MARKET RESPONSE TO A MAJOR POLICY CHANGE IN THE MARKETING MIX: 
LEARNING FROM P&G’S VALUE PRICING STRATEGY

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EXECUTIVE SUMMARY

Most research on how consumers and competitors respond to advertising and promotion focuses on response to short-term changes in these marketing instruments. In contrast, this paper uses Procter & Gamble’s value pricing strategy as an opportunity to study consumer and competitor response to a major, sustained change in marketing mix strategy. We compile data for 118 brands across 24 product categories where P&G is a player, covering a seven-year period from 1990-1996 when P&G initiated and broadly implemented its value pricing strategy in the U.S. During this period, the company instituted major cuts in deals and coupons and substantial increases in advertising across its product line. We use regression-based models to examine how consumers and competitors reacted to these changes, and trace the net impact on market share. Our consumer response model decomposes market share into penetration, share of requirements, and category usage among the brand’s customers. For the average brand, we find that deals and coupons increase penetration and, somewhat surprisingly, have little effect on customer retention as measured by SOR and USE. For the average brand, advertising also works primarily by increasing penetration but its effect is weaker than that of promotion. We find little evidence that advertising increases SOR or USE among a brand’s existing users. Overall, advertising is more beneficial for small brands while promotion is more beneficial for large brands. Our competitor
response model shows that response is related to how strongly the competitor’s market share is affected by the change in P&G’s marketing mix (through cross-elasticities) and how strongly its own reaction will affect its share (through self-elasticities). Competitors also respond differently due to structural factors such as market share position and multi-market contact, and due to firm-specific effects. Competitors do not react the same way on all marketing instruments. They tended to decrease advertising and coupons but used deals to gain market share even when they were benefiting from P&G’s policy change. We find that the net impact of consumer and competitor response is a decrease in market share for the initiating company, although it is plausible that its profits increased. The loss in penetration resulting from promotion cuts is not offset by increases in SOR or by competitive reactions. It appears that cuts in promotion, even if coupled with increases in advertising, will not grow market share for the average established brand in mature consumer goods categories. We discuss the implications of these and other findings for both researchers and practitioners.
1. Introduction

In the last decade, researchers have made important advances in understanding both consumer and competitive response to advertising and promotion. Researchers have quantified consumer response to promotion in terms of brand switching, repeat purchase, stockpiling, and consumption (Gupta 1988; Ailawadi and Neslin 1998; Bell, Chiang, and Padmanabhan 1999), and investigated the extent to which advertising attracts new users and retains loyal customers (Tellis 1988; Deighton, Henderson, and Neslin 1994). In studying competitor response, researchers have assessed the role of marketing mix elasticities (Leeflang and Wittink 1996; Putsis and Dhar 1998) and begun to unravel the game-theoretic structure of competition (Cotterill, Putsis, and Dhar 1999; Kadiyali, Vilcassim, and Chintagunta 1999).

While these studies have enhanced our understanding of how consumers and competitors respond to advertising and promotion, they typically focus on response to short-term changes in these marketing instruments. Rarely have researchers studied the effects of major policy changes. The purpose of this paper is to examine market response to a major and sustained change in advertising and promotion policy. We use P&G’s value pricing strategy to examine consumer and competitive response, and to trace how this response ultimately affects market share. Starting in 1991-92, P&G instituted major reductions in promotion and increases in advertising in an effort to reduce operating costs and strengthen brand loyalty (Shapiro 1992). This new policy ran counter to the general trend of promotion increases at the expense of advertising that prevailed in the packaged goods industry during the eighties and early nineties (Donnelley Marketing 1997).
Analysis of market response to such a major policy change offers several advantages. First, it provides substantial variation in marketing mix variables instead of week-to-week movement around a fairly stable level. This provides better estimates of the impact of marketing mix variables. For example, Deighton, Henderson, and Neslin (1994) find that advertising attracts consumers to the brand but does not increase purchase probabilities among current users. They note, however, that this finding may not be applicable beyond the range of their data.

Second, the sustained policy change allows us to evaluate the effectiveness of advertising and promotion in a long-term setting. Studies based on short-term changes in advertising and promotion often find that promotion has a much stronger effect on market share than advertising (e.g., Tellis 1988; Sethuraman and Tellis 1991; Deighton, Henderson, and Neslin 1994). However, Farris and Quelch (1987, p. 91) note that the effects of relatively minor changes in advertising are hard to detect and recommend that advertising experiments should be long enough for measurable effects to occur.

Third, it also allows us to study competitor response in a long-term setting. The reaction of competitors to marketing mix changes by a market leader depends, at least to some extent, on consumer response elasticities (Gatignon, Anderson, and Helsen 1989; Leeflang and Wittink 1996). Thus, if consumer response to sustained marketing mix changes differs from short-term response, competitor response is likely to be different.
Fourth, researchers have recently called for studying responses to fundamental policy changes that are of strategic importance to senior management, not just the tactical changes that are made in the short-term (e.g., Abeele 1994).

Fifth, the fact that P&G is the clear leader in this setting simplifies the analysis of competitive response in that we don’t have to first determine who, if anyone, is the leader (see, for example, Leeflang and Wittink 1996; Kadiyali, Vilcassim, and Chintagunta 1999).

Finally, P&G’s policy change is broad-based. Our data and analysis encompass 118 brands in 24 product categories in the packaged goods industry. This should make our results more generalizeable than those of other market response studies that are based on one or two product-markets.

We use the sustained policy change enacted in P&G’s value pricing move to investigate three major research questions:

- What are the roles of advertising and promotion in attracting and retaining customers?
- To what extent are competitor reactions determined by market share response elasticities and structural factors versus firm-specific strategy?
- How do consumer and competitive responses combine to determine the overall effect of a sustained change in advertising and promotion on market share?

Our study is unique in integrating both consumer and competitor response to a substantial, sustained change in advertising and promotion, and in doing so across a large number of brands and product categories.
The paper is organized as follows. First, we discuss previous work relevant to the central questions of this research, and present our conceptual model for analyzing them. In Section 3, we describe the data and provide an overview of P&G's Value Pricing strategy. Sections 4 and 5 present results for consumer and competitor response. Section 6 shows how these responses combine to determine the overall impact on market share. In Section 7, we summarize our findings and discuss implications for researchers and managers.

2. Theoretical Background and Conceptual Model

In this section, we summarize the theoretical and empirical literature on consumer and competitor response to advertising and promotion that is most relevant for our research questions, and use it to develop our conceptual model.

2.1 Consumer Response

A firm’s advertising and promotion policy influences its ability to attract and retain customers by inducing more of them to (a) switch to the firm’s brand, (b) repeat-purchase it more often, or (c) consume larger quantities.

(a) Brand Switching: As described by Blattberg and Neslin (1990), promotions induce consumers to switch into a brand by improving short-term attitudes toward it, conditioning consumers to respond to promotions, simplifying the purchase decision, and reducing perceived risk. These theories are supported by several empirical studies showing that promotions result in a large brand switching effect (e.g., Gupta 1988; Bell, Chiang, and Padmanabhan 1999).
Advertising can induce brand switching either through raising awareness or improving consumer attitudes (Vakratsas and Ambler 1999). While there is ample evidence that advertising influences awareness and attitudes, there is less evidence that it exerts a significant effect on brand switching. Deighton et al. (1994), and Lodish et al. (1995a, b) find that advertising helps small or new brands, presumably by attracting new users.

(b) Repeat Purchasing: Three theories point to a negative relationship between promotion and repeat purchasing. First, self-perception and attribution theories suggest that steep price cuts encourage consumers to attribute their purchase of the brand to the promotion, not to underlying preferences (Dodson, Tybout, and Sternthal 1978). Second, behavioral learning theory indicates that promotions train the consumer to buy on deal rather than repeat-purchase the brand (Rothschild 1987). Third, promotion can reduce the consumer’s reference price for the brand, causing “sticker shock” on the next purchase (Winer 1986).

Theoretical support also exists for a positive effect of promotions. Promotions can be used to “shape” brand loyalty, thus increasing repeat rates (Rothschild and Gaidis 1981). Promotions can increase repeat rates in a competitive environment because they preempt current users from taking advantage of other brands’ promotions and therefore increase purchase probabilities not only among new triers but among current users as well.

Empirical research on promotion and repeat purchasing has produced a range of findings, including a negative association (Dodson, Tybout, and Sternthal 1978), no association (Ehrenberg, Hammond, and Goodhardt 1994), and both positive and negative associations (Gedenk and Neslin 2000).
Theory regarding the role of advertising in repeat purchasing centers on attitudes and framing. Advertising enhances beliefs, thereby improving attitudes and encouraging higher repeat rates. Framing theory suggests that advertising does not immediately persuade the consumer but it does predispose him or her toward a favorable consumption experience.

Empirical evidence on the role of advertising in repeat purchasing is mixed. Deighton (1984) provides evidence for framing, and Tellis (1994) finds that advertising increases repeat purchasing. On the other hand, Deighton et al. (1994) find that advertising serves more to induce brand switching than to reinforce repeat purchasing. Lodish et al.’s (1995a, b) findings also suggest that advertising primarily influences brand switching rather than repeat purchasing (small and new brands have more customers to attract and fewer to retain).

(c) Consumption: Promotion can increase the consumption rate among a brand’s users by inducing them to load up on the brand and then consume it faster (Folkes, Martin, and Gupta 1993; Wansink and Deshpande 1994; Ailawadi and Neslin 1998). However, promotion may also decrease consumption among a brand’s users because many of these users have bought only because of the promotion, and may buy smaller sizes because of perceived risk (Blattberg and Neslin 1990, pg. 49). Wansink (1994) and Wansink and Ray (1996) provide theoretical and experimental evidence that advertising can induce higher category consumption by suggesting new usage situations.

(d) Moderators of Consumer Response: Researchers have found that advertising and promotion elasticities differ by brand as well as by product category. Probably the most important brand characteristic found to influence market share elasticities is brand market share: high share
brands have weaker elasticities than low share brands (Ghosh, Neslin, and Shoemaker 1983; Bolton 1989; Danaher and Brodie 1999). Additional characteristics that have been found to influence elasticities include promotional and advertising activity, stockpileability, average purchase cycle, salesforce, distribution, and advertising copy (Ghosh, Neslin, and Shoemaker 1983; Litvack, Calantone, and Warshaw 1985; Bolton 1989; Gatignon 1993; Kaul and Wittink 1995; Narasimhan, Neslin, and Sen 1996; Bell, Chiang, and Padmanabhan 1999).

2.2 Competitor Response

There are two streams of competitor response research. The micro approach studies the nature of competitive interactions in established markets using weekly or monthly data (e.g., Leeflang and Wittink 1996; Putsis and Dhar 1998; Kadiyali et al. 1999). The macro approach focuses on the response of incumbent firms to new entrants in the market (e.g., Robinson 1988; Gatignon et al. 1989; Ramaswamy, Gatignon, and Reibstein 1994; Shankar 1998). Both streams draw on the economics, industrial organization, and/or strategy literature to identify three sets of factors that influence competitor response: (a) market share elasticities, (b) structural factors, and (c) firm-specific effects.

