

THE ROLE OF FIRM RESOURCES IN RETURNS TO MARKET DEPLOYMENT

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Abstract

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*. We suggest that neither of these approaches by itself fully captures the drivers of competitive advantage. Focusing on marketing-specific actions we refer to as market deployment, we investigate the roles of *both* resources and action by examining how the success of a firm's marketing actions is influenced by the nature and level of its resources. Based on a secondary data approach and a series of sequentially-estimated hierarchical regression models, results indicate that resource possession influences the 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.

INTRODUCTION

Strategy researchers exalt organizational resources as key 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 adopting 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. Researchers in marketing, for example, have investigated brand-level marketing actions such as pricing (e.g., Hoch et al. 1995), coupon activity (e.g., Raghurir 1998), promotional efforts (e.g., Blattberg, Briesch and Fox 1995), and distribution coverage (e.g., Reibstein and Farris 1995). While 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, however, appear to implicitly assume that firm resources are either 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' initial resource-poor status resulted in its design of market-driven strategies that enabled it to achieve great success and grow 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 et al. (2001) illustrate the

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

Notwithstanding these important contributions, we extend this literature by arguing that the effectiveness of a firm's actions is influenced by its firm-specific resources. Specifically, we investigate whether the level and type of accumulated firm resources influences the effectiveness of deployment by examining *both* resource possession and resource deployment within a single model. 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 et al. 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 suggesting that types of resources affect competitive advantage differently (e.g., Capron and Hulland 1999).

In this paper, 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. While one could argue, for example, that larger, more resource-rich, firms have more to deploy and so will always out-compete 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.

The next section describes the concept of deployment in more detail and introduces 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 et al. 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. This includes, of course, many traditional parts of the marketing mix such as advertising, distribution, and promotion activities.

Some researchers working within the tradition of the resource-based view might prefer to classify market deployment as a capability. This view differentiates between resources and capabilities, with capabilities referring 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). While 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 further clarify the concept of market deployment, we briefly discuss how it differs from related constructs in important ways. First, market deployment is similar to resource allocation since 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 which may or may not be deployed. To assume that these two constructs are the same would assume 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, while deployment reflects resource usage, resource utilization has historically focused on efficiency (e.g., Ruffin 1992). Market deployment, on the other hand, focuses on 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 inter-firm 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. While these behaviors may be important to deployment, 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, accumulated resources are expected to influence the extent to which a firm's marketing-specific actions impact its performance. We begin by reviewing the literature illustrating the direct relationships between (a) firm resources and performance and (b) market deployment activities and performance. Following this, we examine the moderating effect that accumulated resources have on returns to market deployment.

The 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 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 et al. 1998). Considering 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. Research suggests, for example, that a critical mass facilitates further resource accumulation (Dierickx and Cool 1989). Following in 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. Research shows, for example, 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 Lasser 1996) and various promotional activities (e.g., Blattberg et al. 1995). Given this research, we expect market deployment to have a significant effect on performance.

The 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 discussed by Srivastava et al. (1998), 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 this category of resources is tied more closely with R&D and refers to resources such as patents and trademarks. *Financial resources* refer to the cash or financial capital that an organization possesses.

Across several disciplines, research 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. While there may be a number of 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. This school of thought suggests that market deployment has 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-term and long-term effects of marketing actions on sales and profits (e.g., Mela et al. 1998). There appears to be an underlying assumption within 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 in turn.

First, intangible marketing and technological resources are generally considered to be immobile resources. Immobile resources are highly firm-specific and legally protected and are likely to be 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 are thus idiosyncratic to the firm. In contrast, financial resources are less likely to arise from complex routines and are not specific to firms, rendering financial resources more mobile.

The value of immobility lies in three general isolating mechanisms. One, complex routines render a resource high in causal ambiguity (Lippman and Rumelt 1982), where the link between resources and competitive advantage lie behind a complex, nontransparent veil of underlying processes. Two, a resource can be rendered immobile when it is cospecialized and works well only in the presence of related resources. Three, 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 impact 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 since it is not consumed when it is deployed (e.g., Guiltinan 1993). That is, when brand equity or a patent is deployed, it 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 it could still be co-branded in alliance with another firm. Of course, if brand equity is extended unwisely, the firm may have less available for other strategies. However, prudent, consistent extensions should not dilute and may even reinforce the brand's core equity (Keller 1993). Using the same logic, commercialization of a patent does not preclude additional uses for the patent in new or related ventures.¹ Financial resources, on the other hand, have no potential for economies of scope. When cash is spent, it diminishes the level of resource available for further deployment.

Although we argue that intangible marketing and technological resources exhibit a positive effect due to their superior immobility and economies of scale, it is also likely they will exhibit diminishing marginal returns at higher levels of these resources. For example, numerous 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, following from this research, we expect the level of intangible marketing resources and the level of intangible technological resources to each positively influence returns to market deployment, exhibiting a pattern of diminishing marginal returns at higher levels of these types of resources.

