REBECCA J. SLOTEGRAAF, CHRISTINE MOORMAN, and J. JEFFREY INMAN*

Researchers in marketing tend to adopt one of two approaches to examining competitive advantage: a focus on a firm's resources or a focus on a firm's strategic or tactical actions. The authors suggest that neither of these approaches by itself fully captures the drivers of competitive advantage. Focusing on marketing-specific actions referred to as market deployment, the authors investigate the roles of both resources and action by examining how the nature and level of a firm's resources influence the success of the firm's marketing actions. The results, based on a secondary data approach and a series of sequentially estimated hierarchical regression models, indicate that resource possession influences returns to market deployment. Specifically, higher levels of intangible marketing resources and intangible technological resources increase the effectiveness of market deployment related to distribution and coupon activity, whereas higher levels of financial resources decrease the effectiveness of these types of market deployment.

The Role of Firm Resources in Returns to Market Deployment

Strategy researchers exalt organizational resources as essential to competitive advantage (e.g., Barney 1991; Grant 1991). This perspective, grounded in the resource-based view of the firm (Wernerfelt 1984), has influenced several research domains, including marketing strategy (Day 1994). For example, research has examined the competitive effects of brand equity (e.g., Keller 1993), customer and partner relationships (e.g., Srivastava, Shervani, and Fahey 1998), and knowledge assets (Glazer 1991). Researchers who adopt this view tend to emphasize the value of *resource possession* by focusing on those resources that create and sustain competitive advantage.

Other researchers have focused on the value of *resource deployment* actions. For example, researchers in marketing have investigated brand-level marketing actions such as pricing (e.g., Hoch et al. 1995), coupon activity (e.g., Raghubir 1998), promotional efforts (e.g., Blattberg, Briesch, and Fox 1995), and distribution coverage (e.g., Reibstein and Farris 1995). Although much of this research tends to assume that the competitive environment is the critical factor influencing the effects of various actions, researchers in this area are beginning to acknowledge effects due to firm-specific resources (e.g., Ailawadi, Lehmann, and Neslin 2001). Most of the research, however, appears to assume implicitly either that firm resources are perfectly revealed in a firm's actions or that the marginal return from resource deployment is the same across all levels and types of firm resources.

Although these streams of literature have evolved independently, both practice and research point to important gains from their integration. In terms of practice, there is evidence that firms often do not effectively deploy available resources. For example, IBM faltered when its large sales force and research and development (R&D) assets were not deployed in ways consistent with market changes (Hartley 1998). In other cases, it appears that resource levels may actually influence the astuteness of resource deployment. For example, Southwest Airlines's initial resource-poor status resulted in its design of market-driven strategies that enabled it to achieve great success and increase its resources over time (e.g., Kaydo 1998).

In terms of research, several studies suggest that the integration of resource possession and deployment is desirable. In the marketing-mix literature, Ailawadi, Lehmann, and Neslin (2001) illustrate the importance of a firm's resources to its pricing strategy by including fixed firm effects in the

*Rebecca J. Slotegraaf is Assistant Professor of Marketing, Kelley School of Business, Indiana University (e-mail: rslotegr@indiana.edu). Christine Moorman is Professor of Marketing, Fuqua School of Business, Duke University (e-mail: moorman@duke.edu). J. Jeffrey Inman is Thomas Marshall Professor of Marketing, Katz School of Business, University of Pittsburgh (e-mail: jinman@katz.pitt.edu). The authors appreciate the valuable comments of Mason Carpenter, Peter Dickson, Amy Dittmar, Jeff Douglas, and Rosann Spiro on a previous version of this article and analysis and the research support of Maura Troester and Michael Enyart. The authors also thank David Krull from ACNielsen, who provided a major portion of the data for this research, and Robert Drane from Information Resources Inc. for providing additional data. The authors thank the three anonymous *JMR* reviewers and Dick Wittink for their constructive comments and valuable suggestions.

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model. Using the resource-based view of the firm, Dutta, Narasimhan, and Rajiv (1999) examine the efficiency with which firms use marketing, operations, and R&D resources. Likewise, Capron and Hulland (1999) investigate how firms use key marketing resources after horizontal acquisitions and find that the mobility of a resource is critical to redeployment. Finally, other strategy research has shown that larger firm size (i.e., an aggregate reflection of resources) induces inertia and complacency (e.g., Hambrick and D'Aveni 1988), which consequently suggests ineffectiveness in deploying resources.

We extend this literature by arguing that firm-specific resources influence the effectiveness of a firm's actions. Specifically, by examining both resource possession and resource deployment in a single model, we investigate whether the level and type of accumulated firm resources influence the effectiveness of deployment. This approach contributes to the literature in several ways. First, we focus on the moderating effect of firm resources on the deployment–performance relationship, whereas most research in marketing strategy has tended to examine the main effect of resource levels on performance (e.g., Srivastava, Shervani, and Fahey 1998). Second, we suggest that the type of firm resource influences the deployment–performance relationship. This approach extends research from the resource-based view in marketing and strategy, which suggests that types of resources affect competitive advantage differently (e.g., Capron and Hulland 1999).

In this article, we examine three types of resources (i.e., intangible marketing resources, intangible technological resources, and financial resources) and predict different moderating effects on the deployment–performance relationship. Specifically, we argue that resource levels can have a negative or positive effect. Although it could be argued, for example, that larger, more resource-rich firms have more to deploy and therefore will always outcompete smaller rivals, we suggest that the level of resources can either diminish or increase the returns a firm can expect from deployment depending on the nature of the resource under consideration.

In the next section, we describe the concept of deployment in more detail and introduce a specific form we refer to as market deployment. We then present our conceptual framework, which examines the effects of a firm's intangible marketing resources, intangible technological resources, and financial resources on the returns a firm achieves from its deployment activities. Finally, we test our framework in the packaged-goods industry using sequentially estimated hierarchical regression models.

MARKET DEPLOYMENT

Although researchers in marketing and other disciplines have used the term "deployment" in various ways, one common theme suggests that deployment occurs when resources are put into action. *Resources* refer to the asset stocks owned by a firm and include, for example, brand equity or customer relationships (e.g., Srivastava, Shervani, and Fahey 1998). Explicitly adopting the external role of marketing, we define *market deployment* as the degree of action directed toward managing organizational resources in the marketplace. Market deployment is therefore found in actions that a firm takes to generate market response, which includes many traditional parts of the marketing mix, such as advertising, distribution, and promotion activities.

Some researchers working in the tradition of the resource-based view may prefer to classify market deployment as a capability. This view differentiates between resources and capabilities, where capabilities refer to processes and routines that a firm can perform well (i.e., generate brand equity or develop customer relationships) (e.g., Day 1994; Grant 1991). For example, market deployment as a capability is evident when a firm is good at managing a marketing-mix factor such as pricing (Dutta et al. 2002). Although many of the marketing-mix factors we study may be capabilities for the firms under consideration, we do not assume that market deployment is a capability; instead, we empirically estimate the effectiveness of market deployment by examining the relationship between market deployment and firm performance. This means that we limit our view of market deployment to a focus on actions that a firm takes to manage its resources in the marketplace.

To clarify the concept of market deployment further, we briefly discuss how it differs from related constructs in notable ways. First, market deployment is similar to resource allocation because both reflect the apportionment of resources, yet they contain important differences. Within the marketing strategy literature, resource allocation typically involves an apportionment of various firm resources to specific organizational functions (e.g., Walker and Ruekert 1987), whereas in sales-response models typically associated with marketing-mix research, resource allocation refers to apportionment of marketing investments to different products or submarkets (e.g., Mantrala, Sinha, and Zoltners 1992). In both cases, resource allocation occurs before market deployment. Specifically, resources are allocated to functions, regions, or products that may or may not be deployed. To assume that these two constructs are the same requires assuming that all allocated resources are always deployed, which we know is not the case from the literature on resource slack (e.g., Bourgeois 1981).

Second, although deployment reflects resource usage, resource utilization has historically focused on efficiency (e.g., Ruffin 1992). In contrast, market deployment focuses on the attainment of efficiency and effectiveness rather than solely on efficiency criteria. Moreover, an efficiency perspective tends to center on firm-specific explanations, such as internal coordination (e.g., Majumdar 1998), which fails to consider the effect of market factors on interfirm performance and the integration characteristics of market deployment. Finally, deployment is related to implementation in that both reflect the execution of actions. A process view of implementation focuses on underlying processes related to executing a strategy (e.g., Noble and Mokwa 1999) and includes such activities as negotiation, commitment, and achieving organizational buy-in. These behaviors may be important to deployment, but they do not necessarily address the market-performance component of market deployment.

