centricity (i.e., customer-centric structure, size-based centricity, and scope-based centricity) moderate the rewards for advertising and R&D investments.

Configuration theory asserts that any one structural design characteristic and firm strategy will often fail to predict firm performance, but rather the "fit" or "congruence" among "multiple characteristics of the business" determines their impacts on performance (Miller 1996; Vorhies and Morgan 2003, p. 101). Similarly, contingency theory argues that the performance implication of a firm's structure depends on the firm's strategy and business context (Donaldson 2001; Drazin and Van de Ven 1985). Offering credence to these theories, for example, marketing studies find that organizations that match structural designs to business strategies enjoy superior performance (Olson, Slater, and Hult 2005; Vorhies and Morgan 2003). As such, I do not hypothesize the main effects of marketing mix, but primarily focus on understanding the effects

of the interactions between strategic marketing-mix investment and organizational structure on brand equity and resultant performance.

2. Effect of Advertising on Brand Awareness Moderated by Structural Sources of Customer Centricity

A firm with higher advertising expenditure has greater brand awareness by drawing consumers' attentions (Campbell and Keller 2003; Johnson and Russo 1984) and by strengthening their memory traces (Aaker 1991; Percy and Rossiter 1992). Understanding how advertising affects brand awareness is essential, but its ultimate influence on performance will also rest on the extent to which a firm matches advertising with organizational structure that fully exploits their advantages (Miller 1988). Thus, the key goal of this study is to analyze the conditions under which this link is particularly pronounced.

I propose that structural sources of customer centricity that a firm adopts may have a significant implication for the extent to which a firm can convert its advertising expenditure into actual brand awareness. By spending more on advertising, a firm can improve the extent to which consumers are familiar with and recognize the brands; translating these strengths into greater brand awareness is subject to *how efficiently a firm reinforces repetitive advertising exposure and increases visibility to broader consumers* for a given advertising expenditure. Higher level of advertising spending to support a customer's learning process is of little value when a firm's structure does not allow advertising functions to utilize its resources more efficiently. Thus, I consider that the moderating effects of (1) a firm's customer-centric structure, which precludes a firm from minimizing complexities in executing advertising, (2) size-based centricity, which undermines the opportunity to enjoy economies of scale, and (3) scope-based centricity, which sacrifices a firm's potential growth in other markets.

Moderating effect of a customer-centric structure on advertising–brand awareness

relationship. I expect that investment in advertising will have a less positive impact on brand awareness for a customer-centric structure than for a product-centric structure. Each customer-dedicated division delivers different versions of a similar product in a customer-centric structure (Gulati 2007), so managers cannot rely on economics of scale by duplicating the same advertising across all customer groups when producing and distributing advertising and marketing messages for a similar product. In contrast, in a product-centric firm, each product division deals with its own production of content, printing, distribution, and advertising space purchase (Ruekert, Walker, and Roering 1985), which creates higher visibility and familiarity from a large scale repeated exposure. For example, before shifting from a product-centric structure, Intel “has built one-size-fits-all processors, then expected customers to adopt them in various markets” (*BusinessWeek* 2005a). Consequently, for a given advertising dollar, managers can get more media space and create more consistent message, which increases the visibility of the brand and enhances brand recognition. Yet, after being a customer-centric firm, advertising budget for the same product needs to be redistributed across different customer groups, which precludes a firm from efficiently buying media spaces and from subsequently reaching to broader audiences. As consumers are less likely to be exposed to a firm’s advertising and to learn brand attributes, the effect of advertising on brand awareness is weakened in a customer-centric structure.

H₁: The interaction between advertising investments and customer-centric structure decreases brand awareness.

Moderating effect of size-based centrality on advertising–brand awareness relationship. All else being equal, a firm that divides its structure into many smaller divisions (high size-based centrality) sacrifices the economies of scale, so I argue that a firm’s investment in advertising has

a less positive impact on brand awareness as the level of size-based centricity increases.

Consider the effect of advertising on brand awareness for two otherwise identical firms with different levels of size-based centricity: one with two \$500 million divisions (low size-based centricity) and one with ten \$100 million divisions (high size-based centricity). In the former, advertising activities can be managed in a simpler and more integrated division where each division shares common advertising where products have some compatibility and use common advertising distribution channel. As the size of the division becomes greater, firms have more scale economies in purchasing the media space and in distributing to broader consumers.

Alternatively, in the firm with many smaller, \$100 million divisions, resource competition among divisions becomes more intense, so it is more difficult to share media spaces and to coordinate the distribution channel of advertising. As a result, each division duplicates the same activities or resources, reducing the visibility of brand for a given advertising dollar. Accordingly, advertising spending in smaller (larger) divisions to have a less positive (greater) impact on brand awareness. I expect that the effect of advertising on brand awareness is less positive for a firm with high size-based centricity than for a firm with low size-based centricity.

H₂: The interaction between advertising investments and size-based centricity decreases brand awareness.

Moderating effect of scope-based centricity on advertising–brand awareness relationship.

Firms with narrowly targeted end markets (high scope-based centricity) is more likely to sacrifice its opportunity to serve other markets, all else being equal, than are firms with a wider and various business operations (low scope-based centricity). Consider in this case the effect of advertising on brand awareness by two otherwise identical firms, each with five business divisions, that exhibit different levels of scope-based centricity: one that operates broadly in the medical market (low scope-based centricity) and another that operates only in the cardiac-care

market (high scope-based centrality). In the broadly focused firm, employees in each of the five divisions can deal with a wide range of medical issues, and customers must interact with multiple divisions, resulting in delivering advertising message to broader range of customers, and ultimately greater brand awareness. In contrast, in the firm that operates in just the cardiac-care market though, the five divisions are likely to have overlapping advertising, which precludes a firm from having potential opportunities to increase exposure to other markets. Thus, the effect of advertising on brand awareness weakens as a firm has higher level of scope-based centrality.

H₃: The interaction between advertising investments and scope-based centrality decreases brand awareness.

3. Effect of Advertising on Perceived Brand Quality Moderated by Structural Sources of Customer Centricity

Studies have shown that there are two major ways how greater advertising expenditure increases perceptions of brand quality. First, advertising affects target audiences' attitude toward a brand by providing specific reasons to buy and emphasizing key brand attributes different from competitors' (Rossiter and Percy 1997). As advertising emphasizes customer benefits that provide a specific reason to buy and use the brand, it stimulates customers to have positive feelings that get transferred to the brand (Aaker 1991). Second, high level of advertising volume serves as a signal of product quality because it implies managerial confidence in products and brands, and a firm's commitment to the brands. As a firm spends advertising dollars up front, such investment will be lost if the product does not meet a certain quality or expectation (Kirmani 1990; Kirmani and Wright 1989). Thus, consistent with signaling theory, increasing the level of advertising expenditure may readily lead to greater brand quality (Milgrom and Roberts 1986; Nelson 1974).

To enhance the advertising effectiveness on brand quality, it is critical to opt for market

segments that will lead to making a greater purchase behavior (Park, Jaworski, and MacInnis 1986). As advertising contains more narrowly focused claims, consumers are more likely to value a firm's effort on and commitment to the product, and to increase favorable attitudes. That is, translating a firm's advertising efforts into greater brand quality is subject to *how effectively a firm signals its effort on and commitment to the brand*. Specifically, customer centricity helps firms capture intimate customer knowledge, provide quick responses to customers' changing needs, and create a committed division of customer-focused employees, which lead to critical marketing capabilities and help the firm position itself uniquely in the market (Porter 1985). As a result, organizational structure that allows a firm's advertising activities to better deliver customers' value propositions and to better target niche segments will lead a firm to exhibit greater positive advertising effect on brand attitude and perceived brand quality.

Moderating effect of a customer-centric structure on advertising–perceived brand quality relationship. A customer-centric structure allows employees to better identify trends, unique needs, and common problems (Day 2006; Gulati 2009), so its advertising campaign can communicate well with consumers that the products or brands are of greater value to them than those provided by its competitors. By closely aligning with customer groups, firms can manage brand-supporting functions within each customer-focused division (Berthon, Hulbert, and Pitt 1999), which allows each of them to stress specific attributes that will match their own target markets' needs. As internal divisions are aligned with external customers through heterogeneous advertising, customer-centric firms can better signal their confidence in the brand and products, which facilitates the effect of advertising on the brand quality than their product-centric counterparts. For example, when Intel switched to a customer-centric structure, “engineers and marketing people joined forces to create advertising that would persuade consumers to pay a

premium for Centrino-powered notebooks” (*BusinessWeek* 2005a), so the advertising message was better focused on the specific customers and its value proposition was more persuasive.

Accordingly, it is more likely to persuade consumers that it is of better quality.

In contrast, firms organized around product groups are less likely to identify and quickly act on customer- or market-specific changes since each employee deals with many diverse customers/markets (Day 2006; Rust, Moorman, and Bhalla 2010), which makes it difficult to emphasize product attributes targeted for a single customer group (Aaker and Joachimsthaler 2000). For example, in a product-centric firm, multiple divisions might be able to position advertising into particular product markets, but often creates confusion for customers and undermines relationship-building efforts through marketing communication. Collectively, I predict that a customer-centric structure better leverages the effect of advertising on the brand quality than a product-centric structure does. Therefore,

H₄: The interaction between advertising investments and customer-centric structure increases perceived brand quality.

Moderating effect of size-based centrality on advertising–perceived brand quality

relationship. Firms that divide their business into many smaller divisions (higher size-based centrality) can better focus on end-customers and identify and adapt to customer trends rapidly, and advertising should have greater impact on brand quality. In a firm with low size-based centrality, employees likely encounter a wide variety of customers’ problems and design diverse advertising messages, so they cannot commit to any one customer group, nor can they identify and adapt to customer trends quickly, so ultimately, lower brand quality should result. In contrast, in a firm with many smaller divisions, employees in each division are responsible for and committed to a specific customer group with similar needs and problems, so they are less likely to deal with diverse advertising strategies. As those employees can quickly develop identification

and adaptation skills that may be used for designing advertising, consumers can better perceive a firm's confidence in products and brand. Therefore, I expect that the effect of advertising for a firm with smaller, relatively diverse divisions will have a greater impact on brand quality, because each division is better aligned with customers.

H₅: The interaction between advertising investments and size-based centrality increases perceived brand quality.

Moderating effect of scope-based centrality on advertising–perceived brand quality relationship. A firm with higher scope-based centrality can reduce the breadth of a firm's overall served markets (i.e., less customer diversity), which provides centrality benefits, and allow this firm to inherently align with its narrow customer base. Consider in this case the effect of advertising by two otherwise identical firms, each with five business divisions, that exhibit different levels of scope-based centrality: one that operates broadly in the electronic equipment market (low scope-based centrality) and another that operates only in the semiconductor market (high scope-based centrality). In a firm with a broad scope (low scope-based centrality), employees in each of the five divisions must deal with a wide range of electronic components issues, and customers must interact with multiple divisions and perceive different advertising messages. Consequently, a firm with low scope-based centrality cannot deploy value proposition different for specific customers by understanding their needs.

In contrast, in the firm that operates in just the semiconductor market though, the five divisions are well aligned to its narrow medical domain, which likely grants deep end-market knowledge and expertise to employees. Because this firm already is well situated to sense customers' needs and enable more targeted advertising, increasing advertising expenditure provides more improvement in brand quality compared with the broadly focused firm. For example, when a firm spends on advertising to inform consumers of its semiconductor

equipment, all divisions can contribute to provide better ways to present customer value proposition. Thus, I expect that advertising spending increases more brand quality for a firm with higher scope-based centrality.

H₆: The interaction between advertising investments and scope-based centrality increases perceived brand quality.

4. Effect of R&D on Perceived Brand Quality Moderated by Structural Sources of Customer Centrality

Firms that spend more on R&D expenditure exhibit a greater brand quality (Ailawadi, Lehmann, and Neslin 2003; Peterson and Jeong 2010). In particular, a larger amount of R&D expenditure helps firms pursue a product differentiation that allows them to specialize in product technologies or market segments (Christensen 1997; Porter 1985). Because such strategy provides more technical knowledge resources to explore novel ideas in the market, their products can incorporate a substantially different core technology, provide higher customer benefits relative to previous products in the industry, and win a reputation for innovation, which enhances credibility (Aaker 2004). Moreover, firms that consistently invest in R&D are more likely to send personnel for advanced technical training, access prior knowledge from experience, and better able to learn externally available scientific information (Zahra and George 2002). Overall, increased R&D expenditure generally leads customers to perceive the brand to be superior on relevant product attributes.

Yet, some studies show that spending more on R&D does not always result in superior brand quality. Aaker (2004, p. 8) notes that “R&D spending and a host of patents that do not result in branded products and services will not enhance the brand. Innovation needs to be relevant and visible”. For example, researchers have found that firms are more likely to stay innovative and to produce high quality products when they set up autonomous divisions within their structures

(Christensen 1997). Specifically, translating a firm's R&D efforts into greater brand equity is subject to *how effectively a firm develops products that address a customer's unmet needs*. In other words, the effect of R&D on the brand quality can be enhanced when each division in the organization has in-depth understanding of latent needs of current and new customers because such structure provides firms with ideas about unique ways to develop new product insights and deliver differentiated value to specific customers (Selden and MacMillan 2006).

Moderating effect of customer-centric structure on R&D–perceived brand quality relationship. In a customer-centric structure, customer-specific knowledge and commitment that help firms uncover and quickly address unmet customer needs become more common. As each division can better position themselves for responding to customer needs, their R&D activities can better identify customers' latent needs and develop products that can improve customers' experience. As all employees from different functional areas (e.g., engineer, marketers, sales) are more committed to identifying trends or understanding unique needs of target customer segments (Jayachandran et al. 2005; Reinartz, Krafft, and Hoyer 2004), engineers in R&D lab can better incorporate new product ideas from distant technology that resides outside of the firm but inside of the customers (Selden and MacMillan 2006). In addition, customer-centric firms are more likely to “engage in aggressive product development” (Baker and Sinkula 1999, p. 416), which make their R&D investment be allocated in a project for path-breaking products. Thus, R&D will be more likely to increase the innovation quality when a firm is organized by customers.