H₁: The level of intangible marketing resources has a positive effect on returns to market deployment, with diminishing marginal returns.

H₂: 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 examining organizational decline and failure find that firms with more resources often succumb to complacency or inertia (Hambrick and D'Aveni 1988). Further, 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 for the following reasons.

First, financial resources are a highly discretionary resource that can be deployed in numerous 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, of course, has great value to firms. The downside of this flexibility, however, 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 regarding 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 will 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 will 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, since 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. While we expect that bureaucracy will increase around brand equity as it grows (and a firm seeks to protect it) or around patents as they accumulate (and a firm seeks to commercialize them), we argue that they are less likely, on average, to exhibit rigidity-inducing effects due to the specialized formalities for decision-making surrounding 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, while firms with higher levels of financial resources may be less effective than their smaller competitors due to 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). Firms with a high level of financial resources may also create autonomous business units to create an organizational climate that reduces bureaucratic inertia and enhances the firm's responsiveness to marketplace changes (Chandy and Tellis 2000). Overall, these strategies offer the potential to offset rigidity-inducing effects, thus illustrating marginally diminishing returns in the effects of financial resource levels. Therefore, we expect the level of financial resources to negatively influence market deployment effectiveness, exhibiting a pattern of diminishing marginal returns from higher levels of financial resources.

H₃: 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 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 examine market deployment actions at the brand level using scanner data. This approach was selected over examining market deployment at the business unit level because secondary data about business unit level actions is virtually non-existent.² Further, we sought to highlight the “market” in market deployment so we focused on marketing-specific actions undertaken by a firm, such as those related to the marketing mix. This focus allowed 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 a micro-perspective of organizational routines and market deployment actions. In particular, we focus on a firm’s accumulated resources that are available for its brands to deploy. Examining the data at the brand-level, however, involves the assumption that brands with fewer (more) resources will act similar to firms with fewer (more) resources. We have no reason to expect this to not be the case and leave this comparison for future research.

Overview of the Database

The database was constructed by integrating several sources of secondary data. To examine the effects of market deployment on performance, weekly scanner data was obtained from A.C. Nielsen. This portion of the database consists of weekly, brand-level data from nine product categories, for 12 chains, within a period of 104 weeks (see Table 1). Specifically, weekly data were collected 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) and across six markets (Atlanta, Chicago, Dallas, Denver, Los Angeles, and New York). Since estimates based on market-level data can be biased when the underlying model is non-linear (Christen et al. 1997), two chains within each of the six markets were selected.

Insert Table 1 here

To examine the moderating role of accumulated resources, resource measures were collected annually for 1997 and 1998 from multiple sources, including Compustat, Corporate Affiliations Plus, and the U.S. Patent and Trademark database. The annual time horizon was selected 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. This approach is further explained in our discussion of variable measures and is validated in our hierarchical model estimation.

Measures

Market Deployment. Our measures of market deployment include two brand-level actions taken by a firm: distribution actions and coupon activity.³ Distribution actions are operationalized as the breadth and depth of a brand's distribution coverage and are measured using weekly distribution points, which is an A.C. Nielsen-computed measure for distribution coverage. Distribution points reflect both the number of stock keeping 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 is the product of the chain's overall market share (expressed as percent ACV) and the average number of brand SKUs carried by the chain. For example, consider a brand being 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, while only eight 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. This measure was obtained from the A.C. Nielsen scanner panel database at the brand and chain level for each week.

Coupon activity is operationalized as the degree of coupon intensity for a brand over time and is measured as the total coupon circulation multiplied by the effective 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 the effective face value of \$0.50). This measure

includes all coupons that are offered through newspaper vehicles that reach at least five percent of the households within a market. Within the A.C. Nielsen scanner panel database, coupon data is provided by Nielsen Media Research only at the market level. We assume, therefore, that the probability of a brand's coupon exposure is independent of the chain shopped within that market.

While these two measures of market deployment target the household, other measures of market deployment may be directed at retailers. Trade promotions, for example, are frequently used by manufacturers to encourage retail promotions such as feature advertisements and in-store displays. Unfortunately, measures of the amount of trade support offered by manufacturers to the retail chain were not available. Therefore, retailer promotions were not included as a measure of market deployment.

Accumulated Resources. Per our predictions, we measure intangible marketing resources, intangible technological resources, and financial resources. To ensure the distinction between each resource and market deployment action, measures of resources focus on those that are owned by the firm and that are 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 measure 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 felt they captured four aspects of brand equity specified by Aaker (1991): brand associations; brand loyalty; perceived quality; and brand awareness, respectively.