CONCEPTUAL FRAMEWORK

Our conceptual framework examines the impact of a firm's accumulated resources on the effectiveness of its market deployment activities. Our focal prediction is that a firm's resource levels will have important second-order effects on the relationship between market deployment and performance, or what we refer to as *returns to market deployment*. That is, we expect accumulated resources to

influence the extent to which a firm's marketing-specific actions affect its performance. We begin by reviewing the literature and illustrating the direct relationships between firm resources and performance and between market deployment activities and performance. We then examine the moderating effect that accumulated resources have on returns to market deployment.

Direct Effects of Firm Resources and Market Deployment on Performance

Research from several domains points to the direct effects of accumulated resources and market deployment on firm performance. We briefly review each as a foundation for our focal relationship. First, it is customary to conceive of several categories of resources that might influence competitive advantage: financial resources (e.g., cash), physical resources (e.g., equipment), human resources (e.g., knowledge), intangible technological resources (e.g., patents, trademarks), intangible marketing resources (e.g., relationships, brand name), and organizational resources (e.g., corporate culture) (e.g., Grant 1991; Srivastava, Shervani, and Fahey 1998). In consideration of these different resource types, the resource-based view of the firm emphasizes firm-specific, difficult-to-imitate resources as a key source of competitive advantage (e.g., Barney 1991; Wernerfelt 1984). This view also emphasizes the importance of the size or level of a firm's resources to its performance success. For example, research suggests that a critical mass facilitates further resource accumulation (Dierickx and Cool 1989). Following this tradition, we expect a firm's accumulated resources to influence its performance.

Second, research from several domains illustrates a direct effect of a firm's marketing actions on its performance. For example, research shows that the deployment of general marketing expertise positively affects market share and profitability (Capron and Hulland 1999). Moreover, research on the effects of coupon magnitude indicates that higher coupon values may enhance sales for more knowledgeable consumers (Raghubir 1998) and enhance price inelastic brand sales (Bolton 1989). Similarly, research on other marketing-mix actions shows positive sales effects from distribution intensity (Frazier and Lassar 1996) and various promotional activities (e.g., Blattberg, Briesch, and Fox 1995). Given this research, we expect market deployment to have a significant effect on performance.

Moderating Role of Firm Resources on Returns to Market Deployment

We now consider an integrative view of accumulated resources, market deployment, and performance that contains our focal prediction and represents our key contribution. This view suggests that a firm's returns to market deployment depend on the type and level of its resources.

In examining the type and level of a firm's resources, we focus on intangible marketing resources, intangible technological resources, and financial resources. *Intangible marketing resources* refer to marketing-specific resources such as brand equity and customer relationships that are difficult to value and rarely appear on financial statements. As Srivastava, Shervani, and Fahey (1998) discuss, these resources arise from a firm's interaction with the market and have critical value to the firm. *Intangible technological resources* also possess the same intangibility feature, yet are tied more closely with R&D and refer to resources such as patents and trademarks. *Financial resources* refer to the cash or financial capital that an organization possesses.

Research across several disciplines points to three potential effects for the moderating role of accumulated resources on returns to market deployment: (1) no effect, (2) positive moderating effect, or (3) negative moderating effect. Although there may be several reasons for these different effects, we believe that these disparate patterns may be due to differences in the types of resources available for deployment. Therefore, we examine each of these three general effects and the characteristics of our focal resources to predict how they will moderate returns to market deployment.

Null effect. One school of thought suggests that market deployment achieves the same marginal return regardless of the level of accumulated resources. This view is widely held by researchers who examine econometric models of the short- and long-term effects of marketing actions on sales and profits (e.g., Mela, Jedidi, and Bowman 1998). There appears to be an underlying assumption in this area of research that response functions related to marketing actions are driven by market-related factors rather than by organizational factors. Therefore, most researchers working in this tradition do not examine the effect of firm resources. Other researchers working in this tradition difference away firm-level effects (e.g., Boulding and Staelin 1995), which removes the effects of observed and unobserved firm characteristics from their models. The implication of both of these approaches is that marketing-mix actions are examined outside the organizational context in which they occur.

Positive moderating effect. A positive moderating effect for accumulated resources on returns to market deployment suggests that firms with higher levels of resources attain greater returns from market deployment. This view is supported by research concerned with resource immobility and economies of scope. We examine each of these issues in turn.

First, in general, intangible marketing and technological resources are immobile resources. Immobile resources are highly firm specific, legally protected, and likely created as a function of more complex technical or social routines, such as interaction among scientists, new product development activities, market knowledge-management activities, or alliances with advertising agencies. Therefore, resources that are imperfectly immobile cannot be easily obtained, traded, imitated, or substituted (Barney 1991) and thus are idiosyncratic to the firm. In contrast, financial resources are less likely to arise from complex routines and are not specific to firms, which renders financial resources more mobile.

The value of immobility lies in three general isolating mechanisms. First, complex routines render a resource high in causal ambiguity (Lippman and Rumelt 1982), where the link between resources and competitive advantage lies behind a complex, nontransparent veil of underlying processes. Second, a resource can be rendered immobile when it is cospecialized and works well only in the presence of related resources. Third, resource immobility increases when environmental conditions no longer enable competing firms to develop or acquire the resource (Barney 1991). Resources that are imperfectly immobile offer positional barriers (Wernerfelt 1984), enabling a firm to sustain its relative position and enhance its effectiveness. This suggests

that when resources are immobile, they are likely to positively affect returns to market deployment.

A second reason that intangible marketing and technological resources may increase returns to market deployment is economies of scope, where a resource has the potential to be used multiple times because it is not consumed when it is deployed (e.g., Guiltinan 1993). That is, the deployment of brand equity or a patent does not necessarily diminish the level of resource available for other deployment opportunities. For example, a brand name may be extended to a new product line and could still be cobranded in an alliance with another firm. However, if brand equity is extended unwisely, the firm may have less brand equity available for other strategies. Nonetheless, prudent, consistent extensions should not dilute and may even reinforce the brand's core equity (Keller 1993). By the same logic, commercialization of a patent does not preclude additional uses for the patent in new or related ventures.[1] In contrast, financial resources have no potential for economies of scope. The spending of cash diminishes the level of resource available for further deployment.

Although we argue that intangible marketing and technological resources exhibit a positive effect as a result of their superior immobility and economies of scope, it is also likely they will exhibit diminishing marginal returns at higher levels of these resources. For example, several line extensions run the risk of diminishing returns from brand equity (e.g., Keller and Aaker 1992). Moreover, the value of technological stock depreciates, influencing the sustainability of its advantage (e.g., Dierickx and Cool 1989). Therefore, we expect the level of intangible marketing resources and the level of intangible technological resources to positively influence returns to market deployment and exhibit a pattern of diminishing marginal returns at higher levels of these types of resources.

H_1: The level of intangible marketing resources has a positive effect on returns to market deployment, with diminishing marginal returns.

H_2: The level of intangible technological resources has a positive effect on returns to market deployment, with diminishing marginal returns.

Negative moderating effect. A third school of thought argues for a negative moderating effect for accumulated resources on returns to market deployment, suggesting that firms with lower levels of resources attain greater returns from market deployment. This pattern focuses on the pitfalls associated with larger size and is supported by evolutionary theory and the entrepreneurship literature. In particular, researchers who examine organizational decline and failure find that firms with more resources often succumb to complacency or inertia (Hambrick and D'Aveni 1988). Furthermore, this literature argues that these resource-rich firms tend to suffer from coordination problems that make communication and decision making more difficult and error prone (e.g., Tornatzky and Fleischer 1990). We extend this literature by suggesting that these rigidity effects are likely to be associated with high levels of financial resources.

First, financial resources are a highly discretionary resource that can be deployed in many ways and toward multiple ends. In this way, they resemble put or call stock options as discussed in the option pricing literature (e.g., Dixit and Pindyck 1994). This flexibility has great value to firms; however, the downside of this flexibility is that it increases firm uncertainty. We argue that as the option value of a resource increases, there is an increasing likelihood that firms may become overloaded or paralyzed with information about how they should deploy the resource. In support of this view, research has shown that high levels of information reduce decision-making effectiveness (e.g., Huber and McDaniel 1986). We expect this flexibility and related uncertainty to be high for financial resources, given the almost unlimited number of options for deployment. Intangible marketing and technological resources have less inherent flexibility in how decision makers deploy them in the market. This suggests a negative effect for financial resources but not for intangible marketing or technological resources on returns to market deployment.

