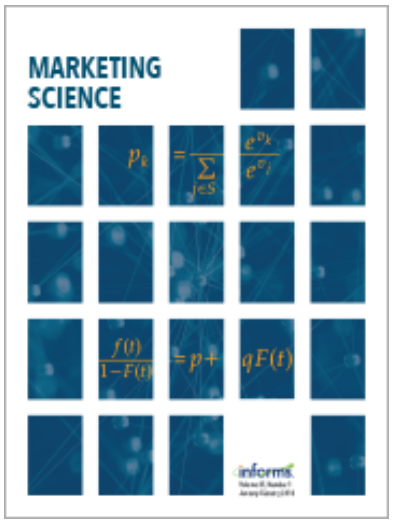

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Assessing the External Validity of Analytical Results from National Brand and Store Brand Competition Models

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This research has three objectives: (i) to compile analytical results on national brand and store brand marketing obtained from mathematical models, (ii) to assess the external validity of those results and thus the applicability of the results to practice, and (iii) to identify avenues for further research on national brand and store brand competition.

A total of 44 analytical results (29 related to retailer strategies and 15 related to manufacturer strategies) are compiled from a survey of literature published between 1966 and 2006. Three criteria are then used to assess the external validity of these results—robustness (R), empirical support (E), and credibility (C) (collectively, REC). Each result is quantitatively assessed (scored) using these three criteria. Robustness is measured as the total number of relevant market conditions for which the result has been shown to hold. Empirical support is measured as the number of independent empirical studies in which the findings are consistent with the analytical result. Credibility is measured as the believability of the theoretical result as perceived by experienced brand managers and retail executives.

Thus, the REC scoring approach represents a triangulation of perspectives—robustness (modeler perspective), empirical support (empiricist perspective), and credibility (managerial perspective). In particular, this research serves in part as a bridge between scholars and practitioners in the context of national brand and store brand marketing.

Key words: private labels; store brands; competitive strategies; mathematical models; marketing generalizations
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1. Introduction

Private labels or store brands are brands owned and marketed by retailers. Private labels, especially in grocery products, have witnessed considerable growth in the United States and other regions of the world. Dollar sales of private labels in the United States have grown at an average annual rate exceeding 7% during 1996–2005, or nearly twice the growth rate of national brands (Private Label Manufacturers Association 2006). Barring Costco (which has a 10% private label share), all the other top 12 world retailers have a private label dollar share ranging from 25% to 95% (Kumar and Steenkamp 2007, Table 1.1). As a result of this increased penetration, private labels are a topic of growing importance to retailers who own these brands and to national brand manufacturers who compete with them.

There has been a significant growth in academic research on private labels, consistent with the increased managerial interest. Beginning in the 1960s, survey-based research focused on identifying the characteristics of store brand consumers. In the 1980s, research focus shifted to estimating the effect of marketing actions on national brand and private label sales using scanner data. Concurrently, numerous research studies employed mathematical models to specify equilibrium national brand and store brand strategies when these brands compete with each other.

This paper reviews mathematical models of national brand and store brand competition. Over the last four decades, researchers from both marketing and economics have analyzed different mathematical models and provided potentially useful results. In particular, these researchers have analyzed game theoretic models and generated comparative statics results that specify how changes in an exogenous market variable (denoted as x) affect the endogenous variable (denoted as e) in the context of national brand and store brand marketing in grocery products. Our first objective is to compile the key findings from these analytical models in the form of $x \rightarrow e$ relationships for communication to researchers and managers.

Mathematical models often make restrictive assumptions about the market structure for analytical tractability. For example, modelers of national brand and store brand competition in grocery products often assume that there is a single manufacturer and one retailer in a market. Such assumptions enable researchers to better isolate and investigate the effect of an exogenous factor on an endogenous variable, i.e., $x \rightarrow e$ relationships. However, more applied researchers are also interested in knowing to what extent these theoretical results would hold under different conditions observed in the marketplace, i.e., external validity. Thus, the second objective of this research is to assess the external validity of analytical results using three criteria—robustness, empirical support, and credibility. Two articles (Berges-Sennou et al. 2004, Sayman and Raju 2007) have provided useful reviews of the private labels literature. However, their focus is neither on analytical models nor on the assessment of external validity.