We measure each of these four elements in the following way. The number of a brand's line extensions reflects the flavors, sizes, or varieties of an existing brand and was measured as the number of stock keeping units (SKUs) for each brand. Share of category requirements is a measure of customer retention (Bhattacharya et al. 1996) and was collected from Information Resources, Inc. (IRI) at the brand and annual level. Price premiums, which are often associated with quality, were

measured as the annual average brand price divided by the annual average price of the product category. Finally, intangible value was measured using Tobin's Q, which reflects a firm-level estimate of brand equity (Chung and Pruitt 1994) representing the value of intangible assets, and was calculated from the firm's annual financial statements. This measure was then converted 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 utilized the standardized factor loadings from a confirmatory factor analysis to calculate the weighted sum from each factor.⁴

Intangible technological resources are operationalized as the successful output from internal R&D processes (Grant 1991; Hall, Griliches, and Hausman 1986) and are measured 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 that a patent has been referenced in subsequent patents (Trajtenberg 1990). Since patents vary greatly in value, the use of patent counts is less informative than the use of patent counts weighted by citations. Thus, patents were first classified to ensure that only those patents relevant to the product category were included. In particular, patents were first filtered to reflect only food-related patents and then coded by the first author and a graduate research assistant for relevance to the product category. For example, Procter & Gamble owns brands in numerous product categories, yet a patent entitled "coffee brewing method" would be considered relevant for the coffee product category and not for other product categories. Inter-rater 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 regarding 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 et al. 1986). Therefore, the overall value of a patent was depreciated over its legal life. We adopt a straight depreciation approach used by Moorman and Slotegraaf (1999), where the value of a patent's contribution declines at a constant rate each year. To capture a stable measure of technological resources, patents produced over a three-year period

were examined, which is consistent with Griliches and Mairesse (1984).⁵ This multi-year approach was used since 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 et al. 1986). The composite index measure of intangible technological resources was therefore calculated as follows:

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

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,⁶ and C_{pin} refers to the number of patent citations of patent p for brand i for each of the three years. Patent information was collected from data developed by the U.S. Patent and Trademark Office and available through its national database website (<http://www.uspto.gov>) and through a commercially housed website (<http://www.delphion.com>).

Financial resources are operationalized as the level of liquid assets accumulated by a firm and measured using Jensen's measure of free cash flow. This measure reflects the excess cash not distributed to securityholders as either interest or dividend payments and therefore available for deployment (e.g., Jensen 1986; Lehn and Poulsen 1989). The level of excess cash available for deployment is calculated as the prior year's operating income, after subtracting total income taxes, gross interest expense, and dividends paid in prior year (Lehn and Poulsen 1989). This measure, collected from financial statements as reported in the Compustat database, is only reported at the firm level. To convert the level of financial resources to the brand level, firm-level resources are allocated to the brand in proportion to brand sales. Each brand's annual dollar sales is divided by the firm's annual dollar sales to calculate the proportion. To obtain the level of excess cash at the brand level, the proportion is multiplied 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 focus 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 A.C. Nielsen approach used to calculate baseline sales uses exponential smoothing across non-promoted weeks to eliminate the effect of retailer promotions but does not eliminate effects from factors such as distribution, manufacturer coupon offers, or baseline price. Thus, using a brand's baseline sales volume as the measure of performance controls for extraneous sales shocks due to trade promotion. This measure was attained from the A.C. Nielsen scanner panel database. A summary of the measures used in the analysis and the intercorrelations between them is provided in Table 2.

Insert Table 2 here

ANALYSIS AND RESULTS

Since this research involves nested data (i.e., weekly market deployment observations for a brand are nested within the firm's accumulated resources), we use a hierarchical model approach so that each of these levels is represented in a sub-model. Specifically, we utilize a three-stage sequential, hierarchical regression model. In the first stage, we examine the potential direct effects that accumulated resources have on market deployment. In the second stage, we analyze the sales responsiveness to market deployment over time, using only that portion of market deployment that is unexplained by accumulated resources. Finally, in the third stage, we examine the effects of accumulated resources on the parameters estimated in the second stage.

Returns to Market Deployment

Model Estimation. In order to estimate the returns to market deployment, we are interested in isolating those returns attributed specifically to market deployment. In particular, it is likely that the level of market deployment is due, in part, to levels of accumulated resources. Therefore, to

capture returns to market deployment not explained by resources, we aggregate deployment to an annual level in this first stage to account for these possible effects (since our resource measures are all at the annual level). Following Christen et al. (1997), a multiplicative model form was estimated in order to capture inter-relationships. In this first stage of the sequential hierarchical regression, we regress market deployment on accumulated resources as specified in Equation 2 below:

$$(2) \quad MD_{ij} = q_{0j} (IMR_i)^{q_{1j}} (ITR_i)^{q_{2j}} (FR_i)^{q_{3j}} w_{ij}$$

Where: MD_{ij} \equiv annual market deployment action j for brand i ;
 q_{hj} \equiv parameter h for market deployment action j ;
 IMR_i \equiv intangible marketing resources for brand i ;
 ITR_i \equiv intangible technological resources for brand i ;
 FR_i \equiv financial resources for brand i ;
 w_{ij} \equiv disturbance term.