Second, financial resources are also likely to be intricately tied to formal decision making and evaluation. In particular, financial resources are continuously monitored to track firm performance (e.g., Lusch and Harvey 1994). As a result, fairly well-developed rules and procedures are likely to surround the accumulation and deployment of financial resources. This means that well-established procedures tend to occur automatically (Cohen 1991) and be relatively impervious to new information emanating from the environment (e.g., Leonard-Barton 1992). As a result, there is an increased likelihood that such rules and procedures will become rigid, which may lead to a negative effect of financial resources on returns to market deployment. Such rules are less likely to have rigidity-inducing effects for intangible marketing and technological resources, because they are more likely to be handled by certain areas within a firm, such as marketing or R&D, which may, on average, reduce the level of bureaucracy that develops around these resources. Although we expect that bureaucracy increases around brand equity as it grows (and as a firm seeks to protect it) and around patents as they accumulate (and as a firm seeks to commercialize them), we argue that they are less likely, on average, to exhibit rigidity-inducing effects because of the specialized formalities for decision making that surround their deployment.

Finally, research suggests that a negative moderating effect is likely to exhibit diminishing marginal returns from higher levels of financial resources. In particular, although firms with higher levels of financial resources may be less effective than their smaller competitors as a result of the rigidity-inducing effects previously described, higher levels of financial resources afford other benefits that may offset these negative returns. For example, firms with high levels of financial resources often have vertical bargaining power (Grant 1991) and may find it easier to spread fixed costs over a larger base (Chandler 1990), which may attenuate the rigidity-inducing effects and create marginally diminishing returns. Therefore, we expect the level of financial resources to negatively influence market deployment effectiveness and exhibit a pattern of diminishing marginal returns from higher levels of financial resources.

[1]Compared with intangible marketing resources, intangible technological resources may have greater potential for economies of scope. This is the case because brand equity may become diluted if it is extended too often (Keller and Aaker 1992).

Table 1
OVERALL SUMMARY OF DATA COMPOSITION

	Total	*Bacon*	*Ground Coffee*	*Cold Cuts*	*Hot Dogs*	*Pickles*	*Frozen Pizza*	*Rice*	*Salad Dressing*	*Yogurt*
Number of brands	168	24	15	22	28	12	14	16	22	15
Number of firms	40	8	6	9	9	8	8	10	10	11
Total N	69,835	8139	8319	9417	8843	2550	7360	8954	10,920	5333

H_3: The level of financial resources has a negative effect on returns to market deployment, with diminishing marginal returns.

METHOD

To test these predictions, we rely on secondary data rather than the survey techniques often used in marketing strategy research for several reasons. First, a secondary data approach affords us the opportunity to examine the longitudinal effect of market deployment on performance. As a result, we can make stronger claims about the causal impact of accumulated resources on returns to market deployment. Second, secondary data offer more objective measures of performance outcomes, accumulated resources, and market deployment actions. Third, reliance on secondary data is consistent with the approach used in marketing-mix research, which enhances the potential implications of these results toward that stream of research.

We examined market deployment actions at the brand level using scanner data. We selected this approach over examining market deployment at the business-unit level because secondary data about business-unit-level actions are virtually nonexistent.[2] Furthermore, we wanted to highlight the "market" in market deployment and therefore focused on marketing-specific actions undertaken by a firm, such as those related to the marketing mix. This focus enabled us to examine direct implications of market responses to marketing-specific actions. Finally, the accumulated resources for brand-level market deployment are the firm's resources. Thus, examining the predictions at the brand level offers us a microperspective of organizational routines and market deployment actions. In particular, we focused on a firm's accumulated resources that are available for its brands to deploy. However, an examination of the data at the brand level involves the assumption that brands with fewer (more) resources will act similarly to firms with fewer (more) resources. We have no reason to expect that this is not the case, and we leave this comparison for further research.

Overview of the Database

We constructed the database by integrating several sources of secondary data. To examine the effects of market deployment on performance, we obtained weekly scanner data from ACNielsen. Specifically, we collected weekly data for two years (1997 and 1998) for 168 brands across nine different product categories (bacon, cold cuts, frozen pizza, ground coffee, hot dogs, pickles, rice, salad dressing, and yogurt; see Table 1) and across six markets (Atlanta, Chicago, Dallas, Denver, Los Angeles, and New York). Because estimates based on market-level data can be biased when the underlying model is nonlinear (Christen et al. 1997), we collected data from two chains within each of the six markets.

To examine the moderating role of accumulated resources, we collected resource measures annually for 1997 and 1998 from multiple sources, including Compustat, Corporate Affiliations Plus, and the U.S. Patent and Trademark database. We selected the annual time horizon because it emphasizes the potential for change in market deployment over time given a relatively stable level of resources. This design is appropriate because it focuses on the impact of resources available at the time of deployment. We further explain this approach in our discussion of variable measures and validate it in our hierarchical model estimation.

Measures

Market deployment. Our measures of market deployment include two brand-level actions taken by a firm: distribution action and coupon activity.[3] We operationalized distribution action as the breadth and depth of a brand's distribution coverage, and we measured it using weekly distribution points, which is an ACNielsen-computed measure for distribution coverage. Distribution points reflect both the number of stockkeeping units (SKUs) for a brand distributed in the retail stores of a chain and the relative size of the stores in which the SKUs are sold. Specifically, a brand's distribution points are the product of the chain's overall market share (expressed as percent all commodity volume) and the average number of brand SKUs carried by the chain. For example, consider a brand carried by two different chains, each of which represents 30% of the market. If 11 of the brand's SKUs are deployed at Chain A and only 8 SKUs are deployed at Chain B, the brand would have 330 distribution points at Chain A and 240 distribution points at Chain B. Thus, the brand is more fully deployed at Chain A. We obtained this measure from the ACNielsen scanner-panel database at the brand and chain level.

We operationalized coupon activity as the degree of coupon intensity for a brand over time, and we measured it as the total coupon circulation multiplied by the effective

[2]This is because financial statements are reported at the overall firm level and not the strategic-business-unit level, though examining market deployment actions at the overall firm level is also difficult. For example, although some firms report advertising expenditures in their financial statements, it is not a requirement, and therefore many firms do not report it. An exception of annual data at the strategic-business-unit level is the PIMS database.

[3]Although pricing decisions are not effortless, it is unclear how to operationalize a price-based measure of market deployment. For example, some scholars may argue that a higher price reflects greater effort, whereas others may argue that a lower price reflects greater effort. Still others may argue that the frequency of changes in baseline price reflects effort, whereas others may argue that it actually requires little effort. Given these different perspectives, we decided not to use a price-based measure of market deployment but to include it as a covariate in the marketing-mix model (Equation 3). Furthermore, we did not use an advertising measure of market deployment, because fewer than 25% of the brands examined exhibited any form of television (43 of 168 brands) or print (34 of 168 brands) advertising.

face value of the coupons in week t. The effective face value of the coupons refers to the dollar value of the coupon offered per unit (e.g., a "buy 2 and save $1.00" coupon has an effective face value of $.50). This measure includes all coupons offered through newspaper vehicles that reach at least 5% of the households in a market. Within the ACNielsen scanner-panel database, Nielsen Media Research provides coupon data only at the market level. Therefore, we assumed that the probability of a brand's coupon exposure was independent of the chain shopped within that market.

Although these two measures of market deployment target the household, other measures of market deployment may be directed at retailers. For example, manufacturers frequently use trade promotions to encourage retail promotions such as feature advertisements and in-store displays. Unfortunately, measures of the amount of trade support manufacturers offered to the retail chain were not available. Therefore, we did not include retailer promotions as a measure of market deployment.

Accumulated resources. Per our predictions, we measured intangible marketing resources, intangible technological resources, and financial resources. To ensure the distinction between each resource and market deployment action, we focused on those measures of resources owned by the firm and available to the brand. We recognize that resources and deployment are intricately linked, given that market deployment cannot occur if resources are not available for deployment. In the next section, we discuss how we controlled for this relationship.

Intangible marketing resources reflect a firm's successful interaction with customers in building relationships and brands. We therefore measured intangible marketing resources as an overall score of brand equity using four factors: the number of a brand's line extensions, share of category requirements, price premium, and intangible value. We used these four factors because we believed they captured four aspects of brand equity Aaker (1991) specifies: brand associations, brand loyalty, perceived quality, and brand awareness, respectively.