Conversely, in a product-centric structure, employees are less likely to share customer information which is necessary to develop new products that reflect market trends because decision-making authorities and knowledge are concentrated in the internal functions. As the product or brand they develop becomes less relevant to consumer's needs, they perceive the

brand less innovative or less valuable. As a result, R&D investments will be less likely to increase brand quality for product-centric firms. Thus, I expect that a customer-centric structure enhances the effect of R&D on brand quality.

H₇: The interaction between R&D investments and a customer-centric structure increases perceived brand quality.

Moderating effect of size-based centrality on R&D–perceived brand quality relationship.

Researchers note that managers and engineers in granular multidivisional firms are close to the customers, and that disaggregating a firm into smaller structural divisions allows each division to better sense the market and quickly identify changing customers' needs (Kay 1988). When a firm has smaller divisions, it tends to focus more on market-specific innovations than a firm with larger divisions (Leiponen and Helfat 2011). Because firms with smaller divisions (high size-based centrality) receive valuable ideas for innovation from their customers, each unit can immediately combine customers' needs in R&D decision or product development process, persuading consumers that its product or brand is of better quality.

In contrast, in a firm with larger divisions, it becomes more difficult for each division to capture intimate customer knowledge, provide quick responses to customers' changing needs, or create a committed division of customer-focused employees. As their R&D dollars fail to be commensurate with their differentiated position in customers' minds, consumers are less inclined to perceive that a firm's brand is significantly better or different from competitors' brand. Consequently, a firm's R&D effort often goes in vain to generate higher brand quality when a firm's divisions are large and few. Therefore, I expect that R&D will generate more brand quality for a high size-based centrality firm than for a low size-based centrality.

H₈: The interaction between R&D investments and size-based centrality increases perceived brand quality.

Moderating effect of scope-based centrality on R&D–perceived brand quality relationship.

Narrowing the scope of the business allows a firm to concentrate information into a few market segments and increase institutional knowledge, which leads to synergies in both resources and information (Hoskisson, Johnson, and Moesel 1994). As firms compete in a limited set of end markets, they are inherently more aligned with their customers, and develop more innovative customer-focused products. As a result, in a firm with high scope-based centrality, its R&D investment will have better opportunity to improve brand quality.

In contrast, when a firm competes in a diverse market, employees need to interact with customers from various markets, which preclude them from uncovering, adapting to, and fulfilling their service customers' unique and ever-evolving needs. When such firms invest in R&D, products will be less likely to be relevant to customers' needs, so consumers cannot easily perceive the value in them. As such, I expect that R&D will generate more brand quality for a high scope-based centrality firm than for a low scope -based centrality.

H₉: The interaction between R&D investments and scope-based centrality increases perceived brand quality.

5. Effect of Brand Awareness on Perceived Brand Quality

Marketing scholars suggest that consumers' awareness of the brand increases perceived brand quality (Buil, Chernatony, and Martínez 2013; Yoo, Donthu, and Lee 2000). Specifically, repeated advertising and resultant increased brand awareness can enhance consumers' perceptions of brand quality and preferences (D'Souza and Rao 1995; Keller 1987). For example, Aaker (1996, p. 114) notes that "Awareness can affect perceptions and attitudes. It can make peanut butter taste better". Also, higher awareness reduces consumer's information costs for the brand. Higher brand awareness often indicates that a firm is committed to the brand and able to afford high-level investment in brand awareness, so consumers often view that the products are

of certain level of quality (Erdem, Swait, and Valenzuela 2006; Kirmani and Rao 2000).

In addition, brand awareness reduces consumer's perceived risks or uncertainties associated with purchase decisions (Homburg, Klarmann, and Schmitt 2010). High level of brand awareness often implies that the brand is widely distributed and purchased by many other consumers, which signals suppliers' confidence and commitment to the buyers (Aaker 1991). As such, consumers generally assume that the well-known brand they will purchase will perform well, and evaluate the brand more favorably. Therefore, consistent with extant research, I expect that brand awareness positively influences brand quality.

H₁₀: Brand awareness has a positive effect on perceived brand quality.

6. Effects of Brand Awareness and Perceived Brand Quality on Firm Performance

In marketing literature, brand equity has a significant explanatory power for firm performance changes (Mizik and Jacobson 2009). For example, prior research shows that brand equity increases revenue premium (Ailawadi, Lehmann, and Neslin 2003), market share, and price premium (Park and Srinivasan 1994) but decreases total, systematic, and unsystematic equity risk (Rego, Billett, and Morgan 2009). Specifically, brand awareness is a dominant factor in both initial and repeat purchase situations (Hoyer and Brown 1990), which in turn increases customer loyalty, new customer acquisition, market share, and firm growth, and return on sales (Homburg, Klarmann, and Schmitt 2010). Also, higher brand quality results in increased stock return (Aaker and Jacobson 1994), increased profits (Balachander and Stock 2009), and decreased idiosyncratic risk (Bharadwaj, Tuli, and Bonfrer 2011). Therefore,

H₁₁: Brand awareness has a positive effect on firm performance.

H₁₂: Perceived brand quality has a positive effect on firm performance.

IV. Research Methodology

1. Data Description

To empirically test the proposed framework, I obtained data from multiple archival sources, including the Harris Interactive's EquiTrend database, COMPUSTAT Industrial Annual database, COMPUSTAT Business Segments database, and the annual and quarterly financial reports (i.e., Form 10-Ks, 10-Qs) that firms file with the Securities and Exchange Commission. I used Harris Interactive's database as my sampling frame for three reasons. First, Harris Interactive assesses components of brand equity with a firm's products and services, and these data are needed to operationalize brand awareness and perceived brand quality. Second, Harris Interactive covers a large portion of publicly-traded firms, which enables me to collect other finance and accounting data from secondary sources. Third, Harris Interactive database has been widely used in academic research as it provides longitudinal data sets for brand equity (Bharadwaj, Tuli, and Bonfrer 2011; Rego, Billett, and Morgan 2009).

I collected the data over the 7-year period from 2005 to 2011 for empirical analyses, which allowed me to objectively measure organizational structural sources of customer centricity. Beginning in 1998, firms were required to disclose disaggregated information in their Form 10-Ks and Form 10-Qs about all business operating units that correspond to their internal structure (FASB 1997). After accounting for missing data, the final sample featured 1,025 observations, representing 255 firms across 7 years. To the best of my knowledge, this data set is the most comprehensive source of secondary data used in the context of organizational structure in marketing research. In Table 4, I describe the constructs, definitions, measures, and data sources. Also, in Figure 5, I provide the industry composition of the sample firms. Industries that accounted for less than 3% of the sample were grouped as "Others" (12%) (e.g. Chemicals,

Construction, Electrical Equipment, and Textiles).

2. *Measures and Operationalization*

Brand awareness and perceived brand quality. Harris Interactive collects annual data on brand equity by conducting an online survey of more than 20,000 U.S. consumers for over 1000 brands across 35 categories. The sample is designed to represent the U.S. population, and each consumer. Consistent with marketing literature (Bharadwaj, Tuli, and Bonfrer 2011; Keller 1993; Rego, Billett, and Morgan 2009), perceived brand quality is assessed by consumer ratings; each consumer is asked to rate the overall quality of a brand on an 11-point scale (0 = “unacceptable/poor,” 5 = “quite acceptable,” and 10 = “outstanding/extraordinary”). Brand awareness is measured as the percentage of respondents who can rate the perceived quality of a brand (Clark, Doraszelski, and Draganska 2009). These variables provide excellent indicators of consumers’ awareness of the brand and the strength of positive associations with the brand in their minds (perceived brand quality); awareness and perceived quality together are the major aspects from Keller’s (1993) conceptualization of brand equity.

Firm performance. Consistent with extant research (e.g., Krasnikov, Mishra, and Orozco 2009), I used return on assets (ROA) and Tobin’s q (TQ) as a measure of firm performance. First, ROA was calculated as a firm’s operating income before depreciation divided by its book value of total assets, using COMPUSTAT’s industrial annual data (Bharadwaj, Tuli, and Bonfrer 2011). The use of ROA is advantageous as it is comparable across firms and industries, and they are also publicly reported.

Second, with the COMPUSTAT Industrial Annual database I operationalized Tobin’s q, following Chung and Pruitt’s (1994) commonly adopted method: $TQ = (MVE + PS + DEBT) / TA$, where MVE is the closing prices of shares at the end of the financial year \times number of common

shares outstanding, PS is the liquidation value of outstanding preferred stock, $DEBT = (\text{current liabilities} - \text{current assets}) + (\text{book value of inventories}) + (\text{long-term debt})$, and TA is the book value of total assets. Tobin's q offers several advantages because it is forward looking, risk-adjusted, and less vulnerable to managerial manipulations (Anderson, Fornell, and Mazvancheryl 2004; Fang, Palmatier, and Steenkamp 2008).

Advertising and R&D. To capture a firm's carry-over effect of advertising investment, I measured advertising as the average of advertising expenditure (in millions of dollars) over three year period with an annual discount rate .60, and scaled by its total assets (i.e., advertising intensity) (e.g., Luo, Wieseke, and Homburg 2012). The effect of advertising spending on brand equity and performance persists beyond the year in which those expenses are incurred (Hirschey and Weygandt 1985; Srinivasan, Lilien, and Sridhar 2011). Advertising expenditures that firms undertake to boost current-period sales may carry over to influence future success. For example, by spending more on advertising a firm can create greater awareness for its currently offered product, thereby affecting immediate performance. Typically though, advertising may also have a long-term effect of generating strong brand value transferable to the next generation product.

Similarly to the operationalization of advertising activities, I measured R&D as the average of R&D expenditure (in millions of dollars) over five year period with an annual discount rate .15 (Hirschey and Weygandt 1985; Srinivasan, Lilien, and Sridhar 2011), and scaled by its total assets (i.e., R&D intensity). Investments in previous years had an impact on a firm's future success, but did not influence current market performance (Boulding, Lee, and Staelin 1994). Rather, investment in R&D results in an immediate and significant negative impact on short-term profitability because firms are not permitted to accrue the expected future cash flow that R&D investments are expected to generate (Dechow and Sloan 1991). In this respect, they capture an

R&D effort for which there is a considerable time lag between resources committed and their potential outcome. I subsequently test the robustness of my results to an alternative amortization period, and results are consistent. In Figure 6, I show how advertising and R&D vary across different industries.

Customer-centric structure. To measure a customer-centric structure, I evaluated each firm's structure as a dummy variable measured as 1 if a firm has a customer-centric structure and 0 if a firm has product-centric structure (Gulati 2007; Homburg, Workman, and Jensen 2000; Shah et al. 2006). I used unit operating segment information from their Form 10-Ks and 10-Qs, which offered two major advantages. First, 10-Ks and 10-Qs reported under the Statement of Financial Accounting Standards (SFAS) No. 131 standard provide accurate information of a firm's structure as stated: "the segments are evident from the structure of the enterprise's internal organization" (FASB 1997, p. 6). As segment information is "regularly reviewed by the enterprise's chief operating decision maker" (FASB 1997, p. 7), it reflects the existing internal structure at that time. Second, reported structure is transparent as it is less subject to "management's latitude" (Ettredge et al. 2005, p. 776).

Two researchers independently reviewed each firm's 10-K and 10-Q information and classified the structure (see Appendix for detailed coding procedures, types of decisions made, and examples). Disagreements occurred less than 4% of the time and were resolved through discussion. To account for hybrid structures, I reclassified product-geography hybrid structure to product structures, and customer-geography hybrid structure to customer-centric structure in the analyses if sales from geographical business divisions (i.e., international division) accounts for less than 50% of the firm's total sales. I did not include pure geographic structure firms in the analyses as it accounts for less than 10%.

Size-based centrality. Following prior research (Burch and Nanda 2003; Homburg, Workman, and Krohmer 1999), I used a Herfindahl index measure to operationalize size-based centrality, with the following form: $1 - \sum p_i^2$, where p_i is the ratio of sales revenue in the business segment i ($i = 1, 2, \dots$, number of business segment) to the total sales of the firm. It is noteworthy that I subtracted one from the Herfindahl index to measure the extent to which a firm's divisions are smaller and granular because the Herfindahl index is a proxy for concentration. Thus, if a firm has one division (or business segment), the firm's size-based centrality takes the lowest score possible, $p_i = 0$.

Scope-based centrality. Following finance and management literature (Amit and Livnat 1988; Desai and Jain 1999), I used a Herfindahl index type measure to operationalize scope-based centrality, with the following form: $\sum p_j^2$, where p_j is the ratio of total sales revenue in the same segment four-digit SIC industry group j ($j = 1, 2, \dots$, number of unique industry segments in which the firm operates) to the total sales of the firm. If the entire firm's operating segment sales refer to one four-digit SIC segment, the firm's scope-based centrality takes the highest score possible, $p_j = 1$.

Control variables. I included firm- and industry-level control variables, based on the data from the COMPUSTAT Industry Annual database. I controlled for firm size, which was measured as the log transformation of market value equity (Xie, Davidson III, and DaDalt 2003). To control for a firm's service ratio, I calculated the percentage of a firm's sales from service segments (Fang, Palmatier, and Steenkamp 2008). I also used gross margin, measured as the ratio of gross profit (sales revenue — cost of goods sold) to sales revenue, to control for a firm's efficiency in converting costly inputs into valuable outputs (Morgan and Rego 2006). Firms with greater advertising expenditures may enjoy a lower cost of debt (Singh, Faircloth, and

Nejadmalayeri 2005), so I controlled for financial leverage measured as the ratio of long-term debt to total assets (Rao, Agarwal, and Dahlhoff 2004). I included the rate of annual sales growth of a firm to control for firm growth (Morgan and Rego 2006). Moreover, to control for industry turbulence, I first calculated the standard deviation of sales in the firm's primary 4-digit SIC industry across the prior five years and then divide it by the mean value of industry sales for those years (Fang, Palmatier, and Steenkamp 2008). In Table 5, I provide the descriptive statistics and correlation matrix of all the variables included in the analysis.