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

Results indicate that accumulated resources do influence market deployment actions directly, as both distribution-related actions ($R^2 = 0.74$ in 1997 and 0.59 in 1998) and coupon-related activities ($R^2 = 0.06$ in 1997 and 0.17 in 1998) are significantly related to resources. Specifically, distribution-related actions are positively influenced by intangible marketing resources ($q_{11} = 0.546$, $p < .01$ in 1997; $q_{11} = 0.671$, $p < .01$ in 1998) and financial resources ($q_{31} = 0.409$, $p < .01$ in 1997; $q_{31} = 0.334$, $p < .01$ in 1998) and negatively influenced by intangible technological resources ($q_{21} = -0.073$, $p < .10$ in 1997; $q_{21} = -0.031$, ns in 1998). Coupon-related activities are positively influenced by intangible marketing resources ($q_{12} = 0.035$, ns in 1997; $q_{12} = 0.454$, $p < .01$ in 1998), intangible technological resources ($q_{22} = -0.078$, ns in 1997; $q_{22} = 0.183$, $p < .05$ in 1998), and financial

resources ($q_{32} = 0.117, p < .05$ in 1997; $q_{32} = 0.008, p < .10$ in 1998). Therefore, as anticipated, this first stage was important in order to partial out the effect of resources on market deployment so that we can focus our investigation on the effects of market deployment not explained by accumulated resources.

We utilized the residuals from Equation 2 in the second stage, as it represents the level of market deployment not accounted for by accumulated resources. As in Equation 2, we use a multiplicative specification. This specification is important, since a multiplicative model assumes proportionally equal effects across chains. That is, since 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 A.C. Nielsen-calculated measure that excludes price promotions. We utilized the price residual from the first stage of the model since 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 the average competitor distribution coverage, the average competitor coupon activity, and the 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 Bureau of Labor Statistics and included PPI in the model for each product category. Finally, since data are pooled across chains, we also included chain-level indicator variables to capture any systematic differences across chains. Equation 3 was then estimated separately for each brand in each year (i.e., 1997, 1998) to examine sales responsiveness of market deployment over time.

$$(3) \quad S_{ikt} = b_{0i} (D_{ikt})^{b_{1i}} (C_{ikt})^{b_{2i}} (P_{ikt})^{b_{3i}} (CD_{ikt})^{b_{4i}} (CC_{ikt})^{b_{5i}} (CP_{ikt})^{b_{6i}} (PPI_{it})^{b_{7i}} \prod_k (M_k)^{b_{8i}} v_{ikt}$$

Where: S_{ikt} \equiv baseline volume sales for brand i in chain k in week t ;
 b_{hi} \equiv parameter h for brand i ;

- D_{ikt} \equiv residual of distribution coverage from equation 2 for brand i in chain k in week t ;
 C_{ikt} \equiv residual of coupon activity from equation 2 for brand i in chain k in week t ;
 P_{ikt} \equiv covariate: residual price from equation 2 for brand i in chain k in week t ;
 CD_{ikt} \equiv covariate: average competitive distribution coverage for brand i in chain k in week t ;
 CC_{ikt} \equiv covariate: average competitive coupon activity for brand i in chain k in week t ;
 CP_{ikt} \equiv covariate: average competitive price for brand i in chain k in week t ;
 PPI_{it} \equiv covariate: producer price index for brand i in week t ;
 \mathbf{M}_k \equiv covariate: vector of chain indicator variables of chain k ;
 v_{ikt} \equiv disturbance term.

Results from Equation 3 indicate that market deployment significantly influences sales, which confirms existing evidence (mean $R^2 = 0.926$; range of 0.124 to 0.999). Across brands, model results indicate that distribution actions have a positive effect on sales (mean $b_1 = 0.771$; range of -17.275 to 5.567 ; and 93.3% with positive effect)⁷ and coupon activity has a positive effect on sales (mean $b_2 = 0.003$; range of -0.048 to 0.079 ; and 93.0% 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 ; and 62.9% with negative effect) whereas the effect of producer price index is positive (mean $b_7 = 0.001$; range of -2.94 to 1.56 ; and 69.0% with positive effect). Among competitive covariates, the effects of average competitor distribution coverage and coupon activity are positive (mean $b_4 = 1.45$; mean $b_5 = 0.002$) while the effect of average competitor price is negative (mean $b_6 = -0.674$). While 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 utilized 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 below. 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, since 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. While market deployment changes over time, the independent variables in Equation 4 remain stable over the year. Therefore, in this sequential approach, Equation 3 is estimated for each brand to derive own elasticities for each measure of market deployment across each of the two years of data. Equation 4 was then estimated using the unconstrained parameter estimates as the dependent variable. This results 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.

$$(4) \quad b_{ij} = \gamma_{0j} + \gamma_{1j} \log(\text{IMR}_i) + \gamma_{2j} \log(\text{ITR}_i) + \gamma_{3j} \log(\text{FR}_i) + \gamma_{4j}(\text{F}_i) + \gamma_{5j}(\text{SA}_i) + \Gamma_{cj}(\text{CT}_c) + u_{ij}$$