(a) Market Share Response Elasticities: Economic theory posits that competitor response to a firm’s change in advertising and promotion is governed by cross-elasticities (how strongly the competitor’s share is affected by the firm’s move) and self-elasticities (how easily the competitor can recover lost share). For instance, Leeflang and Wittink (1996) show that competitors should react more strongly to preserve their market shares if their cross-elasticities are high. Although self- and cross-elasticities should determine whether a competitor reacts, the empirical literature shows that it is more difficult to predict their effect on how the competitor will react. For
instance, Gatignon, Anderson, and Helsen (1989), Putsis and Dhar (1998), and Shankar (1998) show that firms compete more strongly with effective weapons, i.e., with variables for which they have strong self-elasticities. However, Brodie, Bonfrer, and Cutler (1996) and Leeflang and Wittink (1996) find that competitors often either over-react or under-react; Bell and Carpenter (1992) show that competitor response is different depending upon the objectives sought; and Putsis and Dhar (1998) note that responses to cooperative versus competitive moves can be very different.

(b) Structural Factors: Industrial organization theory suggests that market structure influences competitive interaction (Scherer and Ross 1990). Concentration of the market, market share position, and multi-market contact of competitors with the initiating firm have been identified as key structural determinants of competitor response. As with elasticities, however, it is difficult to predict the direction of their influence. For instance, some researchers believe that multi-market contact increases competitive rivalry (Porter 1980), while others argue that it leads to mutual forbearance and dampens rivalry because the competing firms have a high stake in many shared markets (Bernheim and Whinston 1990; Shankar 1999). Dominant competitors are expected to react differently from fringe firms, although it is not clear what the differences are (e.g., Spiller and Favaro 1984; Putsis and Dhar 1998; Shankar 1999). Market concentration is expected to increase cooperative behavior because monitoring is easier, signaling is more likely to be perceived, and firms are less likely to compete away high margins (e.g., Qualls 1974; Scherer and Ross 1990; Ramaswamy, Gatignon and Reibstein 1994).

(c) Firm-Specific Effects: The resource-based view conceptualizes the firm as a unique entity with specific core competencies, leadership, culture, and resources that determine its actions (Wernerfelt 1984; Barney 1991; Collis 1991; Chen 1996). Not surprisingly, the marketing
literature focuses on identifying and measuring the marketing resources of firms, e.g., brand equity, sales force, advertising and general marketing expertise, and market orientation (e.g., Capron and Hulland 1999). While market share position and marketing mix elasticities may be imperfect surrogates for resources like brand equity and marketing expertise, other resources and competencies are unobserved or difficult to measure and are accounted for through a firm-specific effect (e.g., Boulding and Staelin 1993).

2.3 Conceptual Framework

Based on this literature, we have developed the framework in Figure 1 to answer our research questions. The consumer response portion of this framework decomposes market share into three components and considers the effects of own and competitive marketing mix on these components. These effects are moderated by brand and category characteristics. The competitive response portion posits that market share elasticities, structural factors, and firm-specific effects determine competitor reaction. Finally, the net impact of a policy change by a brand comes both directly, from consumer response to its own policy change, and indirectly, through competitors’ reactions to the policy change and consumers’ response to the competitors’ reactions.

<Insert Figure 1 About Here>

(a) Decomposition of Market Share: Market share, the central focus of our study, is the product of three components: penetration (PEN), share-of-category-requirements (SOR), and category usage (USE). These three components correspond to brand switching, repeat purchasing, and consumption effects, respectively, as the means by which advertising and promotion attract and retain customers. PEN is the proportion of category users who purchase the brand at least once. SOR is the proportion of the brand’s customers’ category purchases accounted for by the brand.
USE is the average category purchase volume of the brand’s customers compared to the average category purchases of all households buying the category. Market share equals PEN times SOR times USE.¹ For example, P&G is purchased by 55% of all bar soap buyers. Buyers of P&G are somewhat heavier users of bar soap. Their use of the category is 1.30 times that of the average category user. Only 49% of their bar soap purchases are accounted for by P&G, so they are not very loyal to P&G. Therefore, P&G’s share in the bar soap category is 0.55 (PEN) times 1.30 (USE) times .49 (SOR), which is 0.3504, or 35.04% market share.

PEN is a measure of customer attraction because it reflects what proportion of category users are attracted to the brand at least once. SOR is a measure of customer retention because it reflects how much of the brand consumers buy once they have purchased it an initial time. SOR is used as a measure of brand health, even loyalty, by practitioners (Hume 1992; Bhattacharya et al. 1996; Kristofferson and Lal 1996a, b). It reflects how well the brand retains its customers, and is particularly relevant in the context of P&G’s value pricing strategy because one of the stated goals of the strategy is to improve customer loyalty.

¹ To see this algebraically, let

\[
\begin{align*}
S_B &= \text{Unit brand sales.} \\
S_C &= \text{Unit category sales.} \\
MS &= \text{Market share of the brand.} \\
N_C &= \text{Number of households that buy the category.} \\
N_B &= \text{Number of households that buy the brand.} \\
C_C &= \text{Average category unit sales per household that buys the category.} \\
C_B &= \text{Average category unit sales per household that buys the brand.} \\
\text{Then:} \\
S_C &= N_C \cdot C_C \\
MS &= S_B / S_C \\
PEN &= N_B / N_C \\
SOR &= S_B / (N_B \cdot C_B) \\
USE &= C_B / C_C \\
PEN \cdot SOR \cdot USE &= \frac{N_B}{N_C} \cdot \frac{S_B}{N_B \cdot C_B} \cdot \frac{C_B}{C_C} = \frac{S_B}{N_C \cdot C_C} = \frac{S_B}{S_C} = MS
\end{align*}
\]
(b) Effect of Advertising and Promotion: Our theoretical discussion suggests that both advertising and promotion should increase PEN by encouraging more consumers to switch into the brand, although previous empirical research suggests that the advertising effect is much weaker than the promotion effect. Advertising should have a positive effect on SOR because it should enhance repeat purchasing. Promotion could have a negative or a positive effect on SOR. Advertising should have a positive effect on USE to the extent that it suggests new product uses. Promotion could have a negative or positive effect, depending on whether it creates new usage occasions and increases the consumption rate, or brings in consumers who purchase smaller quantities to mitigate perceived risk.

(c) Moderators of Advertising and Promotion Effects: Consumer response elasticities differ systematically from category to category and brand to brand. These cross-sectional differences are not of direct interest for our research, but it is necessary to control for them in order to obtain valid estimates on average. We allow market share position, stockpileability, purchase cycle, deal intensity, and advertising intensity to moderate self- and cross-elasticities in the consumer response model. While we do not have data on all possible moderators (e.g., advertising copy), the research cited in section 2.1 suggests that the factors we include explain a significant portion of cross-sectional variation in elasticities.

(d) Competitor Response: Competitor response also differs from category to category and brand to brand. It is moderated by market share elasticities and the structural and firm-specific factors suggested in the literature. Since market share elasticities are estimated in the consumer response model, there is an important link between consumer response and competitor response. The
structural factors are market concentration, market share position, and multi-market contact. Firm-specific factors over and above these are represented by dummy variables.²

3. Method

3.1 Data

We study changes in the market between 1990 and 1996. P&G introduced their value pricing program in 1991 and implemented it over multiple years (Shapiro 1992; Kristofferson and Lal 1996a, b), and we look at the market before, during, and after implementation of the strategy. Our data are primarily from IRI's annual Market Fact Book. We select 24 product categories in which P&G participates, and compile data on price, promotion frequency and depth, as well as market share, PEN, SOR, and USE for several brands in each category. Whenever possible, we include P&G, three of its largest competitors, and at least one small competitor. The analysis is at the level of a manufacturer within a product category. That is, for a manufacturer with more than one brand within a product category, we combine the brands into one umbrella "brand".³ This results in data on 118 brands across the 24 product categories, although data for some brands are missing for one or more of the seven years. The advertising data are compiled from the Leading National Advertisers publication of annual media advertising. All the moderators in the consumer and competitor response models are derived from these data, with the exception of category stockpileability, which we obtain from Narasimhan, Neslin, and Sen (1996). Appendix 1 defines all the variables, and Appendix 2 lists the 24 product categories.

² We do not include structural or firm-specific variables other than market share position as moderators in the consumer response model because they are not relevant to consumers. For example, consumers would not be expected to react differently to a given brand’s advertising because that brand competes with another brand in multiple markets.
We note that our data reflect changes observed at the retail level, so we cannot separately measure the change in P&G’s strategy towards the trade and the consequent change in strategy of the trade. Also, these data represent activity only in US grocery stores and therefore do not speak to changes in other countries or in other channels such as mass merchandisers. However, the Market Fact Book covers a large number of packaged goods product categories and markets, and has been used to gain important insights by researchers like Fader and Lodish (1990), and Lal and Padmanabhan (1995). Our compilation is particularly valuable because we cover a period of seven years, include most of the product categories that P&G plays a role in, and augment the Market Fact Book data with media advertising data.

These data allow us to undertake a broad-based pooled time series, cross sectional analysis. This is a well-established approach in the econometric literature (Hsiao 1986), that has produced several important papers in the marketing literature (e.g., Jacobson and Aaker 1985; Hagerty, Carman, and Russell 1988; Jacobson 1990; Boulding and Staelin 1990 and 1993; and Boulding, Lee, and Staelin 1994). The advantage of this approach is that it permits broad and generalizeable analyses that span several brands, categories, or industries. The challenge is to control for cross-sectional differences so they are not confounded with longitudinal effects. We model changes over time to control for cross-sectional main effects, and incorporate moderators of both consumer and competitor response to control for cross-sectional interaction effects.

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This is consistent with the emphasis of packaged goods manufacturers on category management and with the strategic emphasis of our research. It allows us to assess a firm's category performance as a function of its advertising and promotion policy in that category.
3.2 Value Pricing: An Overview

Table 1 depicts the average percent changes in price, advertising, and promotion made by P&G and its competitors between 1990 and 1996, across the 24 product categories. Figure 2 depicts percent changes each year indexed to their values in 1990, which serves as the base year.

<Insert Table 1 and Figure 2 About Here>

Did P&G’s publicized policy change actually affect retail activity? The answer to this is a clear yes. P&G increased advertising expenditures in the neighborhood of 20% over the seven years. It also reduced promotion activities: deal frequency declined 15.7% and coupon frequency declined 54.3%. As a result of the cuts in P&G’s promotion, the net price paid by consumers increased by about 20%. Figure 2 also shows that these changes occurred gradually over several years although price and deals had stabilized by 1995-96.

How did competitors respond? For advertising and coupons, they followed P&G directionally but not completely, and for deals, they did not follow P&G at all. Competitor advertising increased, but only by 6.2%; coupon frequency decreased, but only by 17.3%; and deal frequency actually increased by 12.6%. As a result, the net price paid by consumers for competitor brands increased, but only by 8.4%. Overall, then, competitors only partly went along with P&G’s policy change. Table 1 shows the significant differences in the reactions of different companies. Colgate and Gillette were more competitive than Unilever. Both companies

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4 We refer to price decreases and advertising, deal, and coupon increases as "competitive" because these actions are intended to take share away from P&G. Analogously, we refer to price increases and advertising, deal, and coupon cuts as "cooperative." This terminology takes into account the inherent asymmetry noted by Ramaswamy, Gatignon, and Reibstein (1994), and Putsis and Dhar (1998), who point out, for instance, that following a price increase may be cooperative but following a price decrease is not.
strongly increased advertising and promotion. Lever, on the other hand, cut coupons while instituting very small increases in advertising and deals. We examine later how much of this difference in reaction across competitors is due to economic and structural factors and how much is firm-specific effects.