3. Model Specification

To advance my investigation of the impacts of advertising and R&D on brand equity, moderated by structural sources of customer centricity, I sought a model formulation that includes firm-year fixed effects to absorb any variation owing to unobserved characteristics at the firm- and year-level. Following extant marketing research (e.g., Fang, Palmatier, and Grewal 2011; Mizik and Jacobson 2009), I specify a series of models with three dependent variables for a firm i in time period t as the following:

$$(1) BA_{it} = \alpha_{10} + \alpha_{11}AD_{it} + \alpha_{12}RD_{it} + \alpha_{13}AD_{it} \times CCS_{it} + \alpha_{14}AD_{it} \times SZC_{it} + \alpha_{15}AD_{it} \times SCC_{it} + \alpha_{16}CCS_{it} + \alpha_{17}SZC_{it} + \alpha_{18}SCC_{it} + \alpha_{19}Z_{it} + \sum_{t=2005}^{T-1} \alpha_1^t \text{Year Dummy} + \sum_{i=1}^{I-1} \alpha_1^i \text{Firm Dummy} + \varepsilon_{it}^{BA},$$

$$(2) BQ_{it} = \alpha_{20} + \alpha_{21}AD_{it} + \alpha_{22}RD_{it} + \alpha_{23}AD_{it} \times CCS_{it} + \alpha_{24}AD_{it} \times SZC_{it} + \alpha_{25}AD_{it} \times SCC_{it} + \alpha_{26}RD_{it} \times CCS_{it} + \alpha_{27}RD_{it} \times SZC_{it} + \alpha_{28}RD_{it} \times SCC_{it} + \alpha_{29}CCS_{it} + \alpha_{210}SZC_{it} + \alpha_{211}SCC_{it} + \alpha_{212}BA_{it} + \alpha_{213}Z_{it} + \sum_{t=2005}^{T-1} \alpha_2^t \text{Year Dummy} + \sum_{i=1}^{I-1} \alpha_3^i \text{Firm Dummy} + \varepsilon_{it}^{BQ}, \text{ and}$$

$$(3) PRF_{it} = \beta_0 + \beta_1 BA_{it-1} + \beta_2 BQ_{it-1} + \beta_3 RD_{it-1} + \beta_4 Z_{it-1} + \sum_{t=2005}^{T-1} \beta^t \text{Year Dummy} + \sum_{i=1}^{I-1} \beta^I \text{Firm Dummy} + \varepsilon_{it-1}^{PRF},$$

where BA is brand awareness; BQ is brand quality (i.e., perceived brand quality); and PRF is performance; AD denotes advertising intensity; RD is R&D intensity; CCS is customer-centric structure dummy; SZC is size-based centrality; SCC is scope-based centrality; \mathbf{Z} is a vector of control variables that include firm size, service ratio, gross margin, firm leverage, firm growth, and industry turbulence. To control for time-trends, I include a set of year dummies, which is captured by Year Dummy. Also, to control for time-invariant firm-specific effects, a set of Firm Dummy is used.

The interpretation of the parameters is as follows. In the first path (Equation 1), α_{10} denotes the intercept, and α_{11} and α_{12} capture the main effect of advertising and R&D on brand awareness, respectively. α_{13} , α_{14} , α_{15} represent the moderating effects of customer-centric structure, size-based centrality, and scope-based centrality, respectively, on the relationship between advertising and brand awareness. Furthermore, α_{16} , α_{17} , α_{18} represent the main effects of customer-centric structure, size-based centrality, and scope-based centrality, respectively. α_9 represents the parameter vector of control variables. Finally, α_1^t captures effects specific to the year, and α_1^f captures the time-invariant firm-specific effects on brand awareness.

In the second path (Equation 2), α_{20} denotes the intercept, and α_{21} and α_{22} capture the main effect of advertising and R&D on brand awareness, respectively. α_{23} , α_{24} , α_{25} represent the moderating effects of customer-centric structure, size-based centrality, and scope-based centrality, respectively, on the relationship between advertising and perceived brand quality. Also, α_{26} , α_{27} , α_{28} represent the moderating effects of customer-centric structure, size-based centrality, and scope-based centrality, respectively, on the relationship between R&D and perceived brand quality. Furthermore, α_{29} , α_{210} , α_{211} represent the main effects of customer-centric structure, size-based centrality, and scope-based centrality, respectively. α_{212} represents

the effect of brand awareness on perceived brand quality, α_{113} represents the parameter vector of control variables. Finally, α_2^t captures effects specific to the year, and α_2^I captures the effect of time-invariant firm-specific effects on brand quality.

Turning to the performance model (Equation 3), β_0 denotes the intercept, and β_1 and β_2 capture the main effect of brand awareness and perceived brand quality on performance, respectively. β_3 captures the direct effect of R&D on performance, and β_3 captures the parameter vector of control variables. Finally, β_2^t captures the year-specific effects, and β_2^I captures the effect of time-invariant firm-specific effects on firm performance.

The standard ordinary least squares (OLS) assumes that the error terms are independent and identically distributed (i.e., the diagonal terms in the covariance matrix is zero). Yet, when the error terms are heteroskedastic, the estimates from the standard OLS estimation are biased. To account for such inherent heteroskedasticity, I used a robust-cluster estimator of the standard errors with firm-level clustering. As a variant of the Huber–White robust estimator, this estimator provides correct standard errors in the presence of any pattern of heteroskedasticity by relaxing the assumption of independence of errors in the regressions and allowing for within-cluster correlation (Arellano 1987; Petersen 2009). That is, clustering by firm allows observations to be serially-correlated, but assumes independence across firms (Gow, Ormazabal, and Taylor 2010). It also remains valid and provides correct coverage in the presence of any pattern of correlation among errors within units as it will “correctly account for the dependence in the data common in a panel data set and produce unbiased estimates” (Petersen 2009, p. 443). As such, this estimator is robust to the presence of unmeasured firm-specific factors causing correlation among errors of observations for the same firm, or for that matter any other form of within-unit error correlation.

4. Estimation Results

I present the results of the estimation in Table 6. According to my theoretical framework, I have five tasks in empirically examining my hypotheses: (1) testing the interaction effects of advertising and structural sources of customer centricity on brand awareness (H_1, H_2, H_3); (2) testing the interaction effects of advertising and structural sources of customer centricity on perceived brand quality (H_4, H_5, H_6); (3) testing the interaction effects of R&D and structural sources of customer centricity on perceived brand quality (H_7, H_8, H_9); (4) testing the effect of brand awareness on perceived brand quality (H_{10}); and (5) testing the effects of brand quality and brand awareness on performance (H_{11}, H_{12}). While the baseline models (i.e., Model 1, Model 3) report only the main effects of advertising, R&D, structural sources of customer centricity, and control variables on brand awareness and perceived brand quality respectively, the full models (i.e., Model 2, Model 4, Model 5, and Model 6) test the hypotheses. In particular, Model 2 tests H_1 – H_3 , Model 4 tests H_4 – H_{10} , and Model 5 and Model 6 test H_{11} and H_{12} .

As shown in Model 2 of Table 5, H_1 is supported because a customer-centric structure significantly moderates the effect of advertising on brand awareness ($b = -1.232, p < .05$). In addition, H_2 , predicts that size-based centricity significantly moderates the effect of advertising on brand awareness; I find support for this claim because the interaction term is negative and marginally significant ($b = -.718, p < .10$). However, I do not find support for H_3 , the interaction between scope-based centricity and advertising is not significant ($b = -.620, n.s.$).

In Model 4 of Table 5, I do not find support for H_4 because a customer-centric structure does not moderate the effect of advertising on perceived brand quality ($b = 4.026, n.s.$), but I find strong support for H_5 that size-based centricity significantly moderates the effect of advertising on perceived brand quality ($b = 2.052, p < .05$). Moreover, in support of H_6 , scope-based

centricity significantly moderates the effect of advertising on perceived brand quality ($b = 8.531$, $p < .05$). The effect of R&D on perceived brand quality is positively moderated by a customer-centric structure ($b = 4.141$, $p < .05$), size-based centricity ($b = 6.579$, $p < .10$), and scope-based centricity ($b = 7.573$, $p < .05$) in support of H₇, H₈, H₉. I also find strong support for H₁₀ because brand awareness positively affects perceived brand quality ($b = 2.348$, $p < .01$).

Finally, as shown in Model 5, brand awareness ($b = .035$, $p < .05$) and perceived brand quality ($b = .006$, $p < .10$) significantly affect firm performance measured as ROA in support of H₁₁ and H₁₂. When Tobin's q is used as a proxy for firm performance, the results are consistent as shown Model 6. In sum, 10 of 12 hypotheses are supported, which gives me confidence in the theoretical framework.

5. *Sensitivity Analyses*

Alternative advertising and R&D. To enhance confidence in my findings, I tested the model with alternative measures of advertising and R&D. Instead of rescaling advertising and R&D expenditures by assets, I rescaled by a firm's total sales (McAlister, Srinivasan, and Kim 2007; Tuli, Mukherjee, and Dekimpe 2012). As Model 1, 2, 3, and 4 in Table 7 reveals, the results were similar to those obtained from the main model in Table 6. Overall, 8 of 12 effects are significant.

Alternative advertising and R&D window. I examined the robustness of the results to alternative measures of performance. I tried different windows and carry-over effects. That is, I computed advertising and R&D intensity as three- and five- years with amortization rates of .40 and .40, respectively, and the results were consistent. Moreover, I used different model specification where I used the lag of expenditures instead of carry-over factors. The results were very similar to the results in Table 6.

6. Instrumental Variable Approach

It can be argued that advertising and R&D investments reflect a firm's organizational design choices made by executives and managers, and that these choices may be based on the expectation that certain advertising and R&D strategy will increase a firm's brand awareness and perceived quality of brands. This argument suggests that an unobserved factor which is not in the model can generate a problem of endogeneity with regard to the variables in the model. To resolve this issue, I need to find a successful instrument that needs to be correlated with the explanatory variable but uncorrelated with the residual. Consistent with previous research (Lev and Sougiannis 1996), the industry average advertising (R&D) expenditures rescaled by industry total assets (i.e., advertising intensity) for each four-digit SIC industry in which a firm is based was used as the instrument. Industry average advertising and R&D investments are unaffected by a firm specific managerial strategy or idiosyncratic factors, thereby considerably limiting its correlation with the residual from the original regression. Moreover, the correlation between a given firm's advertising (R&D) and the industry advertising (R&D) average is generally high (i.e., high correlation between original variable and instrument), so the instrumental variable is relevant and valid.

To account for the endogeneity problem, I employed a two-stage least squares regression method (Greene 2000). The first stage tests had a firm's advertising (R&D) that I described in the measurement section as the dependent variable while other predictors are regressors (Baum 2006). For example, for regressions with a firm's advertising measure as the dependent variable, the predictors included a firm's R&D measure, firm size, service ratio, gross margin, firm leverage, firm growth, industry turbulence, and year and firm dummies. In addition, I included the industry advertising (R&D) expenditure scaled by total assets as instruments. I obtained new

variables by obtaining the fitted values of advertising from the first stage regression. The second stage had brand equity (i.e., brand awareness, perceived brand quality) as the dependent variable, and used the fitted values for each of the endogenous variables (a firm's advertising and R&D) and their interactions as regressors. As each equation included multiple endogenous variables, I used the newly estimated fitted values to replace the original endogenous variables (Baum 2006).

I performed Durbin–Wu–Hausman test for endogeneity (Davidson and MacKinnon 1993). If the null hypothesis that OLS estimates are consistent is rejected, endogeneity is present and the instrumental variable estimator is preferred. As the null hypothesis was not rejected in brand awareness equation ($\chi^2 = .401, n.s.$), and in brand quality equation ($\chi^2 = .447, n.s.$) I found no evidence that the results are driven by endogeneity (i.e., the estimates from the original regression is consistent).

7. Elasticity Analysis: Effects of Advertising and R&D on Performance

To understand the total net impacts of advertising and R&D on firm performance, I calculated performance elasticities of advertising and R&D at different levels of moderators (customer-centric structure, size-based centrality, scope-based centrality). My goal is to examine *when advertising and R&D pay off and by how much*. I decomposed the elasticity of firm performance to changes in advertising ($ELAS_{PRF,AD}$) and R&D ($ELAS_{PRF,RD}$), which indicates the percentage change in performance for a 1% change in advertising (or R&D). From the model specification in Equations 1–3, I express the two elasticities as:

$$(4) \quad ELAS_{PRF,AD} = \frac{\partial PRF/PRF}{\partial AD/AD} = [\beta_1(\alpha_{11} + \alpha_{13}CCS + \alpha_{14}SZC + \alpha_{15}SCC) + \beta_2\alpha_{212}(\alpha_{11} + \alpha_{13}CCS + \alpha_{14}SZC + \alpha_{15}SCC) + \beta_2(\alpha_{21} + \alpha_{23}CCS + \alpha_{24}SZC + \alpha_{25}SCC)] \cdot \frac{AD}{PRF}, \text{ and}$$

$$(5) \quad ELAS_{PRF,RD} = \frac{\partial PRF/PRF}{\partial RD/RD} = [\beta_1(\alpha_{12}) + \beta_1\alpha_{212}(\alpha_{12}) + \beta_2(\alpha_{22} + \alpha_{26}CCS + \alpha_{27}SZC +$$

$$\alpha_{28}SCC) + \beta_3] \cdot \frac{RD}{PRF}.$$

Using the parameter estimates in Table 6, I found that, on average, the advertising elasticity is .003, and R&D elasticity is .171, which is consistent with the previous findings (Sethuraman, Tellis, and Briesch 2011). In addition, I calculated advertising elasticity at different levels of three structural sources of customer centricity to examine the opposing moderating effects of structural sources in understanding the effect of advertising on brand awareness and perceived brand quality. Specifically, I performed additional analysis that can explain how much of the performance effect can be attributed to the different pathways. In particular, advertising elasticity (Equation 4) can be decomposed into three parts: (1) elasticity attributed to brand awareness path $[\beta_1(\alpha_{11} + \alpha_{13}CCS + \alpha_{14}SZC + \alpha_{15}SCC)]$, (2) elasticity attributed to brand awareness path which also goes through brand quality path $[\beta_2\alpha_{212}(\alpha_{11} + \alpha_{13}CCS + \alpha_{14}SZC + \alpha_{15}SCC)]$, and (3) elasticity attributed to brand quality path $[\beta_2(\alpha_{21} + \alpha_{23}CCS + \alpha_{24}SZC + \alpha_{25}SCC)]$.