The process of compiling the results from analytical models and assessing their external validity reveals gaps in the literature, both in terms of strategies of importance to managers that have not been considered, and in terms of real-world market conditions that have not been incorporated into the model structure. Therefore, a third objective of this paper is to elucidate several directions for future research.

In summary, this paper has three objectives: (i) to compile analytical results on national brand and store brand marketing obtained from mathematical models; (ii) to assess the external validity of those results and thus the applicability of the results to practice; and (iii) to identify avenues for further research on national brand and store brand competition. The remainder of this paper is organized as follows. Section 2 describes the criteria for assessment of external validity. Section 3 compiles the results and computes their external validity scores. Sections 4 and 5 discuss the results and offer several avenues for further research. Section 6 concludes by summarizing the key insights and future research directions.

2. External Validity Criteria

The central focus of this research is to ascertain the external validity of the analytical results on national brand and store brand marketing. In this context, we define external validity as the extent to which a theoretical result derived from an analytical model applies to conditions observed in the marketplace. We use three criteria—robustness (R), empirical support (E), and credibility (C) (collectively, REC)—for ascertaining the external validity. We first define these three criteria and then discuss the role each plays in the assessment of external validity.

2.1. Definition of Criteria

2.1.1. Robustness. The concept of robustness is used widely in academic and scientific research and relates to the notion of being powerful and sturdy. In marketing research, mathematical results are derived using certain assumptions about the marketplace. For example, in the interest of parsimony and analytical tractability, a researcher may assume that there is one manufacturer and one retailer in the market when deriving a theoretical result. If the result is also valid when there are two or more retailers in the market, then the result is said to be more robust than if it is not proven to apply under these conditions. Accordingly, we conceptually define robustness as *the extent to which an analytical result holds under a variety of market conditions observed in the marketplace*. We operationally define robustness as the total number of relevant market conditions for which the result has been shown to hold.

2.1.2. Empirical Support. Marketplace observations that are consistent with the analytical result clearly enhance the external validity of that result. We conceptually define empirical support as the *extent to which an analytical result has been observed in the market*. We operationally define empirical support as the number of independent empirical studies in which the findings are consistent with the analytical result. The count approach is used because there are inadequate empirical observations to perform a meta-analysis.

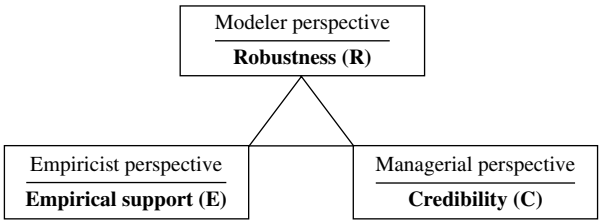
2.1.3. Credibility. Often a question asked of analytical modelers is whether the result is intuitive or credible. This question is addressed through the credibility criterion. We conceptually define credibility as *the extent to which the analytical result is believable*. We operationalize the criterion using a rating scale that reflects the credibility of the theoretical results as perceived by potential end users of the results—store brand marketers and national brand marketers.

2.2. Relevance of Criteria

The three criteria—robustness, empirical support, and credibility—are not new to marketing scientists. In fact, most analytical studies provide some discussion of these criteria. The only difference is that researchers provide intuitive explanations to show that the result is credible (makes sense). We take an additional step by ascertaining credibility (face validity) from managers. In this process, we assess external validity through a triangulation of three relevant perspectives, as represented in Figure 1.