Where: b_{ij} \equiv market deployment j sales response parameter for brand i ;

γ_{hj} \equiv parameter h for market deployment j ;

IMR_i \equiv intangible marketing resources for brand i ;

ITR_i \equiv intangible technological resources for brand i ;

FR_i \equiv financial resources for brand i ;

F_i \equiv covariate: number of employees of firm that owns brand i ;

SA_i \equiv covariate: average annual sales for brand i ;

Γ_{cj} \equiv vector of parameters for category indicator variables for category c ;

CT_c \equiv covariate: vector of category indicator variables for category c ;

j \equiv 0 for the intercept, 1 for distribution, and 2 for coupon;

u_{ij} \equiv disturbance term.

Since the dependent variable is an estimate of market deployment elasticities, to produce efficient estimates of model coefficients, the data are weighted 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, OLS was used 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 utilized the intercept from Equation 3 as the dependent variable in Equation 4.

While 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, while 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. Results from Equation 4 indicate that the nonlinear, monotonic functional form provides a reasonably good fit for returns to distribution-related market deployment ($F_{13,280} = 56.86$, $p < .01$, Adj. $R^2 = 0.71$) and coupon-related market deployment ($F_{13,87} = 2.295$, $p < .05$, Adj. $R^2 = 0.14$). We also benchmarked this specification against two alternative functional forms—a linear specification and a nonlinear, non-monotonic (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. Further, 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 relationship implied by the quadratic form.

Intangible Marketing Resources (H_1). Results indicate that intangible marketing resources exhibit positive, diminishing marginal effects on returns to distribution-related market deployment ($\gamma_{11} = 0.281$, $p < .01$) as well as on returns to coupon-related market deployment ($\gamma_{12} = 0.003$, $p < .05$), which is consistent with H_1 (see Table 4). Therefore, a brand's equity influences the effectiveness of deployment actions. In particular, while brands with less accumulated intangible marketing resources attain lower returns, brands with moderate-to-high levels attain higher returns to distribution- and coupon-related market deployment.

Intangible Technological Resources (H₂). As shown in Table 4, results indicate that the level of accumulated intangible technological resources has a positive, diminishing marginal effect on returns to distribution ($\gamma_{21}=0.047, p<.01$). These results support H₂. While the effect of intangible technological resources supports the predicted direction of effects for returns to coupon-related market deployment, these effects are not significant (γ_{22} *ns*) and do not support H₂.⁹ Thus, firms with a strong level of accumulated technological resources should expect greater returns if they direct their efforts toward distribution actions than towards the use of coupons for their brands.

Financial Resources (H₃). Results indicate that the level of financial resources has a negative, diminishing marginal effect on returns to distribution-related ($\gamma_{31} = -0.112, p<.01$) and on returns to coupon-related market deployment ($\gamma_{32} = -0.001, p<.10$). Therefore, the level of accumulated financial resources impacts the effectiveness of market deployment actions. Specifically, returns to distribution and coupon deployment appear to be highest for brands with less financial resources, which supports H₃. This suggests that firms with more accumulated financial resources may be less effective in their distribution and coupon activity, potentially due to 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, with this effect most dramatic at lower levels of resources. Consider, for example, three brands in our sample with differing 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), while 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—although diminished—return with 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 differing levels of financial resources, consider

Brand D with \$4 million and Brand E with \$399 million. While 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 also Figures 1 and 2). The difference between returns for distribution and those for coupon are 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 vs. 10.1 patent stock) and attains 2.6 times the returns for distribution and only 1.4 times the returns for coupon (see also Figures 1 and 2).

Insert Figures 1 and 2 here

Direct Effect of Resources on Sales. As previously indicated, though we do not focus on predicting a relationship between resources and sales, prior research from the resource-based view of the firm indicates such a relationship exists. As an ancillary investigation of this relationship, we utilize 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 ($\gamma_{30} = -0.5526, p < .01$), while the effects of intangible marketing and technological resources are not significant (see Table 4). Therefore, as predicted by the resource-based view, resources do exert a direct effect on sales, yet these results further suggest that the main impact of resources is via its effect on deployment (revealed in the first stage of our analysis) and its effect on returns to deployment (revealed in the third stage of our analysis).

Insert Tables 3 and 4 here

DISCUSSION

The interdisciplinary literature on competitive advantage until this point 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 that we discuss in this section. 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. Finally, for marketing strategy researchers, our results reaffirm that firm resources are important but also challenge researchers to include a greater emphasis on the role of resource deployment in competitive advantage.

How Resources Impact Market Deployment Effectiveness

As anticipated, and consistent with prior research, results show significant sales returns to market deployment. More interesting, however, are the significant effects of accumulated resources on returns to market deployment. This supports our argument that organization-level factors can impact 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 numerous 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. On the other hand, when fewer financial resources are available, 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 linkage between financial resources and many organizational processes, we suggest this resource will also become more rigid in administration and hence 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, which argues 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 allow 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 brand equity promises greater returns. On the other hand, leveraging 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, the managers need to balance the short-term gains in returns from market deployment with the longer-term threats to brand equity.