I illustrate the results in Figure 7. When a firm adopts a customer-centric structure, the advertising–performance elasticity was lower than the elasticity in a product-centric structure by .01. Consistently, the advertising–performance elasticity of a firm with high size-based centricity (one standard deviation above) was lower by .004 than that of a firm with low (one standard deviation below) size-based centricity. However, the advertising–performance elasticity of a firm with high scope-based centricity (one standard deviation above) was greater by .002 than that of a firm with low (one standard deviation below) scope-based centricity because the brand quality path overwhelms the other two paths. Overall, I find that a customer-centric structure and size-based centricity decrease the performance returns of advertising whereas scope-based centricity increases the performance returns from advertising investment.

Moreover, I calculated R&D elasticity at different levels of three structural sources of

customer centricity. It should be noted that structural sources of customer centricity do not have contradictory moderating effects on the relationship between R&D and performance because the moderating impacts only exist in perceived brand quality equation. When a firm adopts a customer-centric structure, the R&D–performance elasticity was greater than the elasticity in a product-centric structure by .007. Consistently, the R&D–performance elasticity of a firm with high size-based centricity (one standard deviation above) was greater by .006 than that of a firm with low (one standard deviation below) size-based centricity. Also, the R&D–performance elasticity of a firm with high scope-based centricity (one standard deviation above) was greater by .005 than that of a firm with low (one standard deviation below) scope-based centricity. Overall, I find structural sources of customer centricity increases the performance returns of R&D.

TABLE 4
Constructs, Definitions, Measurements, and Data Sources

Constructs	Definitions	Measures (References)	Data Sources
Brand awareness	The extent to which customers are able to recognize and recall a firm's brands	Percentage of respondents who can rate the perceived quality of a brand (Clark, Doraszelski, and Draganska 2009).	Harris Interactive's EquiTrend database
Perceived brand quality	Consumers' perception on how well a brand meets their requirements and expectations	Consumer ratings of the overall quality of a brand on an 11-point scale (0 = "unacceptable/poor," 5 = "quite acceptable," and 10 = "outstanding/extraordinary") (Bharadwaj, Tuli, and Bonfrer 2011; Keller 1993; Rego, Billett, and Morgan 2009).	Harris Interactive's EquiTrend database
Firm performance	Overall level of firm performance	(1) Returns on Assets: A firm's operating income before depreciation divided by its book value of total assets (Bharadwaj, Tuli, and Bonfrer 2011). (2) Tobin's q (Chung and Pruitt 1994).	COMPUSTAT Annual Industrial Files
Advertising	Firm's investment on advertising activities	Average of advertising expenditure (in millions of dollars) over three year period with an annual discount rate .60, and scaled by its total assets (Hirschey and Weygandt 1985; Srinivasan, Lilien, and Sridhar 2011).	COMPUSTAT Annual Industrial Files
R&D	Firm's investment on R&D activities	Average of R&D expenditure (in millions of dollars) over five year period with an annual discount rate .15, and scaled by its total assets (Hirschey and Weygandt 1985; Srinivasan, Lilien, and Sridhar 2011).	COMPUSTAT Annual Industrial Files
Customer-centric structure	Whether a firm's primary organizational structure, immediately below the level of CEO, is organized around customer groups	Dummy variable measured as 1 if a firm has a customer-centric structure and 0 if a firm has a product-centric structure (Day 2006; Gulati 2007; Homburg, Workman, and Jensen 2000).	Form 10-Ks and 10-Qs under Statement of Financial Accounting Standards No. 131
Size-based centricity	The extent to which a firm's primary organizational structure is divided into small structural divisions or business units	Herfindahl index based on business segment. It is the sum of squares of total sales revenue within the same business segment to the total sales of the firm. I subtracted one from the Herfindahl index the Herfindahl index is a proxy for concentration (Burch and Nanda 2003; Homburg, Workman, and Krohmer 1999).	COMPUSTAT Business Segments
Scope-based centricity	The extent to which a firm's structural divisions operate within a limited set of end markets	Herfindahl index based on four-digit segment SIC code. It is the sum of squares of total sales revenue within the same segment four-digit SIC industry group to the total sales of the firm (Amit and Livnat 1988; Desai and Jain 1999).	COMPUSTAT Business Segments
Firm size	Size of the firm	Log transformation of market value equity (Xie, Davidson III, and DaDalt 2003).	COMPUSTAT Annual Industrial Files
Service ratio	Firm's share of sales revenue generated by services versus products	The percentage of sales revenues in all service business segments compared with the total sales revenue of each firm in a given year (Fang, Palmatier, and Steenkamp 2008).	COMPUSTAT Business Segments
Gross margin	Efficiency in converting costly inputs into valuable outputs	Ratio of gross profit (sales revenue – cost of goods sold) to sales revenue (Morgan and Rego 2006).	COMPUSTAT Annual Industrial Files
Firm leverage	Firm's cost of debt	Ratio of long-term debt to total assets (Rao, Agarwal, and Dahlhoff 2004).	COMPUSTAT Annual Industrial Files
Firm growth	Growth of the firm	Rate of annual sales growth of a firm (Morgan and Rego 2006).	COMPUSTAT Annual Industrial Files
Industry turbulence	The extent to which industry is dynamic	Standard deviation of sales in the firm's primary 4-digit SIC industry across the prior five years and then divide it by the mean value of industry sales for those years (Fang, Palmatier, and Steenkamp 2008).	COMPUSTAT Annual Industrial Files

TABLE 5
Description Statistics and Correlations

	Mean	Std Dev	Correlation															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1. Brand awareness	.589	.194	1															
2. Perceived brand quality	6.087	.909	.687	1														
3. Returns on assets (ROA)	.132	.105	.185	.198	1													
4. Tobin's q (TQ)	2.200	1.299	.017	.109	.567	1												
5. Advertising	.036	.058	.070	.072	.248	.283	1											
6. R&D	.016	.038	-.124	-.009	.068	.282	.022	1										
7. Customer-centric structure	.181	.385	-.054	-.024	-.029	-.008	-.064	.030	1									
8. Size-based centrality	.307	.288	.086	.107	-.079	-.136	-.109	.045	.252	1								
9. Scope-based centrality	.815	.241	-.132	-.157	.093	.133	.188	-.022	-.043	-.730	1							
10. Firm size	8.464	2.019	.136	.156	.200	.147	-.314	.205	.012	.231	-.268	1						
11. Service ratio	.539	.397	-.051	-.150	-.107	-.035	-.027	-.293	-.016	-.311	.320	-.115	1					
12. Gross margin	.406	.205	-.141	-.080	.322	.371	.238	.413	.047	-.091	.138	.117	-.132	1				
13. Firm leverage	.207	.203	.100	-.018	.111	-.151	.194	-.158	-.111	-.105	.130	-.247	.072	.051	1			
14. Firm growth	9.389	22.639	-.099	-.074	-.056	.173	-.037	.001	.034	-.096	.082	.037	.096	.074	-.033	1		
15. Industry turbulence	.129	.057	.141	.135	.017	.166	.138	-.026	.026	.103	-.074	-.043	.014	.053	-.040	.049	1	

Notes: $p < .05$ if $r > .06$.

TABLE 6
Estimation Results: Structural Sources of Customer Centricity for Leveraging the Effects of Marketing Mix on Brand Equity and Firm Performance

Constructs	Hypotheses (Directions)	Brand Awareness		Perceived Brand Quality		Performance	
		Model 1	Model 2	Model 3	Model 4	Model 5 (ROA)	Model 6 (TQ)
Interactions							
Advertising × customer-centric structure	H ₁ (-), H ₄ (+)		-1.232** (.746)		4.026 (3.287)		
Advertising × size-based centricity	H ₂ (-), H ₅ (+)		-0.718* (.554)		2.052** (1.006)		
Advertising × scope-based centricity	H ₃ (-), H ₆ (+)		-0.620 (.855)		8.531** (4.015)		
R&D × customer-centric structure	H ₇ (+)				4.141** (2.153)		
R&D × size-based centricity	H ₈ (+)				6.579* (4.965)		
R&D × scope-based centricity	H ₉ (+)				7.573** (3.721)		
Main Effects							
Advertising		.439* (.289)	1.183 (.940)	.057 (.880)	-8.387** (3.928)		
R&D		-0.379 (.329)	-0.374 (.324)	1.076 (2.668)	-7.662 (6.119)	.638*** (.191)	5.791* (3.702)
Main Effects of Structural Sources of Customer Centricity							
Customer-centric structure		.016 (.026)	.020 (.026)	-0.283** (.128)	-0.327** (.151)		
Size-based centricity		-0.065 (.057)	-0.034 (.049)	.083 (.125)	-0.077 (.168)		
Scope-based centricity		-0.086** (.045)	-0.059 (.048)	.153 (.167)	-0.192 (.206)		
Effects of Brand Equity							
Brand awareness	H ₁₀ (+), H ₁₁ (+)			2.335*** (.529)	2.348*** (.533)	.035** (.018)	.623** (.320)
Perceived brand quality	H ₁₂ (+)					.006* (.004)	.066 (.106)
Control Variables							
Firm size		-0.003 (.005)	-0.003 (.005)	.063 (.058)	.065 (.058)	.011** (.005)	.114** (.058)
Service ratio		-0.049 (.056)	-0.055 (.056)	-0.171 (.313)	-0.117 (.287)	.066* (.043)	-0.426 (.448)
Gross margin		-0.026 (.040)	-0.029 (.040)	.486** (.210)	.517*** (.192)	.139*** (.040)	.535 (.480)
Firm leverage		.069** (.037)	.067** (.037)	-0.053 (.195)	-0.027 (.194)	.015 (.051)	.060 (.501)
Firm growth		-0.000 (.000)	-0.000 (.000)	-0.001 (.001)	-0.000 (.001)	.000*** (.000)	.002** (.001)
Industry turbulence		.06 (.166)	.069 (.166)	-0.151 (.651)	-0.280 (.633)	.027 (.051)	1.045 (1.073)
Intercept		.712*** (.074)	.693*** (.074)	3.907*** (.659)	4.184*** (.668)	-.124** (.058)	.329 (.936)
Firm Fixed Effects		Included	Included	Included	Included	Included	Included
Year Fixed Effects		Included	Included	Included	Included	Included	Included
R²		.099	.104	.463	.470	.128	.187

* $p < .10$.

** $p < .05$.

*** $p < .01$.

Notes: The table reports parameter estimates with standard errors in parenthesis.

TABLE 7
Sensitivity Analysis: Alternative Measures of Advertising and R&D (Scaled by Sales)

Constructs	Hypotheses (Directions)	Brand Awareness		Perceived Brand Quality		Performance	
		Model 1		Model 2		Model 3 (ROA)	Model 4 (TQ)
Interactions							
Advertising × customer-centric structure	H ₁ (-), H ₄ (+)	-0.309	(1.138)	5.677*	(4.120)		
Advertising × size-based centrality	H ₂ (-), H ₅ (+)	-0.520*	(.389)	.917	(1.858)		
Advertising × scope-based centrality	H ₃ (-), H ₆ (+)	-0.337	(.828)	7.255**	(3.872)		
R&D × customer-centric structure	H ₇ (+)			3.980**	(2.356)		
R&D × size-based centrality	H ₈ (+)			3.990*	(2.944)		
R&D × scope-based centrality	H ₉ (+)			2.937	(3.760)		
Main Effects							
Advertising		.427	(.879)	-8.390**	(3.694)		
R&D		-0.325	(.318)	-5.604	(4.460)	.162	(.290)
							-7.077** (3.822)
Main Effects of Structural Sources of Customer Centricity							
Customer-centric structure		.018	(.027)	-0.354**	(.154)		
Size-based centrality		-0.044	(.057)	.019	(.164)		
Scope-based centrality		-0.063	(.050)	-0.085	(.199)		
Effects of Brand Equity							
Brand awareness	H ₁₀ (+), H ₁₁ (+)			2.330***	(.529)	.033**	(.018)
Perceived brand quality	H ₁₂ (+)					.007**	(.004)
							.588** (.317)
							.065 (.103)
Control Variables							
Firm size		-0.003	(.005)	.060	(.058)	.011**	(.005)
Service ratio		-0.056	(.053)	-0.169	(.283)	.055	(.044)
Gross margin		-0.018	(.039)	.557***	(.190)	.139***	(.040)
Firm leverage		.066**	(.038)	-0.084	(.194)	.012	(.051)
Firm growth		.000	(.000)	-0.000	(.001)	.000***	(.000)
Industry turbulence		.067	(.169)	-0.304	(.636)	.031	(.052)
							1.099 (1.091)
Intercept							
		.710***	(.079)	4.252***	(.677)	-.111**	(.055)
Firm Fixed Effects							
		Included		Included		Included	
Year Fixed Effects							
		Included		Included		Included	
R²							
		.096		.471		.117	.190