What was the net consequence of the strategy change and competitive reaction for P&G's market share? Our data show that, during this period, P&G lost about 18% of its share on average across these 24 categories (about 5 points per category). In line with changes in the marketing mix variables, this share loss occurred gradually over several years, and stabilized somewhat during 1995-1996.

Although this overview provides a broad picture of P&G's initiative, our purpose is to gain an in-depth understanding of the market response to the policy change. In the next two sections, we estimate econometric models of consumer and competitor response that allow us to examine not just what happened but also why it happened. Specifically, we are able to (a) quantify the individual effects of advertising and promotion on penetration, share of requirements, and category usage; (b) account for differences across brands and categories; (c) determine the role of elasticities, structural, and firm-specific factors in competitive response; and (d) attribute the total impact on P&G’s market share to changes in each of its own marketing mix variables and to competitors’ reactions.

4. The Consumer Response Model

4.1 Model Specification
We model market share as a multiplicative function of marketing mix variables, similar to Wittink et al. (1987) and Leeflang and Wittink (1996). Specifically:

\[
\text{Share}_{ict} = e^{\alpha} (\text{Price}_{ict})^{\beta_{pc}} (\text{Advt}_{ict})^{\beta_{ac}} (\text{Deal}_{ict})^{\beta_{dc}} (\text{Coup}_{ict})^{\beta_{cc}} \frac{(\text{Price}_{ict})^{\beta_{pc}} (\text{Advt}_{ict})^{\beta_{ac}}}{(\text{Deal}_{ict})^{\beta_{dc}} (\text{Coup}_{ict})^{\beta_{cc}}} e^{\delta t}
\]

where:

- \( \text{Share}_{ict} \): Market share of brand \( i \) in category \( c \) in year \( t \) relative to 1990;
- \( \text{Price}_{ict} \): Net price paid per unit volume for brand \( i \) in category \( c \) in year \( t \) relative to 1990;
- \( \text{Advt}_{ict} \): Advertising (in tens of millions of dollars) for brand \( i \) in category \( c \) in year \( t \) relative to 1990;
- \( \text{Deal}_{ict} \): Percent of total sales of brand \( i \) in category \( c \) sold on deal in year \( t \) relative to 1990;
- \( \text{Coup}_{ict} \): Percent of total sales of brand \( i \) in category \( c \) sold with manufacturer's coupons in year \( t \) relative to 1990;
- \( \tilde{\text{Price}}_{ict} \): Average (volume-weighted) "Price" of brand \( i \)'s competitors in category \( c \) in year \( t \) relative to 1990;
- \( \tilde{\text{Advt}}_{ict} \): Average (volume-weighted) "Advt" of brand \( i \)'s competitors in category \( c \) in year \( t \) relative to 1990;
- \( \tilde{\text{Deal}}_{ict} \): Average (volume-weighted) "Deal" of brand \( i \)'s competitors in category \( c \) in year \( t \) relative to 1990;
- \( \tilde{\text{Coup}}_{ict} \): Average (volume-weighted) "Coup" of brand \( i \)'s competitors in category \( c \) in year \( t \) relative to 1990;

Note that the dependent and independent variables in the model are ratios with respect to the base year, 1990. This indexing is similar in spirit to Wittink et al. (1987) and controls for brand-

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5 When data are missing for 1990, we use 1991 as the base year.
specific main effects. As discussed in Section 2, market share position and four category
c characteristics moderate consumer response elasticities, so different brands in different
categories have their own elasticities, even though data for all categories and brands are pooled
to estimate the model. This results in a “process function” for elasticities (Gatignon 1993):

\[ \beta_{ki} = \beta_{k0} + \beta_{k1} \text{Small}_{ic} + \beta_{k2} \text{Mid}_{ic} + \beta_{k3} \text{AvgDeal}_c + \beta_{k4} \text{AvgAdvtg}_c + \beta_{k5} \text{AvgCycle}_c + \beta_{k6} \text{Stock}_c \]  

(2)

where:

\[ \beta_{ki} \quad = \quad \text{Elasticity for variable } k \text{ in equation (1) for brand } i \text{ of category } c; \]
\[ \text{Small}_{ic} \quad = \quad 1 \text{ if brand } i \text{ in category } c \text{ accounts for less than 5% of the sales of the top 3 brands in the category in 1990, 0 otherwise}; \]
\[ \text{Mid}_{ic} \quad = \quad 1 \text{ if brand } i \text{ in category } c \text{ accounts for 5% to 40% of the sales of the top 3 brands in the category in 1990, 0 otherwise}; \]
\[ \text{AvgDeal}_c \quad = \quad \text{Average percent sold on deal in category } c; \]
\[ \text{AvgAdvtg}_c \quad = \quad \text{Average advertising expenditure in category } c; \]
\[ \text{AvgCycle}_c \quad = \quad \text{Average length of purchase cycle for category } c; \]
\[ \text{Stock}_c \quad = \quad \text{Stockpileability of category } c. \]

We take logarithms of both sides and estimate the following log-linear model using OLS:

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6 We use a three-part classification of market share position (small, middle, and high) to allow for nonlinear or non-monotonic relationships between market share and consumer response. We include dummy variables for small and middle; high is the omitted category. In our sample, the lowest quartile of market share relative to the top three brands is about 7%, and the highest quartile is about 38%. We use slightly more extreme cutoffs of 5% and 40% to separate the really small/fringe and really big/powerful brands from the majority in the middle.

7 We correct for serial correlation that may be caused by indexing to a base year and find that the estimated elasticities are not substantively different from those obtained using OLS. We thank Vithala Rao for bringing the serial correlation issue to our attention. We also estimate the consumer response model using lagged values of the independent variables as instruments in order to control for possible simultaneity, and again find few substantive differences in estimated elasticities. Therefore, we report the OLS results here for simplicity.
We estimate this consumer response model using market share as well as the three components of market share, PEN, SOR, and USE, as dependent variables. Given the definitional identity relating market share to PEN, SOR, and USE, each coefficient estimate in the market share model equals the sum of the corresponding coefficient estimates from the models for the three components (see Farris, Parry, and Ailawadi 1992). As a result, the market share elasticity with respect to advertising equals the penetration elasticity with respect to advertising plus the SOR elasticity plus the USE elasticity.

4.2 Results

Table 2 summarizes the fit of the consumer response model for market share and its three components. Adjusted $R^2$s are quite strong, showing that changes in the marketing mix are significantly related to changes in market share and its components. Further, the F-tests show that both brand and category characteristics have a significant influence on consumer response.8

<Insert Tables 2 and 3 About Here>

Table 3 presents estimated elasticities for the average brand which suggest that:

---

8 Although the multiplicative model does not force market share predictions to lie between 0 and 100%, there are no instances in our sample of either negative predicted market share or of market shares within a category summing to more than 100%.
• Price paid is negatively associated with market share, primarily through SOR and USE. That is, lower prices enhance SOR and USE. Since our price variable is net price paid, this effect includes the impact of promotional price cuts.

• Deals and coupons have similar share elasticities, exerted mostly through PEN. Both elasticities are fairly strong even though they represent just the “signaling” aspect of promotions (the impact of price cuts themselves is included in the price variable).\footnote{We also estimate the model using regular price, calculated as shown in Appendix 1. As might be expected, price elasticities are weaker and deal and coupon elasticities are stronger in that model. We report the results based on net price to be consistent with most other scanner data based studies (e.g., Fader and Lodish 1990; Bucklin and Lattin 1991; Chintagunta 1992 and 1993; Mela, Gupta, and Lehmann 1997), and because overall model fit is better with net price.}

• The overall effect of promotion includes the signaling effect captured by the deal and coupon variables, plus the price effect captured by the price variable. Looking at how these effects combine, we conclude that promotion clearly increases PEN, since the signs of the deal and coupon variables are positive, and the sign of the price variable is negative (meaning that price cuts increase penetration). For SOR and USE, the signs of the deal and coupon variables are negative, but the signs of the price variable are also negative (meaning the price cuts associated with deals would increase SOR and USE). Even though the price coefficients are much larger than the deal coefficients, these balance out to mean that promotion has little effect on SOR and USE. This is because a fairly large percentage increase in deal frequency decreases net price paid by only a small percentage.\footnote{For example, consider a brand with a regular price of $2 and a promotion price of $1.40. Currently 70% of purchases are at regular price, and 30% are at the deal price. This yields a current net price paid of $1.82. Consider an increase in deal frequency, so that now 40% of purchases will be at the deal price. This is a 33.3% increase in the deal variable. The average price paid will then be $1.76, a 3.3% decrease in the price variable. Assuming the average elasticities as in Table 3, the new SOR compared with the current SOR will be \((0.967)^{0.266} \times (1.333)^{0.053} = 0.9937\), a marginal 0.63% decrease in SOR.}

• Advertising has a relatively weak relationship with market share. Its biggest
association is with PEN, but it has very little association with SOR.¹¹

- Competitive price cuts lead to lower share, mostly through a negative impact on SOR.
- Competitive advertising is associated with lower market share through PEN and SOR. In other words, competitive advertising makes it more difficult to attract and retain customers.
- Competitive deals and coupons are also associated with lower market share, largely through PEN and SOR.

Of course, elasticities vary for different brands in different product categories, as would be expected from the significant impact of brand and category characteristics shown in Table 2. For instance, the market share model estimates in Table 4 show that heavily advertised categories are less price-elastic, consistent with the role of advertising in product differentiation (e.g., Ghosh, Neslin, and Shoemaker 1983; Kaul and Wittink 1995). They are also less advertising-elastic, consistent with a saturation effect (e.g., Bolton 1989). Similarly, heavily promoted categories are less deal- and coupon-elastic, also consistent with a saturation effect. And, categories with long purchase cycles are less deal-elastic, consistent with the findings of Narasimhan, Neslin, and Sen (1996), but more advertising-elastic. In terms of brand differences, small brands have the strongest advertising elasticities, consistent with earlier work by Deighton et al. (1994), Lodish et al. (1995a), and Batra et al. (1995). They are also the most vulnerable to competitive price cuts and advertising, consistent with the literature on asymmetric effects (e.g., Blattberg and Wisniewski 1989). Interestingly, large brands have the strongest promotion (both deal and

¹¹ We estimate a model with current as well as lagged effects of all advertising variables (main and interaction effects) to test for carry-over effects of advertising and cannot reject the null hypothesis that all lagged coefficients are zero. These results are consistent with Lodish et al. (1995a), who find that, if advertising does not have an effect in the first year, it does not have any effect in subsequent years either.
coupon) elasticities. Table 5 provides mean elasticities for small, mid-sized, and large brands in our sample.