We measured each of these four elements as follows: The number of a brand's line extensions reflects the flavors, sizes, or varieties of an existing brand, which we measured as the number of SKUs for each brand. Share of category requirements is a measure of customer retention (Bhattacharya et al. 1996), which we collected from Information Resources Inc. at the brand and annual levels. We measured price premiums, which are often associated with quality, as the annual average brand price divided by the annual average price of the product category. Finally, we measured intangible value using Tobin's Q, which reflects a firm-level estimate of brand equity (Chung and Pruitt 1994) that represents the value of intangible assets, and we calculated intangible value from the firm's annual financial statements. We then converted this measure to the brand level by multiplying the firm-level value by a conversion metric that reflected annual brand sales divided by annual firm sales. To measure overall brand equity, we used the standardized factor loadings from a confirmatory factor analysis to calculate the weighted sum from each factor.[4]

We operationalized intangible technological resources as the successful output from internal R&D processes (Grant 1991; Hall, Griliches, and Hausman 1986), and we measured it using a composite index derived from patent citations and patent depreciation. Patent citations reflect the importance or value of the technological resource and refer to the number of times a patent has been referenced in subsequent patents (Trajtenberg 1990). Because patents vary greatly in value, the use of patent counts is less informative than the use of patent counts weighted by citations. Thus, we first classified patents to ensure that we included only those patents relevant to the product category. In particular, we filtered patents to reflect only food-related patents, and then the first author and a graduate research assistant coded these for relevance to the product category. For example, Procter & Gamble owns brands in many product categories, yet a patent titled "coffee brewing method" would be considered relevant for the coffee product category and not for other product categories. Interrater reliability was 74% among the possible 664 food-related patents acquired by the firms in our sample, with disagreement resolved through discussion. We then collected data from the U.S. Patent and Trademark database for the number of times that each patent was cited.

Patent depreciation acknowledges that the value of a technological stock tends to depreciate over time (Dierickx and Cool 1989; Hall, Griliches, and Hausman 1986). Therefore, we depreciated the overall value of a patent over its legal life. We adopted a straight depreciation approach consistent with that used by Moorman and Slotegraaf (1999), in which the value of a patent's contribution declines at a constant rate each year. To capture a stable measure of technological resources, we examined patents produced over a three-year period, which is consistent with the work of Griliches and Mairesse (1984).[5] We used this multiyear approach because the number of patents produced in one year does not accurately reflect the patents available, nor does the level of patents produced in one year predict the level of patent production in subsequent years (Hall, Griliches, and Hausman 1986). We therefore calculated the composite index measure of intangible technological resources as follows:

$$(1) \qquad TR_i = \sum_{n=1}^{3} (d_{in}) \left[\sum_{p=1}^{m} (1 + C_{pin}) \right],$$

where TR_i refers to the intangible technological resources for brand i, d_{in} refers to the depreciation value for brand i for each of the three years, and C_{pin} refers to the number of patent citations of patent p for brand i for each of the three years.[6] We collected patent information from the U.S. Patent and Trademark Office (http://www.uspto.gov) and at a commercially housed Web site (http://www.delphion.com).

[4]The factor loadings associated with the four brand equity elements are number of line extensions (.840), share of category requirements (.106), price premiums (.001), and intangible value (.110).

[5]Sensitivity analysis on the number of years used to represent a stable measure of technological resources indicates similarity in the significance and direction of parameters for a two- or four-year measure, which indicates that results are invariant to time horizon.

[6]Intangible technological resources in 1998 reflect patents from 1996 through 1998, whereas intangible technological resources in 1997 reflect patents from 1995 through 1997. Over the 17-year patent life, the weights we used to calculate the level of technological resources were 1/17; that is, .8824 for n = 1, .9412 for n = 2, and 1.0 for n = 3.

We operationalized financial resources as the level of liquid assets accumulated by a firm, and we measured it using Jensen's (1986) measure of free cash flow. This measure reflects the excess cash not distributed to security holders as either interest or dividend payments and therefore available for deployment (e.g., Jensen 1986; Lehn and Poulsen 1989). We calculated the level of excess cash available for deployment as the prior year's operating income, after subtracting total income taxes, gross interest expense, and dividends paid in the prior year (Lehn and Poulsen 1989). We collected this measure from financial statements reported in Compustat at the firm level. To convert the level of financial resources to the brand level, we allocated firm-level resources to the brand in proportion to brand sales. To calculate the proportion, we divided each brand's annual dollar sales by the firm's annual dollar sales. To obtain the level of excess cash at the brand level, we multiplied the proportion by the annual level of cash at the firm level. This proportional allocation approach reflects selective investment to strengthen a product's position, which is often evaluated by its size or market share (e.g., Aaker 1998).

Performance. Our view of market deployment examines the link between a firm and the market. To capture the extent to which market needs have been met, we focused on customer responsiveness and measure performance as baseline sales volume. Baseline sales reflect the level of sales without trade support of the product through temporary price cuts, advertising features, or special displays (e.g., Abraham and Lodish 1993). The ACNielsen approach to calculate baseline sales uses exponential smoothing across nonpromoted weeks to eliminate the effect of retailer promotions, but it does not eliminate effects from factors such as distribution, manufacturer coupon offers, or baseline price. Thus, the use of a brand's baseline sales volume as the measure of performance controls for extraneous sales shocks due to trade promotion. We attained this measure from the ACNielsen scanner-panel database. In Table 2, we provide a summary of the measures used in the analysis and their intercorrelations.

ANALYSIS AND RESULTS

Because this research involves nested data (i.e., weekly market deployment observations for a brand are nested within the firm's accumulated resources), we used a hierarchical model approach so that each level is represented in a submodel. Specifically, we used a three-stage sequential hierarchical regression model. In the first stage, we examined the potential direct effects of accumulated resources on market deployment. In the second stage, we analyzed the sales responsiveness to market deployment over time, using only that portion of market deployment that was unexplained by accumulated resources. In the third stage, we examined the effects of accumulated resources on the parameters estimated in the second stage.

Returns to Market Deployment

Model estimation. To estimate the returns to market deployment, we were interested in isolating those returns attributed specifically to market deployment. In particular, it is likely that the level of market deployment is in part due to levels of accumulated resources. Therefore, to capture returns to market deployment not explained by resources, we aggregated deployment to an annual level in the first stage to account for these possible effects (because our resource measures are all at the annual level). Following Christen and colleagues (1997), we estimated a multiplicative model form to capture interrelationships. In this first stage of the sequential hierarchical regression, we regressed market deployment on accumulated resources as specified in the following equation:

$$(2) \qquad MD_{ij} = q_{0j}(IMR_i)^{q1j}(ITR_i)^{q2j}(FR_i)^{q3j}w_{ij},$$

where

MD_{ij} ≡ annual market deployment action j for brand i,
q_{hj} ≡ parameter h for market deployment action j,
IMR_i ≡ intangible marketing resources for brand i,
ITR_i ≡ intangible technological resources for brand i,
FR_i ≡ financial resources for brand i, and
w_{ij} ≡ disturbance term.

To estimate Equation 2, we performed a Chow test and found that 1997 and 1998 had unique parameters for distribution-related market deployment ($F_{3, 305} = 15.34$; $p < .01$) and for coupon-related market deployment ($F_{3, 305} = 9.95$; $p < .01$). We were not surprised by this because fluctuations in market conditions may affect the value of different resources and their effects on market deployment. Therefore, rather than pooling the data, we estimated Equation 2 separately for each year (i.e., 1997 and 1998).