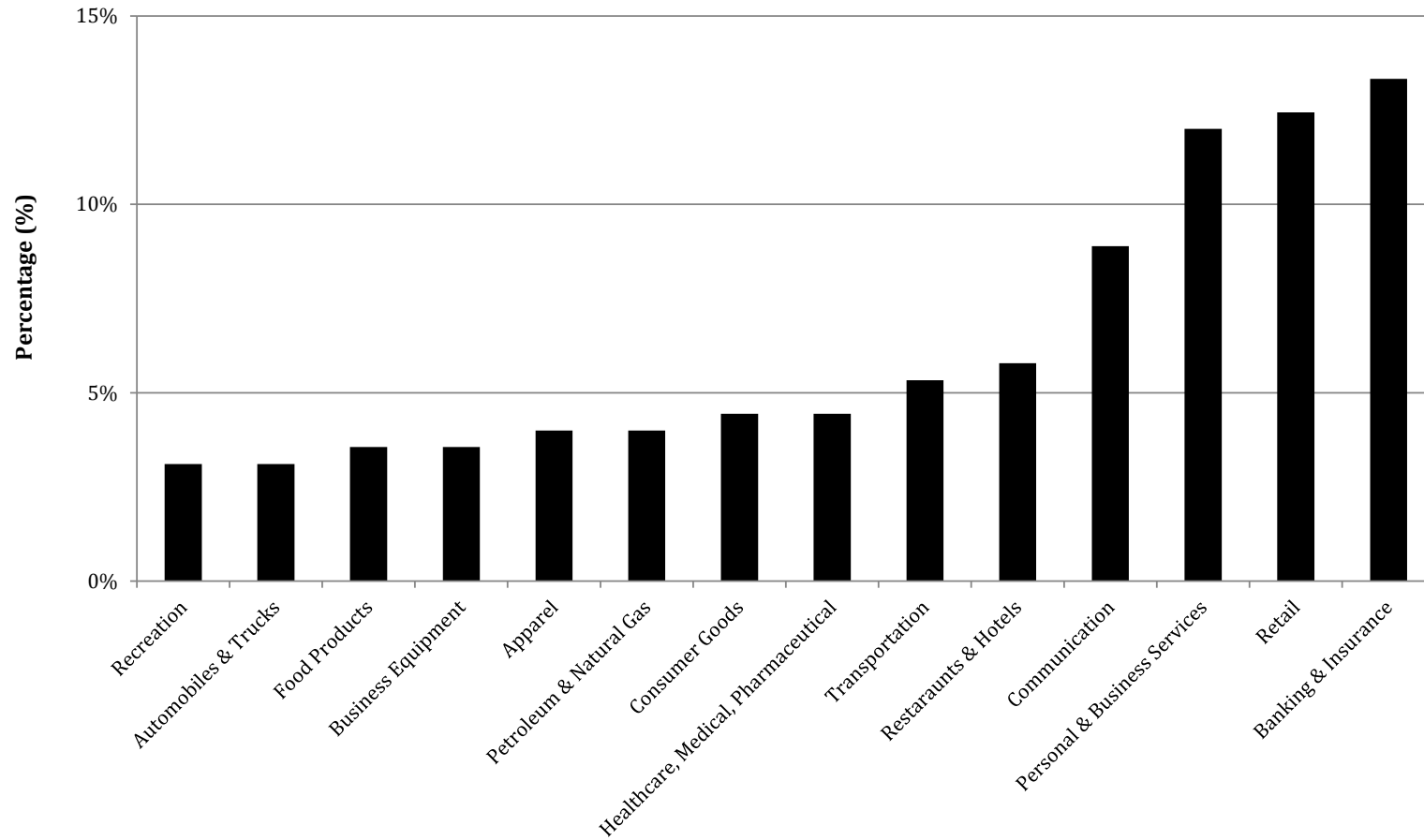
* $p < .10$.

** $p < .05$.

*** $p < .01$.

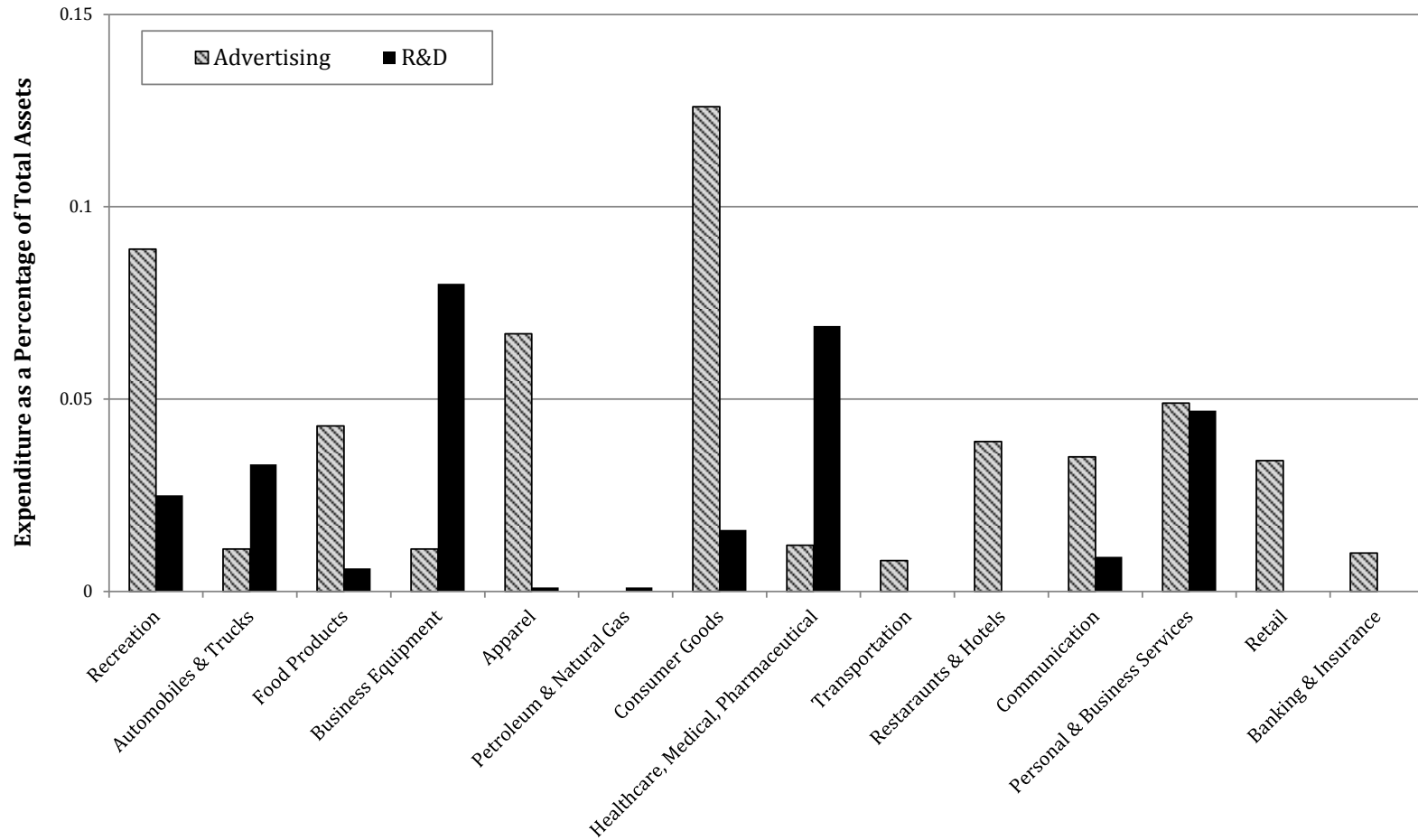
Notes: The table reports parameter estimates with standard errors in parenthesis.

FIGURE 5
Sample Description: Industry Composition of the Sample Firms



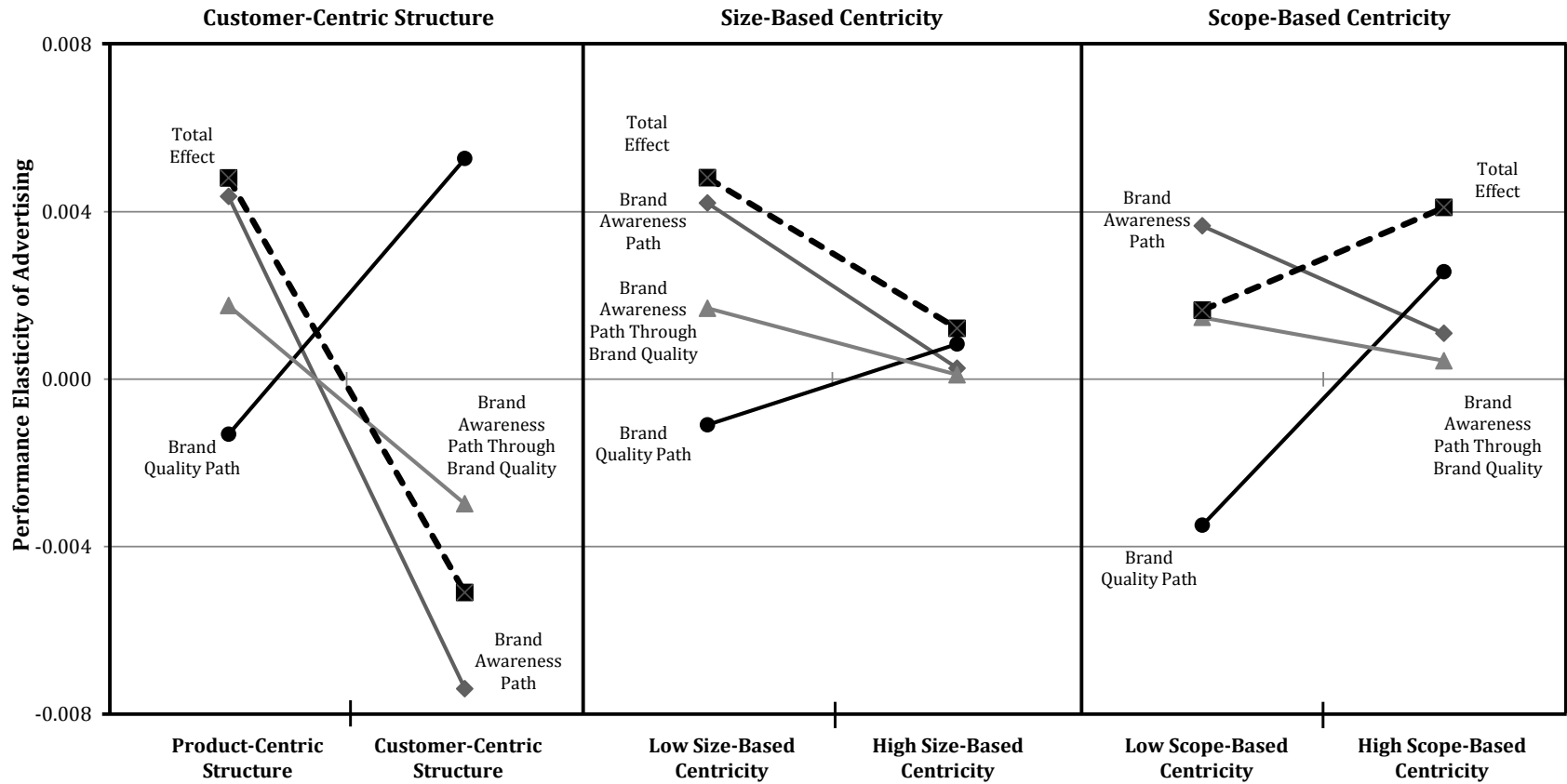
Note: I calculated the percentage using year 2011 data. Industries that accounted for less than 3% of the sample were grouped as "Others" (12%) (e.g. Chemicals, Construction, Electrical Equipment, and Textiles).

FIGURE 6
Sample Description: Advertising and R&D Expenditures Expressed As a Percentage of Total Assets across Industries



Note: I calculated the percentage using year 2011 data . A detailed description of the advertising and R&D measures is in Measures and Operationalization section.

FIGURE 7
Performance Elasticity of Advertising at Different Levels of Structural Sources of Customer Centricity



V. Discussion

Many academics and managers operate on the premise that investments in advertising and R&D will increase marketing and financial outcomes, but often do not consider the role of organizational structure that may leverage the effectiveness of advertising and R&D. This research therefore attempts to improve understanding of structural sources of customer centrality that can leverage the effects of advertising and R&D expenditures on brand equity and ultimately firm performance. Specifically, I developed and empirically tested a conceptual model that describes the moderating effects of three structural sources of customer centrality (i.e., customer-centric structure, size-based centrality, and scope-based centrality) on a firm's brand awareness, perceived brand quality, and ultimately, performance. The results from my longitudinal analyses showed that increased investment in advertising generates lower brand awareness when a firm has a greater level of structural sources of customer centrality. In contrast, increased investments in advertising or R&D generate greater perceived brand quality when a firm has more structural sources of customer centrality.

1. Structural Marketing: Theoretical and Research Implications

Although extant marketing literature predicts that a firm can improve brand awareness and perceived brand quality by spending more on advertising and R&D (Day 2006; Homburg, Workman, and Jensen 2000), my results suggest that such effects are contingent upon the level of customer centrality emanated from the firm's organizational structure. Specifically, structural sources of customer centrality have their benefits (effectiveness in increasing customer centrality) and costs (inefficiency due to duplication and internal complexity), which can help explain the varying returns from marketing mix. For example, a customer-centric structure deals with heterogeneity by organizing divisions around customers, which increases cost due to

infrastructure duplication and adds to communication complexity. Size-based centrality addresses market heterogeneity by decreasing the size of divisions so each entity can concentrate on a less diverse end market, which adds costs due to infrastructure duplication but reduces complexity. A scope-based centrality reduces the scope of the firm's overall served markets, which provides centrality benefits with low cost and complexity but with high opportunity costs associated with the inability to serve customers beyond focal markets.

Because these structural sources of customer centrality (i.e., customer-centric structure, size-based centrality, and scope-based centrality) operate as a holistic system, they moderate the impacts of advertising and R&D expenditures on brand and financial outcomes. Building upon configuration and contingency perspectives, I find significant negative interaction effects between advertising spending and a customer-centric structure, and negative interaction effects between advertising spending and size-based centrality on brand awareness. This is in support of my premise that advertising expenditure can be more efficiently deployed when a firm has a structure that supports economies of scale. For example, a firm's advertising is less likely to be exposed to more potential and current consumers when a firm has a structure that has greater communication complexity and economic inefficiency, so its investment will be less likely to increase brand awareness. Consistent with my theoretical model, the findings suggest that the effect of advertising on brand awareness is less positive when a firm organizes its divisions around customer groups (customer-centric structure) rather than product groups, and when a firm has smaller divisions (size-based centrality). Thus, ignoring these interactions when evaluating the effect of advertising on brand and financial performances may lead to biased results.

My findings also indicate that the effect of advertising spending on perceived brand quality is contingent on a firm's structural sources of customer centrality. Specifically, having smaller

divisions (size-based centrality) or targeting a limited set of end markets (scope-based centrality) significantly enhance the effect of advertising spending on brand quality. A firm's investment in advertising should better signal its commitment to and confidence in the brand when its structure allows employees to target its unique customer groups, so its investment will generate more brand quality. Thus, this research may explain mixed findings in prior research (Day 2006; Gulati 2009).