Regarding 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. On the other hand, 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 its products, which therefore affects coupon evaluation and redemption (Raghubir 1998).

We also recognize that there may be synergies between resources. To explore whether any synergies between resources may influence market deployment returns, we also 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 ($\gamma = -0.002, p < .05$) but not a significant influence on returns to distribution deployment ($\gamma = 0.011, ns$). Therefore, while 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 level of financial resources decreases the effectiveness of coupon activity, pointing to the rigidity-inducing effects associated with financial resources. Considering the lack of other interactions, the independent effects of the resources appear to be the critical effects on returns to market deployment.

Contributions toward the Resource-Based View of the Firm

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

Furthermore, while 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 controlling 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, SBU, organization, etc.).

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.

Importantly, our results indicate different effects for various types of firm resources, suggesting that research should consider modeling the effect of resources separately. The current approach to control for firm-level differences through fixed-effects removes both observed and unobserved firm differences. This approach, however, does not provide the opportunity to examine the complex relationship between 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 very different returns.

For example, consider distribution intensity research. Frazier and Lassar (1996) show that returns to distribution intensity are influenced by factors such as retailer commitments, manufacturer brand strategy, and channel practices. 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

Delineating firm resources from market deployment affords the opportunity to examine how resources and deployment influence firm performance jointly as well as 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. While prior research has examined, for example, the effects of market orientation on competitive advantage (e.g., Jaworski and Kohli 1993), it has emphasized possessing a market orientation as a valuable firm-level resource. We find that various firm-level resources *and* marketing-specific actions inter-relate in complex ways to influence competitive advantage.

These findings support a growing appreciation of firm-level differences in the field of marketing. While research has provided insight into the nature and effects of firm differences on

market and business performance, research has not examined how firm differences impact 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 will encourage 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 with marketing capabilities (e.g., Moorman and Slotegraaf 1999). Our research further supports these perspectives by illustrating that brand equity and technological patents impact the effectiveness of marketing actions.

Finally, this research suggests that it is not necessarily what firms own, but what firms do with what they own that is critical. 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 due to a lower level of accumulated resources. Instead, our results suggest that deployment can produce greater returns, enabling them to survive and grow over time. Therefore, this research offers initial insight for firm decisions regarding 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 Future Research

Our intention is not to offer an all-inclusive view of the relationship between 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. Based on the results, this goal was achieved. In the following discussion, we suggest various avenues for future 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. While firms that offer multiple brands also provide varying 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, while 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 as well as in levels of resources, future research should examine the effects at various levels of analysis, such as the strategic business unit (SBU) level or overall organization level.

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 front-line employees but also on a firm's resources such as its physical surroundings. Thus, service industries may offer a rich context to examine the complex relationship between firm resources, market deployment, and performance outcomes.

Third, an important avenue for future research is the examination of additional measures of resources, market deployment, and performance. While our approach focused on secondary measures, there are limitations to our dataset. For example, we examined resources at the brand level where, 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. Other measures of market deployment, however, are likely to provide rich insight. For example, our sample precluded the use of advertising as a measure of market deployment since 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 good industry, the retailer is the primary decision-maker when it comes to pricing decisions rather than the

manufacturer, thus involving deployment and resource possession at the trade level. Moreover, our dataset did not include trade promotional activity measures, and thus we were unable to account for any potential relationship between trade promotional activity and distribution.

While 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 since 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 (since 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, future 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). Though the nonlinear monotonic specification provided a slightly better fit than the quadratic specification, the two yielded a fairly similar fit. Future 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 insight.

Overall, the value to be gained from incorporating both a resource and 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 will enable further assessment of the potential effects of firm resources on returns to marketing mix effects estimated from conventional data sources.