Results indicate that accumulated resources influence market deployment actions directly, as both distribution-

Table 2
SUMMARY OF MEANS, STANDARD DEVIATIONS, AND CORRELATIONS OF KEY CONSTRUCTS

Construct	*Measure*	*Mean*	*Standard Deviation*	*1*	*2*	*3*	*4*	*5*	*6*
Performance									
1. Sales volume	Baseline sales	3978	9419	1.000					
Market Deployment									
2. Distribution actions	Distribution points	681.2	976.7	.697**	1.000				
3. Coupon activity	Coupon intensity	20.4	130.7	.047**	.065**	1.000			
Resource									
4. Intangible marketing	Brand equity index	4.3	2.9	.441**	.647**	.005**	1.000		
5. Intangible technological	Patent citation index	10.9	19.1	.105**	.132**	–.002	.162**	1.000	
6. Financial	Jensen's (1986) free cash	24.3	62.1	.477**	.477**	.001*	.482**	.514**	1.000

*$p < .10$.
**$p < .05$.

related actions (R^2 = .74 in 1997 and .59 in 1998) and coupon-related activities (R^2 = .06 in 1997 and .17 in 1998) are significantly related to resources. Specifically, distribution-related actions are positively influenced by intangible marketing resources (q_{11} = .546 and $p < .01$ in 1997; q_{11} = .671 and $p < .01$ in 1998) and financial resources (q_{31} = .409 and $p < .01$ in 1997; q_{31} = .334 and $p < .01$ in 1998) and negatively influenced by intangible technological resources (q_{21} = –.073 and $p < .10$ in 1997; q_{21} = –.031 and not significant [n.s.] in 1998). Coupon-related activities are positively influenced by intangible marketing resources (q_{12} = .035 and n.s. in 1997; q_{12} = .454 and $p < .01$ in 1998), intangible technological resources (q_{22} = –.078 and n.s. in 1997; q_{22} = .183 and $p < .05$ in 1998), and financial resources (q_{32} = .117 and $p < .05$ in 1997; q_{32} = .008 and $p < .10$ in 1998). Therefore, as we anticipated, this first stage was important in order to partial out the effect of resources on market deployment so that we could focus our investigation on the effects of market deployment not explained by accumulated resources.

We used the residuals from Equation 2 in the second stage, because they represent the level of market deployment not accounted for by accumulated resources. As in Equation 2, we used a multiplicative specification. This specification is important, because a multiplicative model assumes proportionally equal effects across chains; that is, because the chains differ in intercepts, an additive model would have the illogical implication that market deployment actions have equal additive effects on sales that vary between chains.

To control for potential extraneous effects on brand sales, we included several covariates in the model. First, we included price as a covariate to control for extraneous effects due to brand price. Specifically, we used baseline price, which is an ACNielsen-calculated measure that excludes price promotions. We used the price residual from the first stage of the model, because research has shown that firm size influences brand price (Tellis 1989), and therefore accumulated resource levels may influence brand price. Second, to control for competitor-level effects, we included three covariates to reflect average competitor distribution coverage, average competitor coupon activity, and average competitor price. Third, to account for potential differences from cost of materials that may vary across categories, we collected monthly Producer Price Index (PPI) data from the U.S. Bureau of Labor Statistics and included PPI data in the model for each product category. Finally, because we pooled data across chains, we also included chain-level indicator variables to capture any systematic differences across chains. We then estimated Equation 3 separately for each brand in each year (i.e., 1997 and 1998) to examine sales responsiveness of market deployment over time.

$$(3)\quad S_{ikt} = b_{0i}(D_{ikt})^{b1i}(C_{ikt})^{b2i}(P_{ikt})^{b3i}(CD_{ikt})^{b4i}(CC_{ikt})^{b5i}(CP_{ikt})^{b6i}(PPI_{it})^{b7i}\Pi_{\mathbf{k}}(\mathbf{M_k})^{\mathbf{b8i}}v_{ikt},$$

where

S_{ikt} ≡ baseline volume sales for brand i in chain k in week t,
b_{hi} ≡ parameter h for brand i,
D_{ikt} ≡ residual of distribution coverage from Equation 2 for brand i in chain k in week t,
C_{ikt} ≡ residual of coupon activity from Equation 2 for brand i in chain k in week t,
P_{ikt} ≡ covariate: residual price from Equation 2 for brand i in chain k in week t,
CD_{ikt} ≡ covariate: average competitive distribution coverage for brand i in chain k in week t,
CC_{ikt} ≡ covariate: average competitive coupon activity for brand i in chain k in week t,
CP_{ikt} ≡ covariate: average competitive price for brand i in chain k in week t,
PPI_{it} ≡ covariate: producer price index for brand i in week t,
$\mathbf{\Pi_k}$ ≡ vector of parameters for chain indicator variables for chain k;
$\mathbf{M_k}$ ≡ covariate: vector of chain indicator variables of chain k, and
v_{ikt} ≡ disturbance term.

Equation 3 results indicate that market deployment significantly influences sales, which confirms existing evidence (mean R^2 = .926; range of .124 to .999). Across brands, model results indicate that distribution actions have a positive effect on sales (mean b_1 = .771; range of –17.275 to 5.567; 93.3% with positive effect)[7] and coupon activity has a positive effect on sales (mean b_2 = .003; range of –.048 to .079; 93% with positive effect). Among the covariates, price has a negative effect on sales (mean b_3 = –1.40; range of –18.254 to 27.032; 62.9% with negative effect), whereas the effect of PPI is positive (mean b_7 = .001; range of –2.94 to 1.56; 69% with positive effect). Among competitive covariates, the effects of average competitor distribution coverage and coupon activity are positive (mean b_4 = 1.45; mean b_5= .002), and the effect of average competitor price is negative (mean b_6 = –.674). Although these results are not altogether surprising, they provide the foundation to examine the second-order moderating effects of accumulated resources.

Moderating Role of Firm Resources on Returns to Market Deployment

Model estimation. To examine the moderating effect of accumulated resource levels on returns to market deployment, we used a sequential hierarchical model approach (e.g., Bolton 1989; Hoch et al. 1995; Wittink 1977), where the response parameters of market deployment on sales from Equation 3 become the dependent variable in Equation 4. To control for extraneous effects, we included total number of people employed by the firm (e.g., Chandy and Tellis 2000) to account for the potential influence generally associated with overall firm effects. In addition, to control for the potential sales differences inherent in a brand, we included the brand's average annual sales as a covariate. Finally, because much of the marketing-mix literature has shown the potential for strong category effects, we included category indicator variables as well.

Our predictions of diminishing returns indicate the use of a nonlinear, monotonic functional form. Although market deployment changes over time, the independent variables in

[7]The asymmetric range in the parameter estimates is due to a few extreme cases. Specifically, there are two extreme cases for distribution actions (b_1 = –17.275 and –8.386), two for price (b_3 = 27.032 and 21.297), and four for PPI (b_7 = –2.940, –2.745, –2.321, and –1.959). We retained these extreme cases in the analysis to capture effects from the full range of our data.

Equation 4 remain stable during the year. Therefore, in this sequential approach, we estimated Equation 3 for each brand to derive own elasticities for each measure of market deployment across each of the two years of data. We then estimated Equation 4 using the unconstrained parameter estimates as the dependent variable, which resulted in three separate regressions (i.e., one for the distribution parameters, one for the coupon parameters, and one for the Equation 3 intercepts), with the same independent variables across equations in this final stage.

$$(4)\quad b_{ij} = \gamma_{0j} + \gamma_{1j}\log(IMR_i) + \gamma_{2j}\log(ITR_i) + \gamma_{3j}\log(FR_i) + \gamma_{4j}(F_i) + \gamma_{5j}(SA_i) + \boldsymbol{\Gamma}_{cj}(\mathbf{CT}_c) + u_{ij},$$

where

b_{ij} ≡ market deployment j sales-response parameter for brand i;
γ_{hj} ≡ parameter h for market deployment j;
IMR_i ≡ intangible marketing resources for brand i;
ITR_i ≡ intangible technological resources for brand i;
FR_i ≡ financial resources for brand i;
F_i ≡ covariate: number of employees of firm that owns brand i;
SA_i ≡ covariate: average annual sales for brand i;
$\boldsymbol{\Gamma}_{cj}$ ≡ vector of parameters for category indicator variables for category c;
$\mathbf{CT}_c$ ≡ covariate: vector of category indicator variables for category c;
j ≡ 0 for the intercept, 1 for distribution, and 2 for coupon; and
u_{ij} ≡ disturbance term.

Because the dependent variable is an estimate of market deployment elasticities, to produce efficient estimates of model coefficients, we weighted the data by dividing the dependent and independent variables by the standard error of the market deployment coefficients derived from Equation 3 (see Wittink 1977). Following this, we used ordinary least squares to estimate Equation 4 for each of the two measures of market deployment.[8] Furthermore, to capture insight into the direct effect of accumulated resources on sales, we used the intercept from Equation 3 as the dependent variable in Equation 4.

[8]As one anonymous reviewer pointed out, other alternatives to estimating our model, such as feasible generalized least squares, may have provided a more efficient approach, yet the noise in our measures likely outweighs any gains from more sophisticated estimation procedures.