Moreover, my empirical analysis reveals that a firm's R&D spending can increase more brand quality when it has a higher level of structural sources of customer centrality (customer-centric structure, size-based centrality, scope-based centrality). A firm's investment in R&D allows employees to focus more on innovative and customer-focused products when a firm has a structure that captures customer knowledge, to respond quickly to changing needs, and to create committed customer-focused employees. As such, its investment will be more likely to increase brand quality by organizing its divisions around customer groups (customer-centric structure), by adopting smaller divisions (size-based centrality), or having a limited set of end markets (scope-based centrality). Consistent with the previous literature (e.g., Buil, Chernatony, and Martínez 2013; Yoo, Donthu, and Lee 2000), I also find that brand awareness has a positive impact on brand quality, and that both brand awareness and brand quality increase financial performance.

With these findings, I shed light on how managers can respond to the pressure to make their firms more "customer-oriented," "customer-centric," or "customer-focused" (Day 2006; Homburg, Workman, and Jensen 2000; Shah et al. 2006). Considering the moderating effects of structural sources of customer centrality on marketing mix-brand equity relationship vary, I suggest that marketing research should continue to integrate "organizational structure" as a key variable in marketing models. In addition to the variables in the conceptual model, other

structural design characteristics (e.g., centralization, formalization) need to be studied. The firm's use of its structural design elements to achieve marketing objectives (customer centricity, customer satisfaction, brand value, product development success) constitutes *structural marketing*, and leaving boardroom executives to make structural design decisions without guidance from such a structural marketing perspective may lead to unintended consequences that undermine marketing capabilities and performance. Thus, the significance of focusing on a firm's structural elements that "support market-driven values and behavior and reinforce desired behavior across the business" (Day 1990, p. 361) is meaningful on both conceptual and strategic grounds.

2. *Structural Marketing: Managerial Implications*

This research also offers several important managerial insights. First, my findings should assist executive managers in understanding the role of structural sources of customer centricity when evaluating the effects of advertising and R&D on various outcomes. As three sources of customer centricity differentially leverage the impact of advertising and R&D on brand outcomes, the question arises as to what is the ultimate financial performance. To provide insights into how these structural sources of customer centricity behave differently across different advertising and R&D profiles, I conducted post hoc analyses. For each interaction with marketing mix and structural sources of customer centricity, I median-split firms into high (top 50%) and low (bottom 50%) groups, then compared the average firm performance (ROA). This approach is independent of the model specification and allows me to directly compare the average firm's performance across the different conditions. I depict the results in Figure 8.

Analysis on firms that heavily spend on both advertising and R&D (high advertising–high R&D) and adopt a customer-centric structure shows that they perform 9% better than firms with

a product-centric structure. Similarly, those high–high (high advertising–high R&D) firms with smaller divisions (high size-based centrality) exhibit 36% greater performance than those with larger divisions (low size-based centrality). In contrast, the high–high firms that serve narrow end markets (high scope-based centrality) performed 24% lower than firms that serve broad end markets (low scope-based centrality).

Firms that heavily spend on advertising but little on R&D (high advertising–low R&D) and are organized by customer groups achieved 24% greater than those organized by product groups. In contrast, these high–low (high advertising–low R&D) firms achieve 12% lower performance when they have smaller divisions (high size-based centrality) versus when they do not. The high–low firms achieve also 14% higher performance when they compete in few narrow end markets (high scope-based centrality) versus when they do not.

Moreover, firms which spend little on advertising but heavily on R&D (low advertising–high R&D) and have a customer-centric structure achieved only 2% lower performance than those with a product-centric structure. These low–high (low advertising–high R&D) firms with high size-based centrality perform 18% better than those with low size-based centrality. In contrast, the low–high firms with high scope-based centrality performed 19% lower than firms with low scope-based centrality.

Finally, firms that spend little on advertising and R&D (low advertising–low R&D) and are organized by customer groups performed 48% lower than those organized by product groups. These low–low firms that have smaller divisions (high size-based centrality) exhibit 37% lower performance than those firms that have larger divisions (low size-based centrality). In contrast, the low–low (low advertising–low R&D) firms that serve narrow end markets (high scope-based centrality) performed 40% higher than firms that serve broad end markets (low scope-based

centricity).

Therefore, depending on a firm's advertising and R&D profiles, three structural sources of customer centricity have differential effects on firm performance. Managers should keep a closer eye on their marketing mix activities and on their structural sources of customer centricity to avoid any potentially damaging effects on performance.

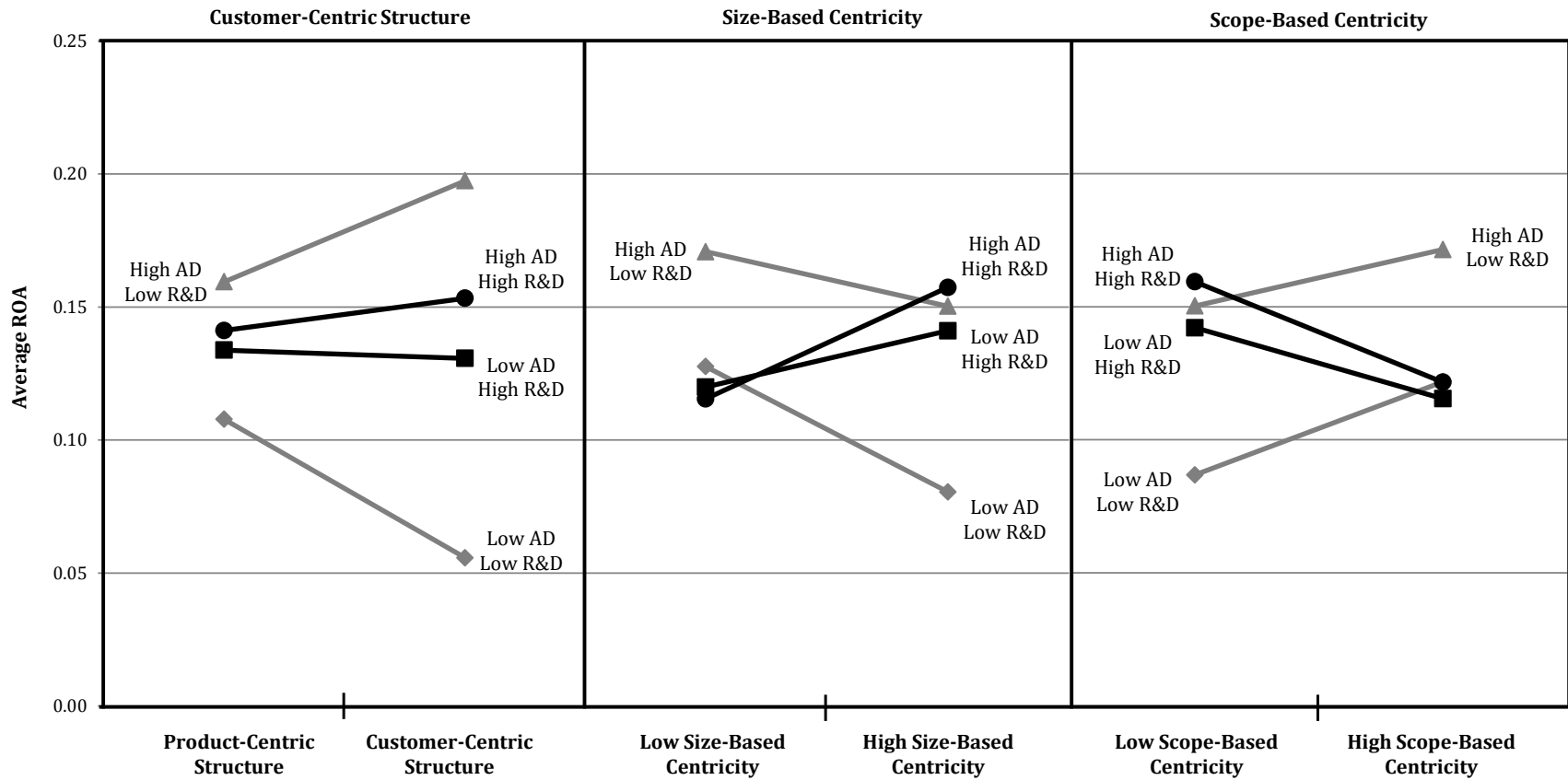
3. Limitations and Future Research Directions

The nature of my sample firms from EquiTrend and COMPUSTAT limits my results to large, publicly-traded firms in the United States. My main findings may be generalizable to a broader context, but they may not necessarily hold for smaller firms or in specific international markets. Therefore, there is a clear need for more research on this topic in other contexts.

I used secondary data to analyze my model across a 7-year period, which creates both strengths and weaknesses. Additional research might explore different data sources such as surveys and in-depth interviews, or employ other approaches such as event study to verify some of my proxy measures and tease out any dynamic effects over time.

Finally, my study is one step in describing the domain of structural marketing. Many other issues require further attention and research. Specifically, I call for further research to examine the impact of organizational structure in various marketing contexts (e.g., innovation, strategic alliance, chief marketing officer presence, channel relationships, brand acquisition). I hope my work stimulates such expansive research in this important domain.

FIGURE 8
Post Hoc Analysis: Average Performance at Different Levels of Advertising, R&D, and Structural Sources of Customer Centricity



LIST OF REFERENCES

- 3M Co. (2003), "10-K Report for 2003 Fiscal Year," (accessed June 21, 2011), [available at http://www.sec.gov/Archives/edgar/data/66740/000089710104000425/mmm041053s1_10k.htm].
- Aaker, David A. (2004), "Leveraging the Corporate Brand," *California Management Review*, 46 (3), 6-18.
- (1991), *Managing Brand Equity: Capitalizing On the Value of a Brand Name*. New York: Free Press.
- (1996), "Measuring Brand Equity across Products and Markets," *California Management Review*, 38 (3), 102-20.
- and Robert Jacobson (1994), "The Financial Information Content of Perceived Quality," *Journal of Marketing Research*, 31 (2), 191-201.
- and Erich Joachimsthaler (2000), "The Brand Relationship Spectrum: The Key to the Brand Architecture Challenge," *California Management Review*, 42 (4), 8-23.
- Ailawadi, Kusum L., Donald R. Lehmann, and Scott A. Neslin (2003), "Revenue Premium as an Outcome Measure of Brand Equity," *Journal of Marketing*, 67, 1-17.
- Amit, Raphael and Joshua Livnat (1988), "Diversification Strategies, Business Cycles and Economic Performance," *Strategic Management Journal*, 9 (2), 99-110.
- Anderson, Eugene W., Claes Fornell, and Sanal K. Mazvancheryl (2004), "Customer Satisfaction and Shareholder Value," *Journal of Marketing*, 68 (4), 172-85.
- Arellano, Manuel (1987), "Computing Robust Standard Errors for Within-groups Estimators," *Oxford Bulletin of Economics & Statistics*, 49 (4), 431-34.
- Argyres, Nicholas S. and Brian S. Silverman (2004), "R&D, Organization Structure, and the Development of Corporate Technological Knowledge," *Strategic Management Journal*, 25 (8-9), 929-58.
- Baker, William and James Sinkula (1999), "The synergistic effect of market orientation and learning orientation on organizational performance," *Journal of the Academy of Marketing Science*, 27 (4), 411-27.
- Balachander, Subramanian and Axel Stock (2009), "Limited Edition Products: When and When Not to Offer Them," *Marketing Science*, 28 (2), 336-55.
- Baum, Christopher F. (2006), *An Introduction to Modern Econometrics Using Stata*. College Station, TX: Stata Press.

Becker, Jan U., Goetz Greve, and Sönke Albers (2009), "The Impact of Technological and Organizational Implementation of CRM on Customer Acquisition, Maintenance, and Retention," *International Journal of Research in Marketing*, 26 (3), 207-15.

Berthon, Pierre, James M. Hulbert, and Leyland F. Pitt (1999), "Brand management prognostications," *Sloan Management Review*, 40 (2), 53-65.

Bharadwaj, Sundar G., Kapil R. Tuli, and Andre Bonfrer (2011), "The Impact of Brand Quality on Shareholder Wealth," *Journal of Marketing*, 75 (5), 88-104.

Blattberg, Robert C., Richard Briesch, and Edward J. Fox (1995), "How Promotions Work," *Marketing Science*, 14 (3), G122.

Booz & Company (2011), "The Global Innovation 1000: Why Culture Is Key," 65 (Winter).

Boulding, William, Eunkyoo Lee, and Richard Staelin (1994), "Mastering the Mix: Do Advertising, Promotion, and Sales Force Activities Lead to Differentiation?," *Journal of Marketing Research*, 31 (2), 159-72.

Brickley, James A. and Leonard D. Van Drunen (1990), "Internal Corporate Restructuring : An Empirical Analysis," *Journal of Accounting and Economics*, 12 (1-3), 251-80.

Buil, Isabel, Leslie de Chernatony, and Eva Martínez (2013), "Examining the Role of Advertising and Sales Promotions in Brand Equity Creation," *Journal of Business Research*, 66 (1), 115-22.

Burch, Timothy R. and Vikram Nanda (2003), "Divisional Diversity and the Conglomerate Discount: Evidence from Spinoffs," *Journal of Financial Economics*, 70 (1), 69-98.

BusinessWeek (2009), "Pfizer: Making It 'Leaner, Meaner, More Efficient'," (accessed February 21, 2012), [available at http://www.businessweek.com/managing/content/feb2009/ca20090227_655650.htm].

——— (2005a), "Shaking Up Intel's Insides," (accessed April 26, 2012), [available at http://www.businessweek.com/magazine/content/05_05/b3918074_mz011.htm].

——— (2005b), "The Un-Carly Unveils His Game Plan," (accessed June 2, 2011), [available at http://www.businessweek.com/magazine/content/05_26/b3939061_mz011.htm].

——— (1998), "A Slippery Slope for North Face," (December 7), 66-68.

Campbell, Margaret C and Kevin Lane Keller (2003), "Brand Familiarity and Advertising Repetition Effects," *Journal of Consumer Research*, 30 (2), 292-304.