NOTES

1. In fact, compared to 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 extended too often (Keller and Aaker 1992).
2. This is because financial statements are reported at the overall firm level and not at the strategic business unit level, though examining market deployment actions at the overall firm level is also difficult. For example, while some firms report advertising expenditures within their financial statements, it is not a requirement and many firms do not report it. An exception of annual data at the strategic business unit level is the PIMS database.
3. Though pricing decisions are not effortless, it is unclear how to operationalize a price-based measure of market deployment. For example, some may argue that a higher price reflects greater effort, while others argue that a lower price reflects greater effort. Still others may argue that the frequency of changes in baseline price reflects effort, while others argue that it actually requires little effort. Given these differing views, we decided not to utilize a price-based measure of market deployment but to include it as a covariate in the marketing mix model (Equation 3). Furthermore, an advertising measure of market deployment was not used because fewer than 25% of the brands examined exhibited any form of television (43 of 168 brands) or print (34 of 168 brands) advertising.
4. The factor loadings associated with the four brand equity elements are: number of line extensions (0.840); share of category requirements (0.106); price premiums (0.001); and intangible value (0.110).
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-year or a four-year measure, indicating that results are invariant to time horizon.
6. Intangible technological resources in 1998 reflects patents from 1996 through 1998, whereas intangible technological resources in 1997 reflects patents from 1995 through 1997. Over the 17-year life of a patent, the weights used to calculate the level of technological resources were 1/17; that is, .8824 in $n-2$, .9412 in $n-1$, and 1.0 in n .
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 producer price index ($b_7 = -2.940$, -2.745 , -2.321 , and -1.959). These extreme cases were retained in the analysis to capture effects from the full range of our data.
8. As pointed out by one anonymous reviewer, 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.
9. It is possible that this insignificant effect is partially a result of low power, given only approximately half of the brands in our sample offered coupons over the time 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 (0.082 to 13.942); intangible technological resources (0 to 88.825); and financial resources (0 to 0.604).
11. This weighted score is based on our overall measure of brand equity, which was calculated from the standardized factor loadings from confirmatory factor analysis as previously described.
12. Only brands from publicly available data were examined. This included brands from publicly-traded firms and brands from privately-held firms that publish their financial statements.

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	8,139	8,319	9,417	8,843	2,550	7,360	8,954	10,920	5,333

TABLE 2**Summary of Means, Standard Deviations, and Correlations of Key Constructs**

Construct	Measure	Mean	s.d.	(1)	(2)	(3)	(4)	(5)	(6)
<u>Performance:</u>									
1. Sales Volume	Baseline sales	3978	9419	1.000					
<u>Market Deployment:</u>									
2. Distribution actions	Distribution points	681.2	976.7	0.697	1.000				
3. Coupon activity	Coupon intensity	20.4	130.7	0.047	0.065	1.000			
<u>Resource:</u>									
4. Intangible marketing	Brand equity index	4.3	2.9	0.441	0.647	0.005	1.000		
5. Intangible technological	Patent citation index	10.9	19.1	0.105	0.132	-0.002 ^a	0.162	1.000	
6. Financial	Jensen's free cash	24.3	62.1	0.477	0.477	0.001 ^b	0.482	0.514	1.000

Note: ^a $p > .10$; ^b $p < .10$; All other correlations are significant at $p < .05$.

TABLE 3
Comparison of Model Specification

	Returns to Distribution			Returns to Coupons		
	Linear	Quadratic	Log	Linear	Quadratic	Log
<i>Overall Model</i>						
F statistic	24.52 **	35.28 **	56.86 **	1.59	1.75 †	2.29 *
R-square	0.57	0.70	0.73	0.19	0.25	0.26
Adj. R-square	0.54	0.68	0.71	0.07	0.11	0.14
<i>df</i> (model, error)	13, 280	16, 277	13, 280	13, 87	16, 84	13, 87

** p < .01
 * p < .05
 † p < .10

TABLE 4

Explanatory Role of Accumulated Resources on Market Deployment Returns
Parameter Estimates

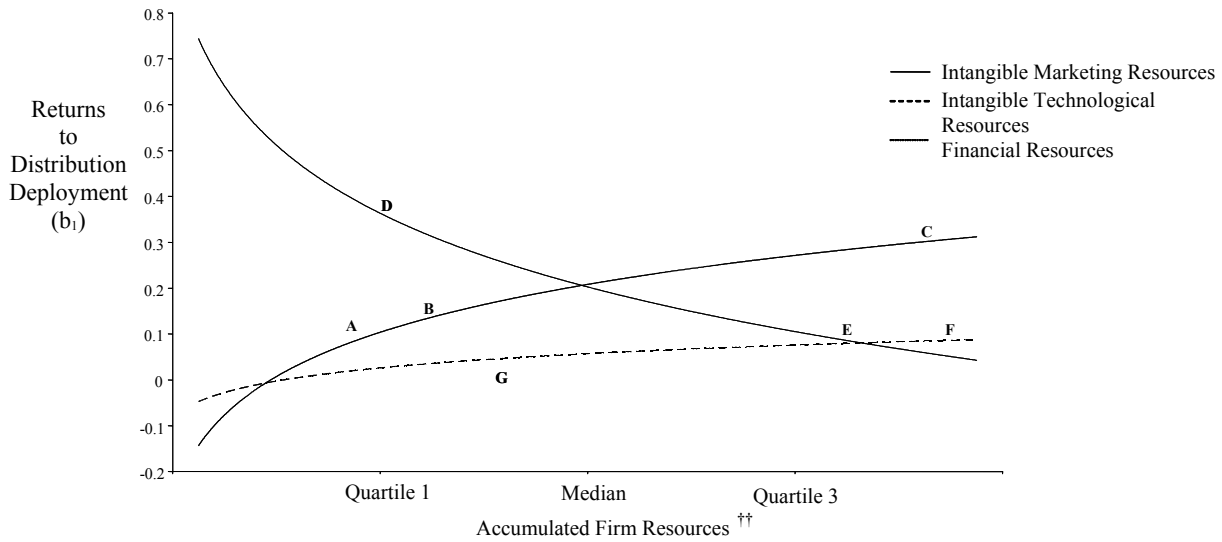
	Hypothesized Sign	Returns to Distribution	Returns to Coupons	Direct Effect on Sales
<i>Predictor Variables</i>				
ln(Intangible marketing resources)	+	0.2812 **	0.0030 *	0.1512
ln(Intangible technological resources)	+	0.0469 **	0.0001	0.0022
ln(Financial resources)	-	-0.1120 **	-0.0013 †	-0.5526 **
<i>Control Variables</i>				
Number of employees in firm		0.0043	-0.0021	0.0015
Average annual brand sales		-0.0000	-0.0001	0.0001 **
Category indicator 1		-2.0761	0.4654	1.6791 †
Category indicator 2		-1.5809	0.7649	3.1631 **
Category indicator 3		-3.7647 †	0.3047	2.4523 **
Category indicator 4		-2.8734	0.4406	0.7153
Category indicator 5		-3.6020 †	0.6167	2.5931 *
Category indicator 6		-1.5734	0.7507	1.2072
Category indicator 7		0.2879	2.1411 †	0.3863
Category indicator 8		-3.7395 †	0.2534	-0.4380
<i>Overall Model</i>				
Adjusted R-square		0.7125	0.1432	0.2228
F statistic		56.86 **	2.29 *	7.46 **
df (model, error)		13, 280	13, 87	13, 280