Although we control for several factors that may influence the relationship between accumulated resources and returns to market deployment, there are likely other factors that are subsequently captured in the disturbance term in Equation 4. For example, although the use of a family branding approach may be partially captured in our measure of intangible marketing resources and strategic variables such as order of entry (e.g., Bowman and Gatignon 1996) may be partially captured in our measure of intangible technological resources, resources such as these that are not directly measured in this model are primarily captured by the disturbance term.

Results

Equation 4 results indicate that the nonlinear, monotonic functional form provides a reasonably good fit for returns to distribution-related market deployment ($F_{13, 280} = 56.86$; $p < .01$; adjusted $R^2 = .71$) and coupon-related market deployment ($F_{13, 87} = 2.295$; $p < .05$; adjusted $R^2 = .14$). We also benchmarked this specification against two alternative functional forms: a linear specification and a nonlinear, nonmonotonic (i.e., quadratic) specification. Chow test results indicate that the quadratic specification provides a significantly better fit of the data than does the linear model for distribution-related market deployment ($F_{3, 240} = 35.98$, $p < .01$) and coupon-related market deployment ($F_{3, 84} = 2.13$; $p < .10$). This evidence mitigates concern that the diminishing return aspect of the nonlinear, monotonic specification is simply due to the constraint imposed by the functional form. Furthermore, our use of a nonlinear, monotonic specification is based on theoretical grounds, though the slight increase in fit of the nonlinear, monotonic specification over the quadratic specification (see Table 3) offers some support for diminishing marginal effects versus the inverted U-shaped relationship the quadratic form implies.

Intangible marketing resources (H_1). Results indicate that intangible marketing resources exhibit positive, diminishing marginal effects on returns to distribution-related market deployment ($\gamma_{11} = .281$; $p < .01$) and on returns to coupon-related market deployment ($\gamma_{12} = .003$; $p < .05$), which is consistent with H_1 (see Table 4). Therefore, a brand's equity influences the effectiveness of deployment actions. In particular, although brands with less accumulated intangible marketing resources attain lower returns, brands with moderate to high levels of these resources attain higher returns to distribution- and coupon-related market deployment.

Intangible technological resources (H_2). As shown in Table 4, results indicate that the level of accumulated intangible technological resources has a positive, diminishing

Table 3
COMPARISON OF MODEL SPECIFICATION

	Returns to Distribution			*Returns to Coupons*		
	Linear	*Quadratic*	*Log*	*Linear*	*Quadratic*	*Log*
Overall Model						
F statistic	24.52***	35.28***	56.86***	1.59	1.75*	2.29**
R^2	.57	.70	.73	.19	.25	.26
Adjusted R^2	.54	.68	.71	.07	.11	.14
Degrees of freedom (model, error)	13, 280	16, 277	13, 280	13, 87	16, 84	13, 87

*$p < .10$.
**$p < .05$.
***$p < .01$.

Table 4
EXPLANATORY ROLE OF ACCUMULATED RESOURCES ON MARKET DEPLOYMENT RETURNS
(PARAMETER ESTIMATES)

	Hypothesized Sign	*Returns to Distribution*	*Returns to Coupons*	*Direct Effect on Sales*
Predictor Variables				
ln(Intangible marketing resources)	+	.281***	.003**	.151
ln(Intangible technological resources)	+	.047***	.000	.002
ln(Financial resources)	–	–.112***	–.001*	–.553***
Control Variables				
Number of employees in firm		.004	–.002	.002
Average annual brand sales		–.000	–.000	.000***
Category indicator 1		–2.076	.465	1.679*
Category indicator 2		–1.581	.765	3.163***
Category indicator 3		–3.765*	.305	2.452***
Category indicator 4		–2.873	.441	.715
Category indicator 5		–3.602*	.617	2.593**
Category indicator 6		–1.573	.751	1.207
Category indicator 7		.288	2.141*	.386
Category indicator 8		–3.739*	.253	–.438
Overall Model				
Adjusted R^2		.712	.143	.223
F statistic		56.86***	2.29**	7.46***
Degrees of freedom (model, error)		13, 280	13, 87	13, 280

*$p < .10$.
**$p < .05$.
***$p < .01$.

marginal effect on returns to distribution (γ_{21} = .047; $p <$ .01). These results support H_2. The effect of intangible technological resources supports the predicted direction of effects for returns to coupon-related market deployment; however, these effects are not significant (γ_{22}, n.s.) and do not support H_2.[9] Thus, firms with a strong level of accumulated technological resources should expect greater returns if they direct their efforts toward distribution actions rather than the use of coupons for their brands.

Financial resources (H_3). Results indicate that the level of financial resources has a negative, diminishing marginal effect on returns to distribution-related (γ_{31} = –.112; $p < .01$) and coupon-related (γ_{32} = –.001; $p < .10$) market deployment. Therefore, the level of accumulated financial resources influences the effectiveness of market deployment actions. Specifically, returns to distribution and coupon deployment appear to be highest for brands with less financial resources, in support of H_3. This suggests that firms with more accumulated financial resources are less effective in their distribution and coupon activity, potentially as a result of the tangibility or rigidity-inducing effects of financial resources.

Comparison of firm resource effects. Figures 1 and 2 depict the relationships between accumulated firm resources and returns to market deployment.[10] Both figures show that intangible marketing resources enhance returns to deployment, and this effect is most dramatic at lower levels of resources. For example, consider three brands in our sample with different levels of intangible marketing resources. Brand A has fairly weak brand equity (2.6 weighted brand equity score [WBES]),[11] Brand B has somewhat stronger brand equity (3.0 WBES), and Brand C has very strong brand equity (13.5 WBES). Consistent with our expectations, Brand B's return to distribution deployment is 1.5 times that of Brand A; Brand C attains the highest, though diminished, return, at 3.2 times that of Brand A (see Figure 1).

As with intangible marketing resources, the effects of financial resources on returns to deployment are most marked at lower resource levels. To illustrate the difference in returns for distribution and coupon deployment for brands with different levels of financial resources, consider Brand D with $4 million and Brand E with $399 million. Although Brand D's return is 4.9 times that of Brand E for distribution deployment, it is only 2.1 times that of Brand E for coupon deployment (see Figures 1 and 2). The difference between returns for distribution and those for coupon deployment is also marked for intangible technological resources, where Brand F has more than 6 times the level of intangible technological resources as Brand G (61.9 versus 10.1 patent stock) and attains 2.6 times the returns for distribution and only 1.4 times the returns for coupon (see Figures 1 and 2).

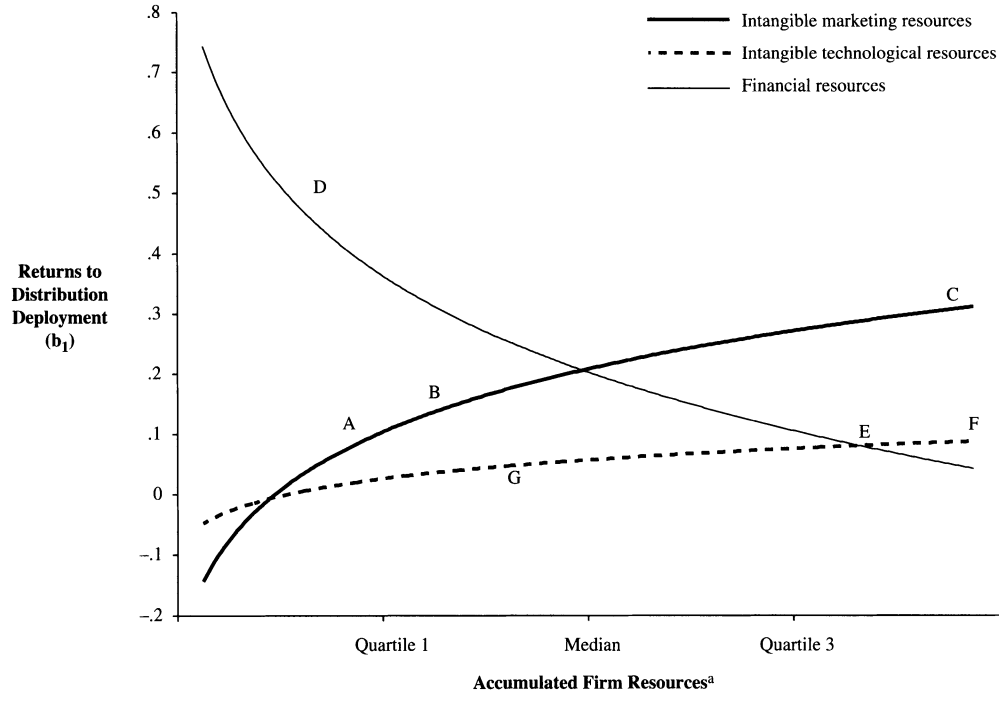
Direct effect of resources on sales. As we previously indicated, although we do not focus on predicting a relationship

[9]It is possible that this insignificant effect is partially a result of low power, given that only approximately half the brands in our sample offered coupons during the period examined.