<Insert Tables 4 and 5 About Here>

### 4.3 Validation With Disaggregate Data

Although these findings are consistent with the theoretical and empirical literature, they are based on aggregate data. In order to ensure that our results are not an artifact of category or temporal aggregation, we validate our market share model with more disaggregate data. Specifically, we compile quarterly market share, price, and promotion data over the 1990-1996 period for 26 brands in six product categories from a dataset on the Chicago stores of the Dominicks grocery chain. The product categories are automatic dishwasher detergent, dishwashing liquid, laundry detergent (powder and liquid combined), toilet tissue, toothpaste, and toothbrushes. We obtain quarterly advertising data from Leading National Advertisers. Although the advertising data are national, there is no reason to believe that changes in the Chicago market would be systematically different from nationwide changes.

To allay concerns about aggregation over time, brands, and categories, we estimate our multiplicative market share model separately for each brand in each category instead of pooling data across brands and categories and using moderators. Thus, we obtain 26 sets of elasticity estimates. As Table 6 shows, the pattern of elasticities from this disaggregate analysis is consistent with those obtained from the aggregate analysis. Overall, price elasticities are the strongest, followed by promotion elasticities, while advertising elasticities are quite weak. A comparison of Table 6 with Table 5 shows that differences in elasticities among small, mid-
sized, and large brands are also similar to the aggregate results. Small brands have the strongest advertising elasticities and are the most vulnerable to competitive price cuts and advertising. In summary, this disaggregate analysis corroborates the findings from our aggregate data, suggesting that the latter are not an artifact of aggregation.

<Insert Tables 6 and 7 About Here>

5. Competitive Reactions

5.1 Model Specification

The competitive response model consists of four equations, one for each of the four marketing mix variables. The dependent variable in each equation is the change in the marketing mix variable of a given P&G competitor from the base year to the current period. As discussed in Section 2, competitor response should depend upon how strongly P&G’s strategy change affects the market share of the competitor. Therefore, we model competitive marketing mix reaction, \( M_{mixchg} \), as a function of \( Shreff \), the predicted effect that P&G’s strategy change would have on the competitor’s market share if the competitor does not change its strategy:

\[
M_{mixchg_{kict}} = \alpha_k + \beta_k Shreff_{ict} + \epsilon_{kict}
\]  

(4)

We model predicted share change based on the four marketing mix variables:

---

12 We also estimate the basic MCI attraction model (Cooper and Nakanishi 1988) for each category and find that the estimated elasticities are generally consistent with those from the multiplicative model.

13 We index competitive reaction to the base year (1990) for the same reason as in the consumer response model. Further we consider magnitude changes in a linear model rather than percent changes in a log-linear model because the fit of the former is significantly better for the advertising and coupon equations.

14 \( Shreff \) combines the impact of all four of P&G’s marketing mix variables. We do not model reaction to each of P&G’s marketing mix variables separately because there is strong multicollinearity among them. One option is to follow other researchers and model reactions only in kind (e.g., model competitive price changes as function of P&G’s price alone, not its other marketing mix variables). We believe combining the impact of all of P&G’s mix variables into a single \( Shreff \) variable is a better alternative because reactions may not occur only in kind (e.g., Leeftlang and Wittink 1992, 1996).
Shreff_{ict} = Share_{ic90}[(Cross_{price_{ic}})(ΔPrice_{ict}) + (Cross_{advtg_{ic}})(ΔAdvt_{ict})
+ (Cross_{deal_{ic}})(ΔDeal_{ict}) + (Cross_{coupon_{ic}})(ΔCoup_{ict})]

where:

\( M_{mixchg_{kict}} = \) Change in marketing mix variable \( k \) for brand \( i \) in category \( c \) in year \( t \) relative to 1990;

\( Shreff_{ict} = \) Predicted number of share points by which the market share of brand \( i \) in category \( c \) would change in year \( t \) relative to 1990 as a result of P&G’s strategy change if there is no reaction;

\( Share_{ic90} = \) Market share of brand \( i \) in category \( c \) in the base year 1990;

\( Cross_{kic} = \) Cross-elasticity of brand \( i \) in category \( c \) with respect to variable \( k \) estimated in the market share response model;

\( ΔPrice_{ict} = \) Percent change in the average (volume-weighted) "Price" of brand \( i \)'s competitors in category \( c \) from 1990 to year \( t \), assuming P&G’s actual change in price from year 1990 to year \( t \) and no change for other competitors. Analogous definitions are used for the other marketing mix variables.

\( α_k \) represents the change in competition's marketing mix variable \( k \) even if \( Shreff \) is zero, reflecting general trends in the market and/or an overall cooperative or competitive stance by competitors. \( β_k \) indicates how competitors change variable \( k \) in response to \( Shreff \). A positive sign for \( k = Price \) means that competitors increase their prices as P&G’s move increases their share. A negative sign means that competitors decrease their prices as P&G’s move increases their share.
Since competitor response is moderated by market share elasticities, structural factors, and firm-specific effects, we allow for both intercept and slope shifts by these factors. In order to control for other category characteristics that may moderate competitive response, we also group the categories into five broad classes, health remedies, cleaners, personal care products, paper products, and food products, and include intercept and slope dummies for them:

\[ M_{mixch_{kict}} = \alpha_0 + \alpha_{k1} Self_{kic} + \alpha_{k2} Small_{ic} + \alpha_{k3} Mid_{ic} + \alpha_{k4} Conc_{c} + \alpha_{k5} Nummkt_{i} + \alpha_{k6} Col_{ic} + \alpha_{k7} Lev_{ic} + \alpha_{k8} Gil_{ic} + \alpha_{k9} Health_{c} + \alpha_{k10} Cleaner_{c} + \alpha_{k11} Personal_{c} + \alpha_{k12} Paper_{c} + (\beta_{k1} + \beta_{k2} Self_{kic} + \beta_{k3} Small_{ic} + \beta_{k4} Mid_{ic}) \]

where:

- \( Self_{kic} \) = Self-elasticity of firm \( i \) in category \( c \) with respect to marketing mix variable \( k \), estimated from the market share response model;
- \( Conc_{c} \) = Concentration of category \( c \), equal to market share of top three firms;
- \( Nummkt_{ic} \) = Number of product categories in which firm \( i \) competes with P&G;
- \( Col_{ic} \) = 1 if firm \( i \) in category \( c \) is Colgate Palmolive, 0 otherwise;
- \( Lev_{ic} \) = 1 if firm \( i \) in category \( c \) is Unilever, 0 otherwise;
- \( Gil_{ic} \) = 1 if firm \( i \) in category \( c \) is Gillette, 0 otherwise;
- \( Health_{c} \) = 1 if category \( c \) is a health remedy, 0 otherwise;
- \( Cleaner_{c} \) = 1 if category \( c \) is a cleaning product, 0 otherwise;
- \( Personal_{c} \) = 1 if category \( c \) is a personal care product, 0 otherwise;
- \( Paper_{c} \) = 1 if category \( c \) is a paper product, 0 otherwise.

To ensure that we have enough observations to reliably estimate a company effect, we include dummy variables only for companies that participate in at least 5 of the product categories in our study.
5.2 Results

The system of four competitive reaction equations is estimated using observations on P&G’s competitors in all the product categories. We use seemingly unrelated regression since the error terms across the four equations may be correlated (Johnston and DiNardo 1997). The system-weighted $R^2$ for the four equations is 0.23. Table 7 summarizes the results of tests to determine whether market share elasticities, structural, firm-specific, and category class-specific factors have significant explanatory power. Each of these groups of factors is significant in all four competitive reaction equations, with the exception of the firm-specific effect in the advertising reaction equation. Thus while a significant portion of competitor response is due to self- and cross-elasticities and structural factors, a significant portion is also firm-specific.

Table 7 summarizes the results of tests to determine whether market share elasticities, structural, firm-specific, and category class-specific factors have significant explanatory power. Each of these groups of factors is significant in all four competitive reaction equations, with the exception of the firm-specific effect in the advertising reaction equation. Thus while a significant portion of competitor response is due to self- and cross-elasticities and structural factors, a significant portion is also firm-specific.

Figure 3 shows the response of the average competitor as a function of Shreff. The length of the line represents the range of Shreff in the sample. The fact that the price, advertising, and coupon intercepts are close to zero shows that competitors did not change these variables much during the period of study if they were unaffected by P&G’s policy change. The deal intercept, however, is strongly positive, showing that competitors generally increased deals during this period even if they were unaffected by P&G.

We thank an anonymous reviewer for suggesting that we add these dummy variables.

We also estimate the competitive reaction model using one-year lags. There is no improvement in overall model fit and none of the coefficient estimates change significantly.
The non-zero slopes show that competitors generally respond depending on how strongly they are affected by P&G. Interestingly, competitors are competitive on deals, increasingly so when they benefit from P&G’s policy change. This is also reflected in price response: competitors’ prices decrease as they benefit from P&G’s policy change. Companies appear to use price and deals to take advantage of an opportunity for increasing market share. Response on advertising and coupons is quite different. Competitors cut advertising and coupons if they benefit from P&G’s policy change, perhaps using the opportunity to save money.

<Insert Table 8 About Here>

Table 8 shows several interesting differences in competitive response due to structural and firm-specific factors. For instance, competitors who have multi-market contact with P&G tend to follow P&G’s lead on price and advertising more than others when they benefit from P&G’s move. Small competitors react in the opposite way, however. They reduce price and advertising more than others if they are affected positively. In addition, small brands are more likely than others to increase deals when they benefit from P&G’s move. These findings suggest that small brands are less likely to follow P&G’s move, whereas firms with multi-market contacts are more likely to follow. Over and above the differences in response that can be accounted for by market share elasticities and structural factors, response differs by company, lending support to the resource-based view of the firm. For instance, Gillette’s reactions are less related to how much it is affected by P&G’s policy change than Lever and Colgate’s reactions, particularly on price and advertising.

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18 This is partly attributable to the fact that a given share point change translates to a much larger percentage of a small brand's market share than a large brand's market share.
In summary, theory tells us that market share elasticities, structural factors, and firm-specific effects matter, and they do. Theory does not predict the direction of influence of these factors, and we find that there are several interesting differences in their influence across marketing mix variables. These differences may be partly due to the fact that the initiating firm’s move is cooperative on some variables (deals and coupons), and competitive on others (advertising). There may be other issues at play, however, such as the costs and profitability of various marketing mix variables. Our research points to the need for further theory development to better understand how elasticities, structural factors, and firm-specific factors influence competitive response.

6. Net Impact of a Sustained Change in Advertising and Promotion Policy

6.1 Impact on Market Share

In order to understand the impact of the value pricing strategy on P&G’s market share more fully, we use P&G's elasticities, obtained from the consumer response model, together with the changes made by P&G and the competition in each of the four marketing mix variables, to formally trace the overall impact on the three components of P&G's market share -- PEN, SOR, and USE. Table 9 suggests the following:

<Insert Table 9 About Here>

- On average, P&G suffered a predicted 16% loss in market share across the 24 categories in our study.\(^1^9\) The decrease in share is due mainly to a predicted 17% decrease in penetration. SOR and USE are virtually unchanged. The hoped-for increase in SOR to offset the loss in penetration did not materialize.