Capon, Noel, John U. Farley, and Scott Hoenig (1990), "Determinants of Financial Performance: A Meta-Analysis," *Management Science*, 36 (10), 1143-59.

- Capron, Laurence and John HULLAND (1999), "Redeployment of Brands, Sales Forces, and General Marketing Management Expertise Following Horizontal Acquisitions: A Resource-Based View," *Journal of Marketing*, 63 (2), 41-54.
- Child, John and Rita Gunther McGrath (2001), "Organizations Unfettered: Organizational Form in an Information-Intensive Economy," *Academy of Management Journal*, 44 (6), 1135-48.
- Christensen, Clayton M. (1997), *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston, MA: Harvard Business School Press.
- Chu, Singfat and HeanTat Keh (2006), "Brand Value Creation: Analysis of the Interbrand-Business Week Brand Value Rankings," *Marketing Letters*, 17 (4), 323-31.
- Chung, Kee H. and Stephen W. Pruitt (1994), "A Simple Approximation of Tobin's q," *Financial Management*, 23 (3), 70-74.
- Clark, C., Ulrich Doraszelski, and Michaela Draganska (2009), "The Effect of Advertising on Brand Awareness and Perceived Quality: An Empirical Investigation Using Panel Data," *Quantitative Marketing & Economics*, 7 (2), 207-36.
- Cobb-Walgren, Cathy J., Cynthia A. Ruble, and Naveen Donthu (1995), "Brand Equity, Brand Preference, and Purchase Intent," *Journal of Advertising*, 24 (3), 25-40.
- D'Souza, Giles and Ram C. Rao (1995), "Can Repeating an Advertisement More Frequently Than the Competition Affect Brand Preference in a Mature Market?," *Journal of Marketing*, 59 (2), 32-42.
- Davidson, Russell and James G. MacKinnon (1993), *Estimation and Inference in Econometrics*. Oxford: Oxford University Press.
- Day, George S. (2006), "Aligning the Organization with the Market," *MIT Sloan Management Review*, 48 (1), 41-49.
- (1999), *The Market Driven Organization: Understanding, Attracting, and Keeping Valuable Customers*. New York: The Free Press.
- (1990), *Market Driven Strategy: Processes for Creating Value*. New York and London: The Free Press and Collier Macmillan.
- Dechow, Patricia M. and Richard G. Sloan (1991), "Executive Incentives and The Horizon Problem: An Empirical Investigation," *Journal of Accounting and Economics*, 14 (1), 51-89.
- Dell (2010), "10-K Report for 2009 Fiscal Year," (accessed February 20, 2012), [available at <http://www.sec.gov/Archives/edgar/data/826083/000095012310025998/d70787e10vk.htm>].
- Desai, Hemang and Prem C. Jain (1999), "Firm Performance and Focus: Long-Run Stock

- Market Performance Following Spinoffs," *Journal of Financial Economics*, 54 (1), 75-101.
- Donaldson, Lee (2001), *The Contingency Theory of Organizations*. Thousand Oaks, CA: Sage.
- Drazin, Robert and Andrew H. Van de Ven (1985), "Alternative Forms of Fit in Contingency Theory," *Administrative Science Quarterly*, 30 (4), 514-39.
- Drucker, Peter F. (1954), *The Practice of Management*. New York: Harper.
- Duncan, Tom and Sandra E. Moriarty (1998), "A Communication-Based Marketing Model for Managing Relationships," *Journal of Marketing*, 62 (2), 1-13.
- Eisenhardt, Kathleen M. and Shona L. Brown (1999), "Patching. Restitching Business Portfolios in Dynamic Markets," *Harvard Business Review*, 77 (3), 72-82.
- Erdem, Tülin, Michael P. Keane, and Baohong Sun (2008), "A Dynamic Model of Brand Choice When Price and Advertising Signal Product Quality," *Marketing Science*, 27 (6), 1111-25.
- , Joffre Swait, and Ana Valenzuela (2006), "Brands as Signals: A Cross-Country Validation Study," *Journal of Marketing*, 70 (1), 34-49.
- Ettredge, Michael L., Soo Young Kwon, David B. Smith, and Paul A. Zarowin (2005), "The Impact of SFAS No. 131 Business Segment Data on the Market's Ability to Anticipate Future Earnings," *Accounting Review*, 80 (3), 773-804.
- Fang, Eric, Robert W. Palmatier, and Rajdeep Grewal (2011), "Effects of Customer and Innovation Asset Configuration Strategies on Firm Performance," *Journal of Marketing Research*, 48 (3), 587-602.
- , Robert W. Palmatier, and Jan-Benedict E. M. Steenkamp (2008), "Effect of Service Transition Strategies on Firm Value," *Journal of Marketing*, 72 (September), 1-14.
- Financial Accounting Standards Board (FASB) (1997), "Disclosures about Segments of an Enterprise and Related Information," in Statement of Financial Accounting Standards No. 131. Norwalk, CT: FASB.
- Galbraith, Craig S. and Gregory B. Merrill (1991), "The Effect of Compensation Program and Structure on SBU Competitive Strategy: A Study of Technology-Intensive Firms," *Strategic Management Journal*, 12 (5), 353-70.
- Galbraith, Jay R. (2005), *Designing the Customer-Centric Organization: A Guide to Strategy, Structure, and Process*. San Francisco, CA: Jossey-Bass A Wiley Imprint.
- , Diane Downey, and Amy Kates (2002), *Designing Dynamic Organizations : A Hands-on Guide for Leaders at All Levels*. New York: AMACOM.

Gow, Ian D., Gaizka Ormazabal, and Daniel J. Taylor (2010), "Correcting for Cross-Sectional and Time-Series Dependence in Accounting Research," *Accounting Review*, 85 (2), 483-512.

Greene, William H. (2000), *Econometric Analysis* (4 ed.). Upper Saddle River, NJ: Prentice Hall.

Griffin, Abbie and John R. Hauser (1996), "Integrating R&D and Marketing: A Review and Analysis of the Literature," *Journal of Product Innovation Management*, 13 (3), 191-215.

Gulati, Ranjay (2009), *Reorganize for Resilience: Putting Customers at the Center of Your Business*. Boston, MA: Harvard Business Press.

——— (2007), "Silo Busting," *Harvard Business Review*, 85 (5), 98-108.

Hirschey, Mark and Jerry J. Weygandt (1985), "Amortization Policy for Advertising and Research and Development Expenditures," *Journal of Accounting Research*, 23 (1), 326-35.

Homburg, Christian, Martin Klarmann, and Jens Schmitt (2010), "Brand Awareness in Business Markets: When Is It Related to Firm Performance?," *International Journal of Research in Marketing*, 27 (3), 201-12.

———, John P. Workman, Jr, and Harley Krohmer (1999), "Marketing's Influence Within the Firm," *Journal of Marketing*, 63 (2), 1-17.

———, John P. Workman, Jr., and Ove Jensen (2000), "Fundamental Changes in Marketing Organization: The Movement toward a Customer-Focused Organizational Structure," *Journal of the Academy of Marketing Science*, 28 (4), 459-78.

Hoskisson, Robert E., Richard A. Johnson, and Douglas D. Moesel (1994), "Corporate Divestiture Intensity in Restructuring Firms: Effects of Governance, Strategy, and Performance," *Academy of Management Journal*, 37 (5), 1207-51.

Hoskisson, Robert O. and Richard A. Johnson (1992), "Corporate Restructuring and Strategic Change: The Effect on Diversification Strategy and R&D Intensity," *Strategic Management Journal*, 13 (8), 625-34.

Hoyer, Wayne D. and Steven P. Brown (1990), "Effects of Brand Awareness on Choice for a Common, Repeat-Purchase Product," *Journal of Consumer Research*, 17 (2), 141-48.

Huang, Rong and Emine Sarigöllü (2012), "How Brand Awareness Relates to Market Outcome, Brand Equity, and the Marketing Mix," *Journal of Business Research*, 65 (1), 92-99.

Humana Inc. (2002), "10-K Report for 2001 Fiscal Year," (accessed June 21, 2011), [available at <http://www.sec.gov/Archives/edgar/data/49071/000095013102001193/d10k405.htm>].

Jayachandran, Satish, Subhash Sharma, Patrick J. Kaufmann, and Pushkala Raman (2005), "The Role of Relational Information Processes and Technology Use in Customer Relationship

Management," *Journal of Marketing*, 69 (4), 177-92.

Johansson, Johny K., Claudiu V. Dimofte, and Sanal K. Mazvancheryl (2012), "The Performance of Global Brands in the 2008 Financial Crisis: A Test of Two Brand Value Measures," *International Journal of Research in Marketing*, 29 (3), 235-45.

Johnson, Eric J. and J. Edward Russo (1984), "Product Familiarity and Learning New Information," *Journal of Consumer Research*, 11 (1), 542-50.

Kantar Media (2012), "Kantar Media Reports U.S. Advertising Expenditures Increased 0.8 Percent in 2011," [available at <http://kantarmediana.com/insight-center/news/kantar-media-reports-us-advertising-expenditures-increased-08-percent-2011?destination=node%2F70%2Fnews>].

Kay, Neil M. (1988), "The R&D Function: Corporate Strategy and Structure," in *Technical Change and Economic Theory*, Christopher Freeman Giovanni Dosi, Richard Nelson, Gerald Silverberg, Luc Soete, ed. London; New York: Pinter Publishers.

Keller, Kevin Lane (1993), "Conceptualizing, Measuring, and Managing Customer-Based Brand Equity," *Journal of Marketing*, 57 (1), 1-22.

——— (1987), "Memory Factors in Advertising: The Effect of Advertising Retrieval Cues on Brand Evaluations," *Journal of Consumer Research*, 14 (3), 316-33.

Kirmani, Amna (1990), "The Effect of Perceived Advertising Costs on Brand Perceptions," *Journal of Consumer Research*, 17 (2), 160-71.

——— and Akshay R. Rao (2000), "No Pain, No Gain: A Critical Review of the Literature in Signaling Unobserved Product Quality," *Journal of Marketing*, 64, 66-79.

——— and Peter Wright (1989), "Money Talks: Perceived Advertising Expense and Expected Product Quality," *Journal of Consumer Research*, 16 (3), 344-53.

Krasnikov, Alexander, Saurabh Mishra, and David Orozco (2009), "Evaluating the Financial Impact of Branding Using Trademarks: A Framework and Empirical Evidence," *Journal of Marketing*, 73 (6), 154-66.

Krishnan, H. S. (1996), "Characteristics of Memory Associations: A Consumer-Based Brand Equity Perspective," *International Journal of Research in Marketing*, 13 (4), 389-405.

Kumar, V., Rajkumar Venkatesan, and Werner Reinartz (2008), "Performance Implications of Adopting a Customer-Focused Sales Campaign," *Journal of Marketing*, 72, 50-68.

Lane, Vicki and Robert Jacobson (1995), "Stock Market Reactions to Brand Extension Announcements: The Effects of Brand Attitude and Familiarity," *Journal of Marketing*, 59 (1), 63-77.

Lawler, Edward E. (1996), *From the Ground Up: Six Principles for Building the New Logic Corporation*. San Francisco: Jossey-Bass Publishers.

Leiponen, Aija and Constance E. Helfat (2011), "Location, Decentralization, and Knowledge Sources for Innovation," *Organization Science*, 22 (3), 641-58.

Lev, Baruch and Theodore Sougiannis (1996), "The Capitalization, Amortization, and Value-Relevance of R&D," *Journal of Accounting and Economics*, 21 (1), 107-38.

Luo, Xueming, Jan Wieseke, and Christian Homburg (2012), "Incentivizing CEOs to Build Customer- And Employee-Firm Relations for Higher Customer Satisfaction and Firm Value," *Journal of the Academy of Marketing Science*, 40 (6), 745-58.

Marketing Science Institute (2010), *2010-2012 Research Priorities: A Guide to MSI Research Programs and Procedures*. Cambridge, MA: Marketing Science Institute.

——— (2012), *2012-2014 Research Priorities: A Guide to MSI Research Programs and Procedures*. Cambridge, MA: Marketing Science Institute.

Markides, Constantinos C. (1992), "Consequences of Corporate Refocusing: Ex Ante Evidence," *Academy of Management Journal*, 35 (2), 398-412.

——— and Peter J. Williamson (1996), "Corporate Diversification and Organizational Structure: A Resource-Based View," *Academy of Management Journal*, 39 (2), 340-67.

McAlister, Leigh, Raji Srinivasan, and MinChung Kim (2007), "Advertising, Research and Development, and Systematic Risk of the Firm," *Journal of Marketing*, 71 (1), 35-48.

McDougall, Patricia Phillips, Jeffrey G. Covin, Richard B. Robinson, Jr., and Lanny Herron (1994), "The Effects of Industry Growth and Strategic Breadth on New Venture Performance and Strategy Content," *Strategic Management Journal*, 15 (7), 537-54.

Mela, Carl F., Sunil Gupta, and Donald R. Lehmann (1997), "The Long-Term Impact of Promotion and Advertising on Consumer Brand Choice," *Journal of Marketing Research*, 34 (2), 248-61.

Menon, Anil, Sundar G. Bharadwaj, Phani Tej Adidam, and Steven W. Edison (1999), "Antecedents and Consequences of Marketing Strategy Making: A Model and a Test," *Journal of Marketing*, 63 (2), 18-40.

Milgrom, Paul and John Roberts (1986), "Price and Advertising Signals of Product Quality," *Journal of Political Economy*, 94 (4), 796-821.

Miller, Danny (1996), "Configurations Revisited," *Strategic Management Journal*, 17 (7), 505-12.