[10]The results should not be generalized beyond the range of independent variables examined here. The ranges for each of the resources examined are intangible marketing resources (.082 to 13.942), intangible technological resources (0 to 88.825), and financial resources (0 to .604).

[11]This weighted score is based on our overall measure of brand equity, which we calculated from the standardized factor loadings from confirmatory factor analysis as previously described.

Figure 1
THE EFFECT OF FIRM RESOURCES ON RETURNS TO DISTRIBUTION DEPLOYMENT



[a]The results should not be generalized beyond the range examined here, which is intangible marketing resources (.082 to 13.942), intangible technological resources (0 to 88.825), and financial resources (0 to .604).

Notes: Letters represent different brands. For example, Brand A has fairly weak brand equity (2.6 WBES), Brand B has somewhat stronger brand equity (3.0 WBES), and Brand C has very strong brand equity (13.5 WBES). For financial resources, Brand D has $4 million, and Brand E has $399 million. To illustrate effects of intangible technological resources, Brand F has a high level of patent stock (61.9), whereas Brand G has a moderate level of patent stock (10.1).

between resources and sales, research from the resource-based view of the firm indicates that such a relationship exists. As an ancillary investigation of this relationship, we used the intercepts from Equation 3 as the dependent variable in Equation 4 to determine the effects of resources on sales. Results from this analysis indicate that the level of financial resources has a significant, negative effect on sales ($\gamma_{30} = -.553$; $p < .01$) and that the effects of intangible marketing and technological resources are not significant (see Table 4). Therefore, as the resource-based view predicts, resources exert a direct effect on sales, yet these results further suggest that the main impact of resources is through their effect on deployment (revealed in the first stage of our analysis) and their effect on returns to deployment (revealed in the third stage of our analysis).

DISCUSSION

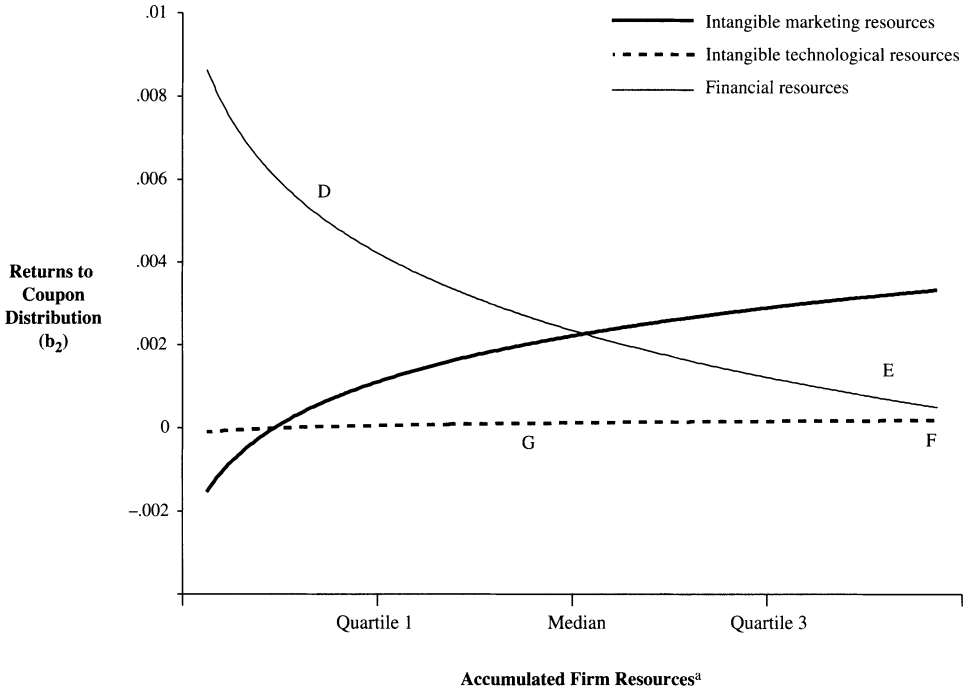
To this point, the interdisciplinary literature on competitive advantage has focused on how the possession of resources or their deployment affects performance. In addition to these effects, we suggested and found that a firm's resources have important second-order effects on performance by influencing how effectively the firm deploys its resources. These findings have several implications. First, we supplement the current perspective in resource-based research by finding that resource possession influences the effectiveness with which resources are deployed. Second, we offer insight to the marketing-mix literature by illustrating that performance returns to marketing actions are influenced by organizational factors, such as levels of accumulated resources. Third, for marketing strategy researchers, our results reaffirm that firm resources are important, but they also challenge researchers to include a greater emphasis on the role of resource deployment in competitive advantage.

How Resources Affect Market Deployment Effectiveness

As we anticipated, and consistent with prior research, results show significant sales returns to market deployment. However, more worthwhile are the significant effects of accumulated resources on returns to market deployment. This supports our argument that organization-level factors can influence the effectiveness of market deployment actions.

We find that returns to distribution- and coupon-related market deployment are enhanced when fewer rigidity-inducing resources exist. Specifically, financial resources reflect a flexible strategic option that can be deployed toward many ends. As a result, we suspect that managers who have high levels of financial resources suffer under the weight of uncertainty and associated information overload. In contrast, when fewer financial resources are available,

Figure 2
THE EFFECT OF FIRM RESOURCES ON RETURNS TO COUPON DEPLOYMENT



[a]The results should not be generalized beyond the range examined here, which is intangible marketing resources (.082 to 13.942), intangible technological resources (0 to 88.825), and financial resources (0 to .604).

Notes: Letters represent different brands. For example, Brand D has $4 million, and Brand E has $399 million. To illustrate effects of intangible technological resources, Brand F has a high level of patent stock (61.9), and Brand G has a moderate level of patent stock (10.1).

managers heighten their attentiveness to the market and focus on maximizing the returns associated with a more focused set of strategies. In addition, given the link between financial resources and many organizational processes, we suggest this resource will become more rigid in administration and therefore less responsive to emerging market trends. As a result, financial resources exert a negative effect on returns to market deployment.

We also find that returns to market deployment increase in the presence of more intangible and immobile resources. Specifically, higher levels of intangible marketing and technological resources exhibit higher returns to market deployment. These findings support arguments within resource-based theory, proponents of which argue that possessing difficult-to-imitate resources enhances performance (e.g., Barney 1991). However, these findings also extend the resource-based literature by demonstrating that resources are not only a direct predictor of performance but also a moderator of returns to market deployment.

For intangible marketing resources, increasing levels of brand equity improve the returns to distribution and coupon deployment. In other words, increases in brand equity enable firms to extract greater returns for each unit of distribution or coupon activity. In light of concerns about diluting brand equity, this finding puts the brand manager in a bit of a dilemma. On the one hand, leveraging of brand equity promises greater returns. On the other hand, leveraging of brand equity in couponing or distribution has the potential to threaten the stock of brand equity available for future deployment activities, if extensions are made without regard to the brand's core equity. Therefore, managers need to balance the short-term gains in returns from market deployment with the longer-term threats to brand equity.

With respect to intangible technological resources, increasing resource levels improves the returns to distribution deployment. Accumulated technological resources likely reflect a firm's commitment to innovation and new product development. Therefore, intangible technological resources improve returns to distribution deployment by increasing the likelihood that the firm is distributing innovative products, which generates greater returns. Conversely, technology resources have no effect on returns to coupon deployment. This is likely due to the lack of strategic connection between accumulated technological resources and the effect of coupons in the marketplace. In particular, it is possible that for firms with higher levels of technological resources, consumers are less knowledgeable about the reference price for the products, which therefore affects coupon evaluation and redemption (Raghubir 1998).

We also recognize that there may be synergies among resources. To explore whether any synergies among resources influence market deployment returns, we examined three different two-way interactions within the third stage of the hierarchical regression approach. Results from this analysis indicate that only the interaction between intangible technological resources and financial resources has a significant, negative influence on returns to coupon deployment ($\gamma = -.002$; $p < .05$) but not a significant influence on returns to distribution deployment ($\gamma = .011$; n.s.). Therefore, although the level of intangible technological

resources does not show a significant main effect on returns to coupons, higher levels of intangible technological resources coupled with higher levels of financial resources decrease the effectiveness of coupon activity, which points to the rigidity-inducing effects associated with financial resources. Given the lack of other interactions, the independent effects of the resources appear to be the critical effects on returns to market deployment.