\(^1^9\) The actual loss was 18%, so the model represents share changes pretty well.
• The loss in penetration is attributable to P&G's severe cuts in coupons and deals, and the consequent increase in net price.

• The increase in net price hurt SOR and USE. The deal and coupon cuts did not increase SOR as might have been expected if cutting promotions strengthened customer loyalty.

• The increase in deals by competitors exacerbated P&G's loss in penetration and also had a negative impact on SOR. This negative impact of competitor deal increases is just as strong as the negative impact of P&G's own deal cuts.

• The competition’s cuts in couponing and increases in net price helped P&G’s SOR, and offset the decrements in SOR resulting from P&G’s increase in net price. But, the competition’s coupon cuts did not help enough, and P&G still lost penetration.

• Neither P&G's own advertising spending increases nor the competition's smaller increases had much effect, since both self- and cross-advertising elasticities are quite weak.

6.2 Profit Implications

We use our findings, along with some assumptions, to examine the potential profit impact of Value Pricing. Our goal is not to evaluate P&G’s strategy, but to explore consequences other than market share that follow from a prolonged increase in advertising and decrease in promotion. We use a simple margin calculation as in Hoch, Dreze, and Purk (1994):

\[
\text{Profit} = \text{Total Revenue} - \text{Total Variable Costs} - \text{Fixed Costs}
\]
\[
= [(\text{Manufacturer Price})(\text{Unit Sales})] - [(\text{Variable Cost per unit})(\text{Unit Sales})] - \text{[Fixed Costs]}
\]
First, the percentage changes in price and market share in Tables 1 and 9 show that total revenue should remain almost unchanged:\(^{20}\)
\[
\text{Total Revenue}_{96} = [(0.818)(\text{Sales}_{90})] \cdot [(1.204)(\text{Price}_{90})] = (0.9849)(\text{Total Revenue}_{90})
\]  
(8)

Second, under the conservative scenario that variable costs per unit do not change, the 18.2\% reduction in total units sold leads to a corresponding reduction in total variable costs:\(^{21}\)
\[
\text{Total Variable Costs}_{96} = (0.818)(\text{Variable Cost per Unit})(\text{Sales}_{90})
\]  
(9)

Thus the gross margins in 1990 and 1996 respectively would be:
\[
\text{Gross Margin}_{90} = (\text{Sales}_{90})(\text{Price}_{90}) - (\text{Variable Cost per Unit})(\text{Sales}_{90})
\]  
(10)
\[
\text{Gross Margin}_{96} = (0.9849)(\text{Sales}_{90})(\text{Price}_{90}) - (0.818)(\text{Variable Cost per Unit})(\text{Sales}_{90})
\]  
(11)

Equation (11) shows that gross margin in 1996 would be higher than in 1990, especially if variable costs are large.

One question is whether this increase in gross margin would be enough to cover the increased fixed costs of advertising. We obtained information about P&G's financials from COMPUSTAT's annual data file. P&G's worldwide sales and advertising were about $24 billion and $2 billion respectively in 1990, with the US accounting for 62\% of sales, i.e., $15 billion. Further, P&G's cost of goods sold as a percent of revenue was approximately 57\% in 1990. Thus,

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\(^{20}\) This assumes that total category sales in the market does not change (a reasonable assumption for mature categories) and the percentage change in retail selling price is equal to the percentage change in P&G's manufacturer selling price.

\(^{21}\) It is likely, of course, that variable costs per unit did decrease due to operating efficiencies.
we can estimate variable cost per unit as 0.57 times the 1990 price, and gross margins in 1990 and 1996 can be written as:

\[ \text{Gross Margin}_{90} = (\text{Sales}_{90})(\text{Price}_{90}) - (0.57)(\text{Sales}_{90})(\text{Price}_{90}) = (0.43)(\text{Sales}_{90})(\text{Price}_{90}) \quad (12) \]

\[ \text{Gross Margin}_{96} = (0.9849)(\text{Sales}_{90})(\text{Price}_{90}) - (0.818)(0.57)(\text{Sales}_{90})(\text{Price}_{90}) = (0.519)(\text{Sales}_{90})(\text{Price}_{90}) = (1.21)(\text{Gross Margin}_{90}) \quad (13) \]

Thus, P&G's US gross margin can be expected to have increased by about $1.35 billion as a result of value pricing (0.21 times 0.43 times $15 B). Assuming that the ratio of US to worldwide advertising is the same as the ratio of sales, US advertising in 1990 would be about $1.24 billion (0.62 times $2 B), and the increase in fixed costs due to a 21% increase in advertising would be $0.26 billion (0.21 times $1.24 B). Thus, the increase in gross margin would be more than enough to cover the increase in fixed advertising costs. According to our calculations, net profit would increase by $1.09 billion ($1.35 B minus $0.26 B).\footnote{We do not compare these figures with P&G's reported earnings because our data cover only U.S. grocery channel sales for these 24 categories and also because we do not have information on cost cutting and other activities that P&G undertook during this period.} In short, it is quite plausible that P&G gave up share points in return for profits.

7. Conclusion

We have used Procter & Gamble’s value pricing strategy to study the impact of a major and sustained change in advertising and promotion policy. We focus on the role of advertising and promotion in attracting and retaining customers, on the factors that influence competitive response, and on how these effects combine to determine overall market share impact. Based on previous theory and empirical work, we develop a framework for assessing this impact that
integrates both consumer and competitive response. We test this framework using data on 118 brands in 24 categories in which P&G competed over a seven-year period.

7.1 Summary of Findings
Our first research question relates to how advertising and promotion work in attracting and retaining customers. We find the following:

• Deals and coupons increase penetration and have a zero or somewhat positive impact on customer retention as measured by SOR and USE.
• Advertising appears to work primarily by increasing penetration but the effect is weaker than that of promotion. We find little evidence that advertising increases SOR or USE among the average brand’s existing users.
• Promotion has a stronger direct impact on share than advertising for the average packaged goods brand. This is a common finding in both micro and macro short-term studies (e.g., Tellis 1988; Boulding, Lee, and Staelin 1994), that has not been demonstrated previously in the case of a major and sustained policy change.

Our second research question concerns the relative roles of market share response, structural factors, and firm-specific effects in determining competitor response. We find:

• Competitors' reactions to a sustained change in advertising and promotion policy by a market leader vary with the degree to which their market share is affected. Reactions also vary by structural factors such as the market share position of the competitor and the number of markets in which it competes with the initiator of the policy change.
• Even after accounting for market share response elasticities and structural factors, there are still firm-specific effects in competitor reactions.
• Competitors do not react the same way on all marketing instruments. In this case, competitors tended to decrease advertising and coupons but used deals to gain market share even when they were benefiting from P&G’s policy change.

Our third question is how consumer and competitor response combine to determine overall market share impact. We find that the net impact is a decrease in market share for the initiating company, although it is plausible that its profits increased. The loss in penetration resulting from promotion cuts is not offset by increases in SOR or by competitive reactions. The effect of promotion on share is greater than that of advertising for established brands, though the reverse is true for small brands. The implication is that cuts in promotion, even if coupled with increases in advertising, will not grow market share for the average established brand in mature consumer goods categories.

7.2 Limitations and Further Research

While these findings are both important and stimulating, our study does have some limitations. First, we focus on a policy change that involves significant changes in advertising and promotion. We do not have data on any changes P&G may have made in variables such as product assortment or new product development, so we cannot speak to their impact. Similarly, data limitations preclude the use of moderators such as sales force, distribution, and ad copy in our consumer response model (see Gatignon 1993). While our purpose is not to study these moderators per se, including them might have generated additional insights. Nor do we have measures of firm-specific factors such as culture and management skill, although the statistical
significance of the dummy variable surrogates we use for these factors should encourage future research in this area.

Second, we cannot make conclusive statements about the impact of the strategy change on profitability in the absence of data on P&G's manufacturer price and cost data. This would be an important area for future research if relevant data become available. Still, sales are a key objective for most companies including P&G (see Kristofferson and Lal 1996 a, b; Brooker 1999; Fairclough 1999), so we believe our analysis of market share is important.

Third, as noted earlier, our analysis pertains to sales made through the US grocery channel, and alternative channels such as mass and discount merchandisers have become more important in recent years. We note, however, that the shift to alternative channels is occurring for other large competitors as well.

Fourth, we assume that P&G’s adoption and consistent application of Value Pricing is exogenous, i.e., P&G did not react to competition. With only seven time series data points, we cannot investigate this issue. Trends in P&G’s marketing mix over the seven-year period, however, do not reveal any major pattern shifts or reversals. If a reversal in strategy does occur in the future, it would provide another valuable opportunity to examine market response.

Finally, our analysis is based on aggregate data. There is a trade-off between the micro approach to examining individual brands, categories, or markets, and the broad-based, strategic view provided by our analysis and others like it. We believe both approaches contribute to
understanding market response and should be viewed as complementing one another. Importantly, many of our results are consistent with micro studies, and the product categories in which we are able to replicate our analysis with disaggregate quarterly data also corroborate our findings. Still, it would be valuable to examine differences between our conclusions and those based on more disaggregate data, should those data be available. Such data would also enable researchers to study brand and category differences in market response in more detail and to study interactions between marketing mix variables, e.g., the effect of a brand's advertising and promotion on its price elasticity (e.g., Gatignon 1993; Jedidi, Mela, and Gupta 1999).

7.3 Implications for Researchers and Managers

While acknowledging these limitations, we believe our results are provocative and raise several important questions and implications for researchers and managers:

• What is the correspondence between share of requirements and brand loyalty? A sustained decrease in promotion and increase in advertising should have enhanced P&G's SOR through increased brand loyalty. However, advertising did not improve SOR. Further, the net impact of cutting deals and coupons, and the concomitant increase in net price paid, was to decrease SOR. We believe this is due to the “retention” role of price promotions – in a competitive environment, an existing user is more likely to re-purchase the brand when it is on promotion than when it is not. But, even if promotions do not hurt SOR, underlying attitudinal loyalty could be diminishing. It is important for researchers to investigate this further (e.g., Kopalle, Mela, and Marsh 1999), since SOR is a commonly used indicator of brand loyalty (e.g., Bhattacharya et al. 1996; Bhattacharya 1997).
• **What does advertising do?** We find that the direct effect of advertising on the components of market share is weak for all but small brands. This lack of effectiveness could be attributable to execution (e.g., Lodish et al. 1995a) or to the way advertising works for established brands in mature markets. It is important to have a base level of advertising, but even substantial increases over that base level may not generate dramatic gains in market share for established brands. Our results are consistent with Tellis (1988), Deighton, Henderson, and Neslin (1994), and Batra et al. (1995) even though we were working with a substantial increase in advertising. In any event, more research is needed on how and in what circumstances advertising works.

• **Market share elasticities, structural, and firm-specific factors play a role in competitor response.** Managers who try to anticipate competitor response must not only know how their policy change will affect competitors' market share, but also consider structural issues such as the market share position of their competitors and in how many markets they compete. Further, competitor-specific resources, capabilities, and culture also determine the response. Our findings strongly suggest the need for theory that can predict not only the factors that determine competitive response but also the direction of their influence.