** p < .01

* p < .05

† p < .10

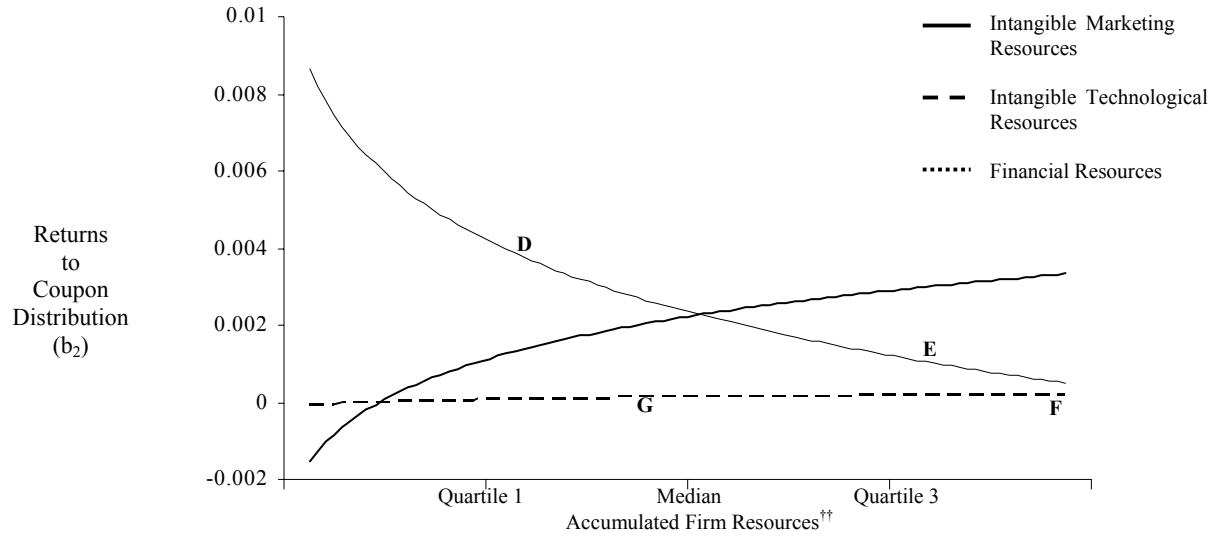
FIGURE 1
The Effect of Firm Resources on Returns to Distribution Deployment



Note: Letters in Figure 1 represent different brands. For example, Brand A has fairly weak brand equity (2.6 weighted brand equity score (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 while Brand E has \$399 million. And to illustrate effects of intangible technological resources, Brand F has a high level of patent stock (61.9) while Brand G has a moderate level of patent stock (10.1).

†† The results should not be generalized beyond the range examined here, which is: intangible marketing resources (0.082 to 13.942); intangible technological resources (0 to 88.825); and financial resources (0 to 0.604).

FIGURE 2
The Effect of Firm Resources on Returns to Coupon Deployment



Note: Letters in Figure 1 represent different brands. For example, Brand D has \$4 million while Brand E has \$399 million. To illustrate effects of intangible technological resources, Brand F has a high level of patent stock (61.9) while Brand G has a moderate level of patent stock (10.1).

†† The results should not be generalized beyond the range examined here, which is: intangible marketing resources (0.082 to 13.942); intangible technological resources (0 to 88.825); and financial resources (0 to 0.604).

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