Contributions to the Resource-Based View of the Firm

The resource-based view of the firm includes the notion of deployment, but empirical research in this domain is scarce. Therefore, our findings supplement strategy research's emphasis on the accumulation, combination, or possession of resources (e.g., Dierickx and Cool 1989; Wernerfelt 1984). We find that though resource possession influences the level of market deployment action, accumulated resources also influence the effectiveness with which resources are deployed. Therefore, further resource-based research should consider not only the effects of resource possession but also the effects of resource deployment. More important, further research in this tradition should also account for how resource types and levels influence how effectively resources are deployed.

Furthermore, although the resource-based view of the firm perceives the firm as a bundle or pool of resources (e.g., Wernerfelt 1984), our analysis offers a perspective at the brand or product level while controlling for other firm-level factors. Moreover, our results indicate that brand-level resources continue to influence the effectiveness of market deployment, even when we control for overall firm-level effects. This distinction directs resource-based approaches to consider various units of analysis from which organizational resources can be examined (e.g., brand, strategic business unit, organization).

Contributions to Marketing-Mix Research

We offer insight to marketing-mix research by illustrating that organization-level factors can influence returns to marketing efforts. Therefore, in addition to examining the competitive effects (e.g., Cooper 1988), market-level factors (e.g., Bolton 1989), and combined effects of multiple marketing efforts (e.g., Christen et al. 1997) on performance, research should also consider the role of organization-level effects. The potential for differential returns suggests an underlying complex relationship between marketing-specific actions and returns to those actions that may be further understood by incorporating the role of organizational resources into marketing effort models.

Our results indicate different effects for various types of firm resources, suggesting that research should consider modeling the effect of resources separately. The approach to control for firm-level differences through fixed effects removes both observed and unobserved firm differences. However, this approach does not provide the opportunity to examine the complex relationship among firm resources, firm actions, and firm returns. As our findings suggest, these relationships indicate that marketing actions taken within the context of organizations with varying characteristics can expect to achieve different returns.

For example, consider distribution intensity research. Frazier and Lassar (1996) show that factors such as retailer commitments, manufacturer brand strategy, and channel practices influence returns to distribution intensity. In our research, we extend this set of factors to include the role of organizational resources. Specifically, we illustrate that the level of a firm's financial resources can decrease returns to distribution intensity whereas the level of a firm's intangible technological resources can increase returns to distribution intensity. These findings provide further aid for managers to assess the value of different distribution strategies.

Contributions to Marketing Strategy Research

Delineation of firm resources from market deployment affords the opportunity to examine how resources and deployment influence firm performance jointly and independently. We argue that this advancement improves our ability to understand how firms attain and sustain competitive advantage by developing and deploying resources of different types and levels. Although prior research has examined, for example, the effects of market orientation on competitive advantage (e.g., Jaworski and Kohli 1993), it also has emphasized possessing a market orientation as a valuable firm-level resource. We find that various firm-level resources and marketing-specific actions interrelate in complex ways to influence competitive advantage.

These findings support a growing appreciation of firm-level differences in the field of marketing. Although research has provided insight into the nature and effects of firm differences on market and business performance, research has not examined how firm differences affect marketing actions directly or how they moderate the effect of marketing actions on market performance. Our research theorizes and tests both of these impacts. As such, we hope this research encourages marketing strategy researchers to continue their investigation into how the firm context influences marketing.

This research also emphasizes the value of intangible marketing and technological resources in the effectiveness of marketing efforts. Researchers emphasize the value of brand reputation and brand equity as a key source of competitive advantage (e.g., Keller 1993) as well as the importance of the complementary role of technology capabilities to marketing capabilities (e.g., Moorman and Slotegraaf 1999). Our research further supports these perspectives by illustrating that brand equity and technological patents influence the effectiveness of marketing actions.

Finally, this research suggests that what is critical is not necessarily what firms own but what firms do with what they own. Specifically, this research shifts the emphasis from strictly *acquiring* resources to *deploying* the resources possessed. As a result, smaller firms are not doomed to failure because of a lower level of accumulated resources. Instead, our results suggest that deployment can produce greater returns, thereby enabling smaller firms to survive and grow over time. Therefore, this research offers initial insight for firm decisions about not only the importance of the allocation of current resources but also the value of the market deployment of those resources. This emphasis may also shift education and practice toward a better understanding of the individual and organizational factors that appear to drive successful deployment.

Current Limitations and Further Research

Our intention is not to offer an all-inclusive view of the relationship among firm resources, market deployment, and their joint influence on performance. Instead, our primary

goal is to argue for the importance of examining the combined roles of market deployment and firm resources and to offer initial insight to support this argument. Given the results, we achieved this goal. In the following discussion, we suggest various avenues for further research and tie these suggestions to the potential limitations of this research.

First, additional levels of analysis should be examined. The level of analysis used in this research offers initial insight into the effects of market deployment and accumulated resources. Although firms that offer multiple brands also provide various levels of resources to those brands, the actual variability of resource levels remains driven by the firm. The number of firms represented in this research, though substantial for the consumer packaged-goods industry, is not extensive and was influenced by the public availability of data.[12] To capture greater variability in market deployment behavior and levels of resources, further research should examine the effects at various levels of analysis, such as the strategic business unit or overall organization.

Second, various industries should be examined. Our research focused on the consumer packaged-goods industry. Other industries may illustrate either stronger or weaker differential returns to market deployment based on accumulated resource levels. For example, the services marketing literature emphasizes the importance of the actual service experience, which is highly dependent not only on the actions of frontline employees but also on a firm's resources, such as its physical surroundings. Thus, service industries might offer a rich context to examine the complex relationships among firm resources, market deployment, and performance outcomes.

Third, an important avenue for further research is the examination of additional measures of resources, market deployment, and performance. Our approach focused on secondary measures, but there are limitations to our data set. For example, we examined resources at the brand level, at which, for example, the type of line extension (e.g., new flavor, new package size) may influence the effects of intangible marketing resources. In addition, our measures of market deployment focused on those under the manufacturer's control; however, other measures of market deployment are likely to provide rich insight. For example, our sample precluded the use of advertising as a measure of market deployment because too few of the brands in our sample exercised this form of market deployment. Other measures of market deployment that are under the control of the retailer would provide needed insight, given the role of resource possession and deployment at the manufacturer and retail levels. For example, in the packaged-goods industry, the retailer rather than the manufacturer is the primary decision maker when it comes to pricing decisions, which thus involves deployment and resource possession at the trade level. Moreover, our data set did not include trade promotional activity measures, and thus we were unable to account for any potential relationship between trade promotional activity and distribution.

Although a secondary data approach enables the use of objective measures, proxies were required to measure the level of accumulated resources and market deployment. Other measures of resources, such as intellectual capital or trading relationships, should be considered. Moreover, to capture an overall market deployment level, other measures are needed, because our measures of market deployment precluded an index measure. For example, use of expenditures as a proxy for market deployment enables the combination of various types of activities (because all would be based on dollars spent); however, it may bias results regarding the relationship between market deployment and financial resources. A different measure of market deployment, one that occurs at a broader level, should be explored to offer additional insight. Therefore, further research should extend beyond the use of secondary data by capitalizing on measures afforded through primary data, such as organizational culture, employee knowledge, and organizational profit.

Finally, our use of a nonlinear, monotonic specification over a quadratic specification was based on theoretical grounds rather than empirical grounds (i.e., model fit). Although the nonlinear, monotonic specification provided a slightly better fit than the quadratic specification, the two yielded a fairly similar fit. Research that empirically tests whether the effects of certain resources exhibit U-shaped returns to market deployment rather than diminishing marginal returns would offer additional insights.

Overall, the value to be gained from incorporating both a resource and a deployment perspective to the examination of competitive advantage may be determined by access to specific firm-level information. In particular, to procure the insight gained from incorporating a resource perspective into market-response models, manufacturers and retailers should consider providing scholars access to their information on firm resources. This would enable further assessment of the potential effects of firm resources on returns to marketing-mix effects estimated from conventional data sources.

[12]We examined only brands from publicly available data. This included brands from publicly traded firms and brands from privately held firms that publish their financial statements.

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