• **Competitors' response to policy changes is not uniform across marketing instruments.** The reasons for this need to be sorted out. An obvious potential explanation would be differences in profitability across marketing instruments, but there may also be some organizational factors at work. For example, it may be easier for managers to reallocate their total marketing budgets than to change them drastically.

• **Researchers should make use of major policy changes.** Dekimpe and Hanssens (1995) note that most markets are stationary which precludes the finding of persistent effects of
marketing mix variables. The substantial changes in marketing mix variables as well as market share that accompany a major policy change provide a valuable opportunity to test for persistence. Jedidi, Mela, and Gupta (1999) do not find significant long-term effects of advertising on price or promotion sensitivity. Perhaps such effects can be detected with more substantial variation in advertising. The P&G Value Pricing policy is one example of a policy change, as are the Post Cereal price rollback of 1998, and Marlboro’s earlier price cutback. We conclude with a call for making use of these strategic policy changes to better understand the impact of marketing strategy.
# TABLE 1
VALUE PRICING: AN OVERVIEW

<table>
<thead>
<tr>
<th>Marketing Mix Variable</th>
<th>P&amp;G</th>
<th>All Competition</th>
<th>Colgate</th>
<th>Unilever</th>
<th>Gillette</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertising</td>
<td>+20.7%</td>
<td>+6.2%</td>
<td>+67.3%</td>
<td>+9.0%</td>
<td>+68.8%</td>
</tr>
<tr>
<td>Deals</td>
<td>-15.7%</td>
<td>+12.6%</td>
<td>+39.7%</td>
<td>+2.2%</td>
<td>+11.5%</td>
</tr>
<tr>
<td>Coupons</td>
<td>-54.3%</td>
<td>-17.3%</td>
<td>+24.0%</td>
<td>-32.0%</td>
<td>+127.8%</td>
</tr>
<tr>
<td>Net Price</td>
<td>+20.4%</td>
<td>+8.4%</td>
<td>+2.5%</td>
<td>+11.5%</td>
<td>-7.7%</td>
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# TABLE 2
CONSUMER RESPONSE MODEL: SUMMARY
(569 observations)

<table>
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<th>Statistic</th>
<th>No. of Coefficients</th>
<th>Dependent Variable</th>
<th>PEN</th>
<th>USE</th>
<th>SOR</th>
<th>Share</th>
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<tr>
<td>Adjusted R² for Full Model</td>
<td>56</td>
<td></td>
<td>0.447</td>
<td>0.354</td>
<td>0.430</td>
<td>0.435</td>
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<tr>
<td>F-Stat for Full Model</td>
<td>56</td>
<td></td>
<td>9.19*</td>
<td>6.55*</td>
<td>8.64*</td>
<td>8.82*</td>
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<tr>
<td>F-Stat for Category Characteristics</td>
<td>32</td>
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<td>4.31*</td>
<td>2.97*</td>
<td>6.73*</td>
<td>3.48*</td>
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<tr>
<td>F-Stat for Brand Market Share Position</td>
<td>16</td>
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<td>9.51*</td>
<td>5.59*</td>
<td>6.05*</td>
<td>10.81*</td>
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</table>

*p < 0.01
**TABLE 3**  
**AVERAGE MARKET SHARE ELASTICITIES OF SAMPLE***

<table>
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<tr>
<th>Independent Variable</th>
<th>Average Elasticities for</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PEN</td>
</tr>
<tr>
<td>Price</td>
<td>-0.065</td>
</tr>
<tr>
<td>Advertising</td>
<td>0.044</td>
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<tr>
<td>Deals</td>
<td>0.162</td>
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<td>Coupons</td>
<td>0.133</td>
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<tr>
<td>Competitor Price</td>
<td>-0.027</td>
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<tr>
<td>Competitor Advertising</td>
<td>-0.065</td>
</tr>
<tr>
<td>Competitor Deals</td>
<td>-0.106</td>
</tr>
<tr>
<td>Competitor Coupons</td>
<td>-0.116</td>
</tr>
</tbody>
</table>

* Averaged across 118 brands in 24 categories.
FIGURE 2
OVERVIEW OF VALUE PRICING

P&G's Trends

Competitors' Trends

Year

Advertising  Deals  Coupons  Net Price

Year

Advertising  Deals  Coupons  Net Price
FIGURE 3
AVERAGE COMPETITIVE REACTIONS

Price Change

Advertising Change

Deal Change

Coupon Change
APPENDIX 1
VARIABLES AND THEIR DEFINITIONS

I. Variables Obtained Directly From IRI Market Fact Book:

- **Market Share**: % Share of Category Volume.
- **Household Penetration**: % of all households that made at least one purchase of the brand.
- **Share of Category Requirements (SOR)**: Among households that bought the brand, the percentage of their total category purchases represented by the brand.
- **Net Price Per Unit Volume**: The average price paid per unit volume, reflecting all promotional activity.
- **% Volume on Deal**: % of brand sales that were accompanied by some kind of deal, e.g., display, feature, temporary price reduction (TPR).
- **% Volume with Manufacturer Coupon**: % of brand sales that were made with a manufacturer coupon.
- **Average % Price Cut**: The average savings due to TPR or coupon redemption.

II. New Variables Computed From IRI Market Fact Book Data:

- **Shelf Price**: $\frac{\text{Net Price} \times 100}{(\% \text{ on TPR or Coupon} \times \text{PriceCut/100}) + (100 - \% \text{on TPR or Coupon})}$
- **Penetration Index (PEN)**: Brand Penetration/Category Penetration.
- **Category Usage (USE)**: Average Category Purchase per Brand Buyer/Average Category Purchase per Category Buyer.
- **Market Concentration**: Share of Top Three Brands in the Market.
- **Number of Market Contacts**: Number of product categories (out of 24) in which a firm competes with P&G.

III. Media Advertising Spending from Leading National Advertisers: In tens of millions of dollars. Minimum of advertising spending from remaining years used if company not found in LNA in a given year.

IV. Category Stockpileability: Factor scores for each category provided by Narasimhan, Neslin, and Sen (1996).
APPENDIX 2
LIST OF PRODUCT CATEGORIES

• HEALTH REMEDIES

1. COLD/ALLERGY/SINUS LIQUID
2. COLD/ALLERGY/SINUS TABLETS
3. COUGH SYRUP

• CLEANERS

4. DISHWASHER DETERGENT
5. DISHWASHING LIQUID
6. DRY BLEACH
7. LIQUID LAUNDRY DETERGENT
8. PWD LAUNDRY DETERGENT

• PERSONAL CARE

9. HAIR CONDITIONER
10. HAIR SPRAY
11. SHAMPOO
12. BARSOAP
13. LIQUID SOAP
14. MOUTHWASH
15. TOOTHPASTE
16. TOOTHBRUSHES

• PAPER

17. PAPER TOWELS
18. DIAPERS
19. FACIAL TISSUE
20. TOILET TISSUE

• FOOD

21. POTATO CHIPS
22. FROSTING
23. BROWNIE MIX
24. SHORTENING
REFERENCES


Brooker, Katrina (1999), "Can Procter & Gamble Change its Culture, Protect its Market Share, and Find the Next Tide?" *Fortune Magazine*, April 26, 146-152.


______, and _____ (1996b), "Value Pricing at Procter & Gamble (B)", Case Number M-284B, Graduate School of Business, Stanford University.


Ramaswamy, Venkatram, Hubert Gatignon, and David J. Reibstein (1994), "Competitive Marketing Behavior in Industrial Markets," *Journal of Marketing*, 58 (2), 45-


TABLE 9
THE NET IMPACT ON P&G's MARKET SHARE

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>P&amp;G Price</td>
<td>1.204</td>
<td>-0.129</td>
<td>0.976</td>
<td>-0.124</td>
<td>0.977</td>
<td>-0.295</td>
<td>0.947</td>
<td>-0.548</td>
<td>0.903</td>
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<td>P&amp;G Advertising</td>
<td>1.207</td>
<td>0.026</td>
<td>1.005</td>
<td>-0.001</td>
<td>1.000</td>
<td>-0.020</td>
<td>0.996</td>
<td>0.005</td>
<td>1.001</td>
</tr>
<tr>
<td>P&amp;G Deals</td>
<td>0.843</td>
<td>0.178</td>
<td>0.970</td>
<td>-0.021</td>
<td>1.004</td>
<td>0.012</td>
<td>0.998</td>
<td>0.169</td>
<td>0.972</td>
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<tr>
<td>P&amp;G Coupons</td>
<td>0.457</td>
<td>0.161</td>
<td>0.882</td>
<td>0.008</td>
<td>0.994</td>
<td>0.008</td>
<td>0.994</td>
<td>0.177</td>
<td>0.871</td>
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<td>Competitor Price</td>
<td>1.100</td>
<td>-0.161</td>
<td>0.985</td>
<td>0.026</td>
<td>1.003</td>
<td>0.439</td>
<td>1.043</td>
<td>0.304</td>
<td>1.029</td>
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<tr>
<td>Competitor Advtg.</td>
<td>1.063</td>
<td>-0.011</td>
<td>0.999</td>
<td>-0.012</td>
<td>0.999</td>
<td>-0.038</td>
<td>0.998</td>
<td>-0.061</td>
<td>0.996</td>
</tr>
<tr>
<td>Competitor Deals</td>
<td>1.131</td>
<td>-0.145</td>
<td>0.982</td>
<td>0.032</td>
<td>1.004</td>
<td>-0.087</td>
<td>0.989</td>
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<td>0.976</td>
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<td>Competitor Coupons</td>
<td>0.829</td>
<td>-0.080</td>
<td>1.015</td>
<td>0.026</td>
<td>0.995</td>
<td>-0.101</td>
<td>1.019</td>
<td>-0.155</td>
<td>1.030</td>
</tr>
<tr>
<td>Intercept (e$^α$)</td>
<td>--</td>
<td>1.015</td>
<td>1.015</td>
<td>1.022</td>
<td>1.022</td>
<td>1.030</td>
<td>1.030</td>
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<td>1.068</td>
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<td>Predicted Change Ratio</td>
<td><strong>0.835</strong></td>
<td><strong>0.997</strong></td>
<td><strong>1.010</strong></td>
<td><strong>0.841</strong></td>
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</tr>
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</table>
FIGURE 1
CONCEPTUAL FRAMEWORK

- Brand Market Share Position
- Category Characteristics

Own
Price
Advertising
Deals
Coupons

Market Share
\( = \text{PEN} \times \text{SOR} \times \text{USE} \)

Competitors'
Price
Advertising
Deals
Coupons

- Market Share Elasticities
- Structural Factors
- Firm-Specific Effects
# TABLE 5

## AVERAGE MARKET SHARE ELASTICITIES BY SIZE

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Own Price</th>
<th>Own Advertising</th>
<th>Own Deals</th>
<th>Own Coupons</th>
<th>Comp. Price</th>
<th>Comp. Advtg.</th>
<th>Comp. Deals</th>
<th>Comp. Coupons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Brands</td>
<td>-0.696</td>
<td>0.117</td>
<td>0.078</td>
<td>-0.001</td>
<td>3.220</td>
<td>-0.428</td>
<td>0.377</td>
<td>-0.500</td>
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<tr>
<td>Mid-Sized Brands</td>
<td>-0.481</td>
<td>0.024</td>
<td>0.018</td>
<td>0.132</td>
<td>-0.061</td>
<td>-0.038</td>
<td>-0.312</td>
<td>-0.090</td>
</tr>
<tr>
<td>Large Brands</td>
<td>-0.517</td>
<td>-0.017</td>
<td>0.327</td>
<td>0.266</td>
<td>0.058</td>
<td>-0.001</td>
<td>-0.210</td>
<td>-0.166</td>
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# TABLE 6