- (1988), "Relating Porter's Business Strategies to Environment and Structure: Analysis and Performance Implications," *Academy of Management Journal*, 31 (2), 280-308.
- Mintzberg, Henry (1983), *Structure in Fives: Designing Effective Organizations*. Englewood Cliffs, NJ: Prentice-Hall.
- Mitra, Debanjan and Peter N. Golder (2006), "How Does Objective Quality Affect Perceived Quality? Short-Term Effects, Long-Term Effects, and Asymmetries," *Marketing Science*, 25 (3), 230-47.
- Mizik, Natalie and Robert Jacobson (2003), "Trading Off Between Value Creation and Value Appropriation: The Financial Implications of Shifts in Strategic Emphasis," *Journal of Marketing*, 67 (1), 63-76.
- (2009), "Valuing Branded Businesses," *Journal of Marketing*, 73 (6), 137-53.
- Moorthy, Sridhar and Hao Zhao (2000), "Advertising Spending and Perceived Quality," *Marketing Letters*, 11 (3), 221-33.
- Morgan, Neil A. and Lopo Leotte Rego (2006), "The Value of Different Customer Satisfaction and Loyalty Metrics in Predicting Business Performance," *Marketing Science*, 25 (5), 426-39.
- Naik, Prasad A., Kalyan Raman, and Russell S. Winer (2005), "Planning Marketing-Mix Strategies in the Presence of Interaction Effects," *Marketing Science*, 24 (1), 25-34.
- Narver, John C. and Stanley F. Slater (1990), "The Effect of a Market Orientation on Business Profitability," *Journal of Marketing*, 54 (4), 20-35.
- Nedungadi, Prakash (1990), "Recall and Consumer Consideration Sets: Influencing Choice without Altering Brand Evaluations," *Journal of Consumer Research*, 17 (3), 263-76.
- Neff, Jack (2008), "Reorganization Doesn't Do It for Marketers," *Advertising Age* (March 4).
- Nelson, Phillip (1974), "Advertising as Information," *Journal of Political Economy*, 82 (4), 729.
- Olson, Eric M., Stanley F. Slater, and G. Tomas M. Hult (2005), "The Performance Implications of Fit Among Business Strategy, Marketing Organization Structure, and Strategic Behavior," *Journal of Marketing*, 69, 49-65.
- , Orville C. Walker, Jr., and Robert W. Ruekert (1995), "Organizing for Effective New Product Development: The Moderating Role of Product Innovativeness," *Journal of Marketing*, 59 (1), 48-62.
- Park, C. Whan, Bernard J. Jaworski, and Deborah J. MacInnis (1986), "Strategic Brand Concept-Image Management," *Journal of Marketing*, 50 (4), 135-45.

- Park, Chan Su and V. Srinivasan (1994), "A Survey-Based Method for Measuring and Understanding Brand Equity and Its Extendibility," *Journal of Marketing Research*, 31 (2), 271-88.
- Percy, Larry and John R. Rossiter (1992), "A Model of Brand Awareness and Brand Attitude Advertising Strategies," *Psychology & Marketing*, 9 (4), 263-74.
- Petersen, Mitchell A. (2009), "Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches," *Review of Financial Studies*, 22 (1), 435-80.
- Peterson, Robert and Jaeseok Jeong (2010), "Exploring the Impact of Advertising and R&D Expenditures on Corporate Brand Value and Firm-Level Financial Performance," *Journal of the Academy of Marketing Science*, 38 (6), 677-90.
- Phan, Phillip H. and Charles W. L. Hill (1995), "Organizational Restructuring and Economic Performance in Leveraged Buyouts: An Ex Post Study," *Academy of Management Journal*, 38 (3), 704-39.
- Porter, Michael E. (1985), *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: The Free Press.
- Rao, Vithala R., Manoj K. Agarwal, and Denise Dahlhoff (2004), "How Is Manifest Branding Strategy Related to the Intangible Value of a Corporation?," *Journal of Marketing*, 68 (4), 126-41.
- Rego, Lopo L., Matthew T. Billett, and Neil A. Morgan (2009), "Consumer-Based Brand Equity and Firm Risk," *Journal of Marketing*, 73 (6), 47-60.
- Reinartz, Werner, Manfred Krafft, and Wayne D. Hoyer (2004), "The Customer Relationship Management Process: Its Measurement and Impact on Performance," *Journal of Marketing Research*, 41 (3), 293-305.
- Rice, Butch and Richard Bennett (1998), "The Relationship Between Brand Usage and Advertising Tracking Measurements: International Findings," *Journal of Advertising Research*, 38 (3), 58-66.
- Rossiter, John R. and Larry Percy (1997), *Advertising Communications & Promotion Management*. New York: McGraw-Hill Companies.
- Ruekert, Robert W. and Orville C. Walker, Jr. (1987), "Marketing's Interaction with Other Functional Units: A Conceptual Framework and Empirical Evidence," *Journal of Marketing*, 51 (1), 1-19.
- , ———, and Kenneth J. Roering (1985), "The Organization of Marketing Activities: A Contingency Theory of Structure and Performance," *Journal of Marketing*, 49 (1), 13-25.
- Rust, Roland T., Christine Moorman, and Gaurav Bhalla (2010), "Rethinking Marketing,"

Harvard Business Review, 88 (1/2), 94-101.

Selden, Larry and Ian C. MacMillan (2006), "Manage Customer-Centric Innovation—Systematically," *Harvard Business Review*, 84 (4), 108-16.

Sethuraman, Raj, Gerard J. Tellis, and Richard A. Briesch (2011), "How Well Does Advertising Work? Generalizations from Meta-Analysis of Brand Advertising Elasticities," *Journal of Marketing Research*, 48 (3), 457-71.

Shah, Denish, Roland T. Rust, A. Parasuraman, Richard Staelin, and George S. Day (2006), "The Path to Customer Centricity," *Journal of Service Research*, 9 (2), 113-24.

Simon, Carol J. and Mary W. Sullivan (1993), "The Measurement and Determinants of Brand Equity: A Financial Approach," *Marketing Science*, 12 (1), 28-52.

Singh, Manohar, Sheri Faircloth, and Ali Nejadmalayeri (2005), "Capital Market Impact of Product Marketing Strategy: Evidence from the Relationship between Advertising Expenses and Cost of Capital," *Journal of the Academy of Marketing Science*, 33 (4), 432-44.

Srinivasan, Raji, Gary L. Lilien, and Shrihari Sridhar (2011), "Should Firms Spend More on Research and Development and Advertising During Recessions?," *Journal of Marketing*, 75 (3), 49-65.

Srivastava, Rajendra K., Tasadduq A. Shervani, and Liam Fahey (1998), "Market-Based Assets and Shareholder Value: A Framework for Analysis," *Journal of Marketing*, 62 (1), 2-18.

Tuli, Kapil R., Anirban Mukherjee, and Marnik G. Dekimpe (2012), "On the Value Relevance of Retailer Advertising Spending and Same-store Sales Growth," *Journal of Retailing*, 88 (4), 447-61.

Vakratsas, Demetrios and Tim Ambler (1999), "How Advertising Works: What Do We Really Know?," *Journal of Marketing*, 63 (1), 26-43.

Vance, Ashlee and Todd R. Weiss (2002), "Intel and Loudcloud Plan to Quit Web Hosting Business," *Computerworld*, 36 (26), 8.

Varadarajan, P Rajan, Satish Jayachandran, and Chris White (2001), "Strategic Interdependence in Organizations: Deconglomeration and Marketing Strategy," *Journal of Marketing*, 65 (1), 15-28.

Vorhies, Douglas W. (1998), "An Investigation of the Factors Leading To the Development of Marketing Capabilities and Organizational Effectiveness," *Journal of Strategic Marketing*, 6 (1), 3-23.

Vorhies, Douglas W. and Neil A. Morgan (2003), "A Configuration Theory Assessment of Marketing Organization Fit with Business Strategy and Its Relationship with Marketing

Performance," *Journal of Marketing*, 67 (1), 100-15.

Walker, Orville C., Jr. and Robert W. Ruekert (1987), "Marketing's Role in the Implementation of Business Strategies: A Critical Review and Conceptual Framework," *Journal of Marketing*, 51 (3), 15-33.

Wang, Fang, Xiao-Ping Zhang, and Ming Ouyang (2009), "Does Advertising Create Sustained Firm Value? The Capitalization of Brand Intangible," *Journal of the Academy of Marketing Science*, 37 (2), 130-43.

Workman, John P., Jr., Christian Homburg, and Kjell Gruner (1998), "Marketing Organization: An Integrative Framework of Dimensions and Determinants," *Journal of Marketing*, 62 (3), 21-41.

Xie, Biao, Wallace N. Davidson III, and Peter J. DaDalt (2003), "Earnings Management and Corporate Governance: The Role of the Board and the Audit Committee," *Journal of Corporate Finance*, 9 (3), 295-316.

Yim, Frederick Hong-kit, Rolph E. Anderson, and Srinivasan Swaminathan (2004), "Customer Relationship Management: Its Dimensions and Effect on Customer Outcomes," *Journal of Personal Selling & Sales Management*, 24 (4), 263-78.

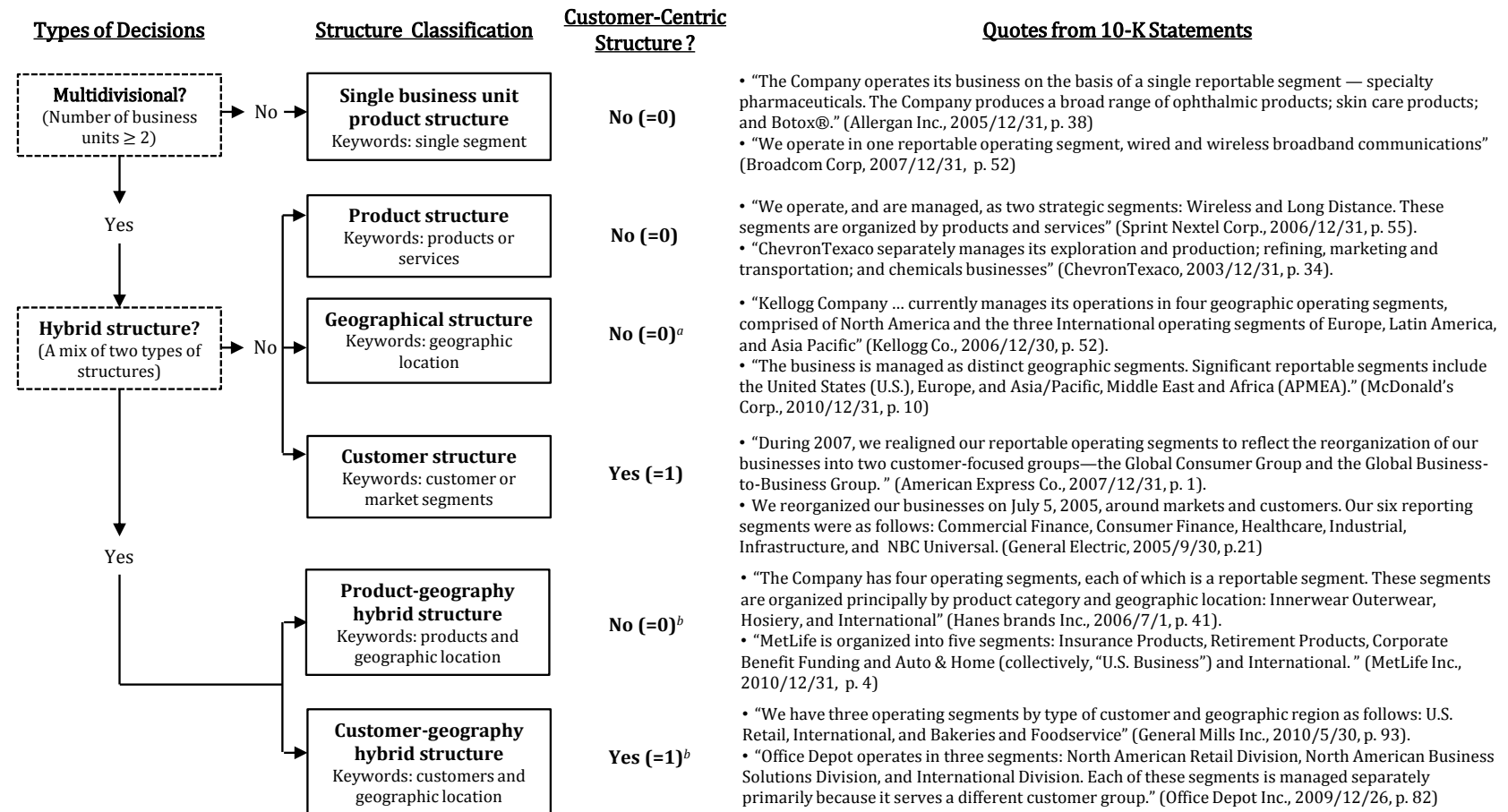
Yoo, Boonghee, Naveen Donthu, and Sungho Lee (2000), "An Examination of Selected Marketing Mix Elements and Brand Equity," *Journal of the Academy of Marketing Science*, 28 (2), 195-211.

Zahra, Shaker A. and Gerard George (2002), "Absorptive Capacity: A Review, Reconceptualization, and Extension," *Academy of Management Review*, 27 (2), 185-203.

Zeithaml, Valarie A. (1988), "Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence," *Journal of Marketing*, 52 (3), 2-22.

APPENDIX
Coding Procedures and Examples of Firms' Organizational Structure, Coded From 10-K Statements

The firm's structure type appears in the Form 10-K Securities and Exchange Commission filings, available at <<http://www.sec.gov/edgar/searchedgar/companysearch.html>>. I searched for "segment information" in each firm's 10-K statement for every year from 1998 to 2011. According to Financial Accounting Standards Board (FASB) Statement No. 131, companies are required to report segment information consistent with their internal organizational structure. A business operating segment is defined as "a component of an enterprise engages in business activities from which it may earn revenues and incur expenses" (FASB 1997, p. 7), so it reflects the firm's structural units. I obtained sales revenues from each operating segment from the COMPUSTAT Business Segments database.



^a I did not include pure geographic structure firms in the analyses.

^b I reclassified product-geography hybrid structure to product structures, and customer-geography hybrid structure to customer-centric structure in the analyses if sales from geographical business units (i.e., international division) accounts for less than 50% of the firm's total sales.

Vita

Ju-Yeon Lee was born in Changwon, South Korea. In 2004, she entered Yonsei University in Seoul, South Korea. From 2006 to 2007, she studied Statistics and Economics at University of Washington-Seattle as an exchange student. In 2008, she received the degree of Bachelor in Business Administration and Applied Statistics from Yonsei University. In 2013, she earned a Doctor of Philosophy degree in Marketing from University of Washington in Seattle, WA.