## MARKET SHARE ELASTICITIES: DISAGGREGATE DATA

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<th>Elasticity</th>
<th>Mean Value for</th>
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<tr>
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<tr>
<td>Own Price</td>
<td>-1.119</td>
</tr>
<tr>
<td>Own Promotion</td>
<td>0.139</td>
</tr>
<tr>
<td>Own Advertising</td>
<td>0.035</td>
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<tr>
<td>Competitive Price</td>
<td>1.700</td>
</tr>
<tr>
<td>Competitive Promotion</td>
<td>-0.143</td>
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<tr>
<td>Competitive Advertising</td>
<td>-0.048</td>
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### TABLE 7
COMPETITIVE REACTION MODEL: SUMMARY
(376 observations)

<table>
<thead>
<tr>
<th>F-stat for Impact of</th>
<th>No of Coefficients</th>
<th>Competitive Reaction Variable</th>
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<td></td>
<td></td>
<td>Price</td>
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<td>Market Share Elasticities</td>
<td>14</td>
<td>4.55*</td>
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<tr>
<td>Structural Factors</td>
<td>8</td>
<td>4.34*</td>
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<tr>
<td>Firm-Specific</td>
<td>6</td>
<td>3.71*</td>
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<tr>
<td>Category Class-Specific</td>
<td>8</td>
<td>6.26*</td>
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</table>

*p < 0.05; **p < 0.10; ***p < 0.15
TABLE 8

ESTIMATES OF COMPETITIVE REACTION MODEL

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable</th>
<th>Price Change</th>
<th>Advertising Change</th>
<th>Deal Change</th>
<th>Coupon Change</th>
</tr>
</thead>
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<tr>
<td>Intercept</td>
<td></td>
<td>0.148</td>
<td>-0.137</td>
<td>8.198*</td>
<td>4.514</td>
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<td>Self Elasticity</td>
<td></td>
<td>0.150**</td>
<td>-3.223*</td>
<td>9.586*</td>
<td>16.400***</td>
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<td>Colgate</td>
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<td>0.015</td>
<td>-0.106</td>
<td>10.592*</td>
<td>16.527*</td>
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<td>Lever</td>
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<td>-0.283</td>
<td>6.293</td>
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<td>-0.240</td>
<td>7.195*</td>
<td>18.855*</td>
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<td>0.194*</td>
<td>0.350***</td>
<td>5.358*</td>
<td>4.721***</td>
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<tr>
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<td>0.046</td>
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<td>5.195*</td>
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<td>0.378**</td>
<td>-11.193*</td>
<td>-6.002***</td>
</tr>
<tr>
<td>Cleaners</td>
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<td>-0.004</td>
<td>-0.312**</td>
<td>-1.921</td>
<td>5.511**</td>
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<tr>
<td>Personal Care</td>
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<td>0.076</td>
<td>-10.032*</td>
<td>0.337</td>
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<td>0.025</td>
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<td>No. of Market Contacts</td>
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<td>-0.011</td>
<td>0.063</td>
<td>-0.452</td>
<td>-3.477*</td>
</tr>
<tr>
<td>Concentration</td>
<td></td>
<td>-0.002</td>
<td>0.001</td>
<td>-0.028</td>
<td>-0.074***</td>
</tr>
<tr>
<td>Shreff</td>
<td></td>
<td>-0.021</td>
<td>-0.023</td>
<td>8.797*</td>
<td>-3.176</td>
</tr>
<tr>
<td>Self Elasticity x Shreff</td>
<td></td>
<td>-0.131**</td>
<td>-0.370</td>
<td>2.161</td>
<td>7.261</td>
</tr>
<tr>
<td>Colgate x Shreff</td>
<td></td>
<td>-0.374*</td>
<td>-0.515*</td>
<td>2.447</td>
<td>-3.306</td>
</tr>
<tr>
<td>Lever x Shreff</td>
<td></td>
<td>-0.760*</td>
<td>-0.743**</td>
<td>0.477</td>
<td>-2.765</td>
</tr>
<tr>
<td>Gillette x Shreff</td>
<td></td>
<td>-0.058</td>
<td>-0.045</td>
<td>2.061</td>
<td>-2.886</td>
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<tr>
<td>Small x Shreff</td>
<td></td>
<td>-0.308*</td>
<td>-0.952*</td>
<td>11.287*</td>
<td>-0.171</td>
</tr>
<tr>
<td>Medium x Shreff</td>
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<td>-0.105*</td>
<td>-0.176*</td>
<td>-0.731</td>
<td>2.641**</td>
</tr>
<tr>
<td>Health Remedies x Shreff</td>
<td></td>
<td>-0.142*</td>
<td>-0.206***</td>
<td>-2.716**</td>
<td>0.478</td>
</tr>
<tr>
<td>Cleaners x Shreff</td>
<td></td>
<td>0.067</td>
<td>-0.066</td>
<td>0.160</td>
<td>-3.256</td>
</tr>
<tr>
<td>Personal Care x Shreff</td>
<td></td>
<td>-0.255*</td>
<td>-0.218</td>
<td>-2.920</td>
<td>-2.328</td>
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<tr>
<td>Paper x Shreff</td>
<td></td>
<td>0.048</td>
<td>0.083</td>
<td>-1.950</td>
<td>-2.706</td>
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<tr>
<td>No. of Contacts x Shreff</td>
<td></td>
<td>0.110*</td>
<td>0.120*</td>
<td>-0.317</td>
<td>0.406</td>
</tr>
<tr>
<td>Concentration x Shreff</td>
<td></td>
<td>-0.003</td>
<td>-0.001</td>
<td>-0.079**</td>
<td>0.027</td>
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</table>

* Magnitude Change in Competitor's Marketing Mix Variable from 1990 to current year

\*p < 0.05; \**p < 0.10; \***p < 0.15
<table>
<thead>
<tr>
<th>Marketing Mix Variable</th>
<th>Main Effect</th>
<th>Interaction With</th>
<th>Small Brands</th>
<th>Mid-Sized Brands</th>
<th>Cat. Advtg</th>
<th>Cat. Deals</th>
<th>Stockpiling</th>
<th>Purchase Cycle</th>
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</thead>
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<td>Own Price</td>
<td>0.327</td>
<td></td>
<td>-0.230</td>
<td>0.033</td>
<td>0.133***</td>
<td>-0.010</td>
<td>1.281**</td>
<td>-0.012</td>
</tr>
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<td>Own Advertising</td>
<td>-0.289**</td>
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<td>0.141*</td>
<td>0.039</td>
<td>-0.014***</td>
<td>0.001</td>
<td>-0.074**</td>
<td>0.003**</td>
</tr>
<tr>
<td>Own Deal</td>
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<td>-0.236</td>
<td>-0.270***</td>
<td>0.147*</td>
<td>-0.018*</td>
<td>-0.011</td>
<td>-0.016*</td>
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<td>Own Coupon</td>
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<td>-0.266*</td>
<td>-0.143**</td>
<td>0.024*</td>
<td>-0.005**</td>
<td>0.253*</td>
<td>-0.000</td>
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<tr>
<td>Comp. Price</td>
<td>-1.036</td>
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<td>3.169*</td>
<td>-0.186</td>
<td>-0.319*</td>
<td>0.021</td>
<td>-1.042</td>
<td>0.014</td>
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<td>Comp. Advertising</td>
<td>0.357</td>
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<td>-0.428*</td>
<td>-0.026</td>
<td>0.021</td>
<td>-0.002</td>
<td>-0.065</td>
<td>-0.004</td>
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<td>0.606**</td>
<td>-0.090</td>
<td>0.005</td>
<td>0.001</td>
<td>-0.291</td>
<td>0.004</td>
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<tr>
<td>Comp. Coupon</td>
<td>-0.473</td>
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<td>-0.311*</td>
<td>0.108</td>
<td>0.038</td>
<td>0.002</td>
<td>-0.382*</td>
<td>0.003</td>
</tr>
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</table>

* p < 0.01; ** p < 0.05; *** p < 0.10.
### TABLE 5
AVERAGE MARKET SHARE ELASTICITIES BY SIZE

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Average Market Share Elasticities For</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Small Brands</td>
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<tr>
<td>Own Price</td>
<td>-0.696</td>
</tr>
<tr>
<td>Own Advertising</td>
<td>0.117</td>
</tr>
<tr>
<td>Own Deals</td>
<td>0.078</td>
</tr>
<tr>
<td>Own Coupons</td>
<td>-0.001</td>
</tr>
<tr>
<td>Comp. Price</td>
<td>3.220</td>
</tr>
<tr>
<td>Comp. Advtg.</td>
<td>-0.428</td>
</tr>
<tr>
<td>Comp. Deals</td>
<td>0.377</td>
</tr>
<tr>
<td>Comp. Coupons</td>
<td>-0.500</td>
</tr>
</tbody>
</table>

### TABLE 6
MARKET SHARE ELASTICITIES: DISAGGREGATE DATA

<table>
<thead>
<tr>
<th>Elasticity</th>
<th>Mean Value for</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Entire Sample</td>
</tr>
<tr>
<td>Own Price</td>
<td>-1.119</td>
</tr>
<tr>
<td>Own Promotion</td>
<td>0.139</td>
</tr>
<tr>
<td>Own Advertising</td>
<td>0.035</td>
</tr>
<tr>
<td>Competitive Price</td>
<td>1.700</td>
</tr>
<tr>
<td>Competitive Promotion</td>
<td>-0.143</td>
</tr>
<tr>
<td>Competitive Advertising</td>
<td>-0.048</td>
</tr>
</tbody>
</table>
## TABLE 7
**COMPETITIVE REACTION MODEL: SUMMARY**
(376 observations)

<table>
<thead>
<tr>
<th>F-stat for Impact of</th>
<th>No of Coefficients</th>
<th>Competitive Reaction Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Price</td>
</tr>
<tr>
<td>Market Share Elasticities</td>
<td>14</td>
<td>4.55*</td>
</tr>
<tr>
<td>Structural Factors</td>
<td>8</td>
<td>4.34*</td>
</tr>
<tr>
<td>Firm-Specific</td>
<td>6</td>
<td>3.71*</td>
</tr>
<tr>
<td>Category Class-Specific</td>
<td>8</td>
<td>6.26*</td>
</tr>
</tbody>
</table>

* *p < 0.05; **p < 0.10; ***p < 0.15
### TABLE 8
ESTIMATES OF COMPETITIVE REACTION MODEL

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable(^a)</th>
<th>Price Change</th>
<th>Advertising Change</th>
<th>Deal Change</th>
<th>Coupon Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>0.148</td>
<td>-0.137</td>
<td>8.198(^*)</td>
<td>4.514</td>
</tr>
<tr>
<td>Self Elasticity</td>
<td></td>
<td>0.150(^*)</td>
<td>-3.223(^*)</td>
<td>9.586(^*)</td>
<td>16.400(^***)</td>
</tr>
<tr>
<td>Colgate</td>
<td></td>
<td>0.015</td>
<td>-0.106</td>
<td>10.592(^*)</td>
<td>16.527(^*)</td>
</tr>
<tr>
<td>Lever</td>
<td></td>
<td>0.124</td>
<td>-0.283</td>
<td>6.293</td>
<td>18.857(^*)</td>
</tr>
<tr>
<td>Gillette</td>
<td></td>
<td>-0.136</td>
<td>-0.240</td>
<td>7.195(^*)</td>
<td>18.855(^*)</td>
</tr>
<tr>
<td>Small</td>
<td></td>
<td>0.194(^*)</td>
<td>0.350(^***)</td>
<td>5.358(^*)</td>
<td>4.721(^***)</td>
</tr>
<tr>
<td>Medium</td>
<td></td>
<td>0.046</td>
<td>-0.029</td>
<td>1.697</td>
<td>5.195(^*)</td>
</tr>
<tr>
<td>Health Remedies</td>
<td></td>
<td>0.327(^*)</td>
<td>0.378(^**)</td>
<td>-11.193(^3)</td>
<td>-6.002(^***)</td>
</tr>
<tr>
<td>Cleaners</td>
<td></td>
<td>-0.004</td>
<td>-0.312(^**)</td>
<td>-1.921</td>
<td>5.511(^**)</td>
</tr>
<tr>
<td>Personal Care</td>
<td></td>
<td>-0.026</td>
<td>0.076</td>
<td>-10.032(^*)</td>
<td>0.337</td>
</tr>
<tr>
<td>Paper</td>
<td></td>
<td>-0.034</td>
<td>0.025</td>
<td>-5.092(^*)</td>
<td>1.480</td>
</tr>
<tr>
<td>No. of Market Contacts</td>
<td></td>
<td>-0.011</td>
<td>0.063</td>
<td>-0.452</td>
<td>-3.477(^*)</td>
</tr>
<tr>
<td>Concentration</td>
<td></td>
<td>-0.002</td>
<td>0.001</td>
<td>-0.028</td>
<td>-0.074(^***)</td>
</tr>
<tr>
<td>Shreff</td>
<td></td>
<td>-0.021</td>
<td>-0.023</td>
<td>8.797(^*)</td>
<td>-3.176</td>
</tr>
<tr>
<td>Self Elasticity x Shreff</td>
<td></td>
<td>-0.131(^**)</td>
<td>-0.370</td>
<td>2.161</td>
<td>7.261</td>
</tr>
<tr>
<td>Colgate x Shreff</td>
<td></td>
<td>-0.374(^*)</td>
<td>-0.515(^*)</td>
<td>2.447</td>
<td>-3.306</td>
</tr>
<tr>
<td>Lever x Shreff</td>
<td></td>
<td>-0.760(^*)</td>
<td>-0.743(^**)</td>
<td>0.477</td>
<td>-2.765</td>
</tr>
<tr>
<td>Gillette x Shreff</td>
<td></td>
<td>-0.058</td>
<td>-0.045</td>
<td>2.061</td>
<td>-2.886</td>
</tr>
<tr>
<td>Small x Shreff</td>
<td></td>
<td>-0.308(^*)</td>
<td>-0.952(^*)</td>
<td>11.287(^*)</td>
<td>-0.171</td>
</tr>
<tr>
<td>Medium x Shreff</td>
<td></td>
<td>-0.105(^*)</td>
<td>-0.176(^*)</td>
<td>-0.731</td>
<td>2.641(^**)</td>
</tr>
<tr>
<td>Health Remedies x Shreff</td>
<td></td>
<td>-0.142(^*)</td>
<td>-0.206(^***)</td>
<td>-2.716(^**)</td>
<td>0.478</td>
</tr>
<tr>
<td>Cleaners x Shreff</td>
<td></td>
<td>0.067</td>
<td>-0.066</td>
<td>0.160</td>
<td>-3.256</td>
</tr>
<tr>
<td>Personal Care x Shreff</td>
<td></td>
<td>-0.255(^*)</td>
<td>-0.218</td>
<td>-2.920</td>
<td>-2.328</td>
</tr>
<tr>
<td>Paper x Shreff</td>
<td></td>
<td>0.048</td>
<td>0.083</td>
<td>-1.950</td>
<td>-2.706</td>
</tr>
<tr>
<td>No. of Contacts x Shreff</td>
<td></td>
<td>0.110(^*)</td>
<td>0.120(^*)</td>
<td>-0.317</td>
<td>0.406</td>
</tr>
<tr>
<td>Concentration x Shreff</td>
<td></td>
<td>-0.003</td>
<td>-0.001</td>
<td>-0.079(^**)</td>
<td>0.027</td>
</tr>
</tbody>
</table>

* Magnitude Change in Competitor's Marketing Mix Variable from 1990 to current year
\(^*\) p < 0.05; \(^**\) p < 0.10; \(^***\) p < 0.15
### TABLE 9
THE NET IMPACT ON P&G's MARKET SHARE

<table>
<thead>
<tr>
<th>Variable</th>
<th>Change Ratio (1996/1990)</th>
<th>PEN</th>
<th>USE</th>
<th>SOR</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Elasticity</td>
<td>Impact</td>
<td>Elasticity</td>
<td>Impact</td>
</tr>
<tr>
<td>P&amp;G Price</td>
<td>1.204</td>
<td>-0.129</td>
<td>0.976</td>
<td>-0.124</td>
<td>0.977</td>
</tr>
<tr>
<td>P&amp;G Advertising</td>
<td>1.207</td>
<td>0.026</td>
<td>1.005</td>
<td>-0.001</td>
<td>1.000</td>
</tr>
<tr>
<td>P&amp;G Deals</td>
<td>0.843</td>
<td>0.178</td>
<td>0.970</td>
<td>-0.021</td>
<td>1.004</td>
</tr>
<tr>
<td>P&amp;G Coupons</td>
<td>0.457</td>
<td>0.161</td>
<td>0.882</td>
<td>0.008</td>
<td>0.994</td>
</tr>
<tr>
<td>Competitor Price</td>
<td>1.100</td>
<td>-0.161</td>
<td>0.985</td>
<td>0.026</td>
<td>1.003</td>
</tr>
<tr>
<td>Competitor Advtg.</td>
<td>1.063</td>
<td>-0.011</td>
<td>0.999</td>
<td>-0.012</td>
<td>0.999</td>
</tr>
<tr>
<td>Competitor Deals</td>
<td>1.131</td>
<td>-0.145</td>
<td>0.982</td>
<td>0.032</td>
<td>1.004</td>
</tr>
<tr>
<td>Competitor Coupons</td>
<td>0.829</td>
<td>-0.080</td>
<td>1.015</td>
<td>0.026</td>
<td>0.995</td>
</tr>
<tr>
<td>Intercept (e^α)</td>
<td>--</td>
<td>1.015</td>
<td>1.015</td>
<td>1.022</td>
<td>1.022</td>
</tr>
<tr>
<td>Predicted Change Ratio</td>
<td><strong>0.835</strong></td>
<td><strong>0.997</strong></td>
<td><strong>1.010</strong></td>
<td><strong>0.841</strong></td>
<td></td>
</tr>
</tbody>
</table>
FIGURE 1
CONCEPTUAL FRAMEWORK

- **Brand Market Share Position**
- **Category Characteristics**

• Own
  Price
  Advertising
  Deals
  Coupons

= PEN x SOR x USE

• Market Share Elasticities
• Structural Factors
• Firm-Specific Effects

• Competitors'
  Price
  Advertising
  Deals
  Coupons
FIGURE 2
OVERVIEW OF VALUE PRICING

P&G's Trends

Competitors' Trends

Year

Advertising  Deals  Coupons  Net Price

Year

Advertising  Deals  Coupons  Net Price
FIGURE 3
AVERAGE COMPETITIVE REACTIONS

Price Change

Advertising Change

Deal Change

Coupon Change
APPENDIX 1
VARIABLES AND THEIR DEFINITIONS

I. Variables Obtained Directly From IRI Market Fact Book:

• **Market Share**: % Share of Category Volume.

• **Household Penetration**: % of all households that made at least one purchase of the brand.

• **Share of Category Requirements (SOR)**: Among households that bought the brand, the percentage of their total category purchases represented by the brand.

• **Net Price Per Unit Volume**: The average price paid per unit volume, reflecting all promotional activity.

• **% Volume on Deal**: % of brand sales that were accompanied by some kind of deal, e.g., display, feature, temporary price reduction (TPR).

• **% Volume with Manufacturer Coupon**: % of brand sales that were made with a manufacturer coupon.

• **Average % Price Cut**: The average savings due to TPR or coupon redemption.

II. New Variables Computed From IRI Market Fact Book Data:

• **Shelf Price**:

\[
\text{Shelf Price} = \frac{\text{Net Price} \times 100}{(\% \text{ on TPR or Coupon} \times \text{PriceCut}/100) + (100 - \% \text{ on TPR or Coupon})}
\]

• **Penetration Index (PEN)**: Brand Penetration/Category Penetration.

• **Category Usage (USE)**: Average Category Purchase per Brand Buyer/Average Category Purchase per Category Buyer.

• **Market Concentration**: Share of Top Three Brands in the Market.

• **Number of Market Contacts**: Number of product categories (out of 24) in which a firm competes with P&G.

III. Media Advertising Spending from Leading National Advertisers: In tens of millions of dollars. Minimum of advertising spending from remaining years used if company not found in LNA in a given year.

IV. Category Stockpileability: Factor scores for each category provided by Narasimhan, Neslin, and Sen (1996).
APPENDIX 2
LIST OF PRODUCT CATEGORIES

- HEALTH REMEDIES

1. COLD/ALLERGY/SINUS LIQUID
2. COLD/ALLERGY/SINUS TABLETS
3. COUGH SYRUP

- CLEANERS

4. DISHWASHER DETERGENT
5. DISHWASHING LIQUID
6. DRY BLEACH
7. LIQUID LAUNDRY DETERGENT
8. PWD LAUNDRY DETERGENT

- PERSONAL CARE

9. HAIR CONDITIONER
10. HAIR SPRAY
11. SHAMPOO
12. BARSOAP
13. LIQUID SOAP
14. MOUTHWASH
15. TOOTHPASTE
16. TOOTH BRUSHES

- PAPER

17. PAPER TOWELS
18. DIAPERS
19. FACIAL TISSUE
20. TOILET TISSUE

- FOOD

21. POTATO CHIPS
22. FROSTING
23. BROWNIE MIX
24. SHORTENING
REFERENCES


Brooker, Katrina (1999), "Can Procter & Gamble Change its Culture, Protect its Market Share, and Find the Next Tide?" *Fortune Magazine*, April 26, 146-152.


______, and _____ (1996b), "Value Pricing at Procter & Gamble (B)", Case Number M-284B, Graduate School of Business, Stanford University.


Ramaswamy, Venkatram, Hubert Gatignon, and David J. Reibstein (1994), "Competitive Marketing Behavior in Industrial Markets," *Journal of Marketing*, 58 (2), 45-