Each perspective has a place in our understanding of the private label phenomenon and in setting a future research agenda. Because the focus is on analytical models, we believe robustness is the prime criterion for external validity. A high robustness score

Figure 1 Measuring External Validity Through Triangulation of Perspectives



gives greater confidence in the applicability of the result to the marketplace; a low robustness score limits the market conditions to which the result applies and highlights the need for further research.

The empirical evidence criterion is the first support criterion. If an analytical result is robust, consistent empirical evidence further enhances the strength of that result. Sometimes, however, due to problems of analytical tractability, mathematical models can incorporate only a limited number of market conditions (low R score). In this case, strong empirical support (high E) suggests that, despite the mathematical result emanating from a stylized model, it is reasonable to believe that the result offers one possible explanation for the observed phenomenon.

Credibility ratings from managers provide face validity to the analytical result. A robust result that is also highly credible suggests that modelers and managers are on the "same page." It should be noted that although the first two measures (R and E) are more objective, the measure of credibility is more subjective and, hence, deemed a secondary support criterion. Nevertheless, agreement or disagreement from managers can help decipher the nature of the gap between analytical results and managerial thinking.

3. Compilation of Results and Assessment of External Validity

In this section, we describe the procedure used for compiling the analytical results and the methodology used for scoring those results on the three criteria.

3.1. Compilation of Analytical Results

We selected published articles that satisfied the following criteria: (i) incorporated the competition between national brand and store brand directly or indirectly, (ii) provided results or insights related to national brand and store brand marketing, (iii) arrived at those results or insights using mathematical analysis and related arguments, and (iv) were published between 1966 and May 2006 (this review was conducted in the summer of 2006). We identified relevant literature through a combination of online searches (e.g., Web of Science) and manual searches. There are 22 published journal articles that satisfy the above four criteria. They are listed in the appendix (Table A.1a).

From the 22 studies, we ascertained or inferred the analytical result(s) or insights produced by the research. For each analytical result, we attempted to identify the underlying exogenous variable (x), the endogenous variable (e), and the conditions under which the result is stated to hold. Where the exogenous or endogenous variables were not clearly identified by the authors, we made our best inference. Those studies with common exogenous and endogenous variables were grouped together. Where comparative statics showed that the results could go either way (+ and −), both results were stated as alternate views. Table 1 lists the 29 analytical results related to retailer strategies and store brand marketing. Table 2 lists the 15 results related to manufacturer strategies and national brand marketing.

We also obtained an explanation for each result as provided by the authors, if available. Where a clear explanation was not provided by the authors, we inferred such explanation from their discussion or used our judgment. The details of the results and their explanations, written in nonmathematical language, are provided in the appendix (Tables A.2 and A.3).

3.2. Scoring the Results on Robustness

Robustness is operationalized as the number of market conditions for which the result has been shown to hold. First, we list the market conditions and then describe the scoring process.

3.2.1. Development of Relevant Market Conditions. Broadly, the marketing of national brands and store brands involves four potential participants (players)—*manufacturers of national brands and manufacturers* (*suppliers*) *of store brands* who sell the products to the *retailers*, who in turn sell it to *consumers*. National brand manufacturers, store brand suppliers, retailers, and consumers represent four structural characteristics in the market (see Table 3). In developing their marketing strategies with respect to national brands and store brands, manufacturers and retailers take into account their cost (cost structure), consumers' demand for their products (demand structure), and the nature of the decision process (decision structure), resulting in a total of seven structural characteristics. Table 3 presents these seven structures and the 28 conditions within them along with brief explanations for their inclusion.

Clearly, these 28 dimensions do not capture all possible real-world conditions that may influence national brand and store brand strategies. For example, manufacturers may sell multiple products to the retailer, there may be a wholesaler between the manufacturer and the retailer, and so forth. However, we believe the list captures the basic market conditions that are important for studying the marketplace competition between national brands and store brands.

Table 1 Analytical Results on Retailer (Store Brand) Strategies and Their REC Scores

Result no.	Exogenous variable (x)	Endogenous variable (e)	Sign	Score R	Score E	Score C
Factors influencing store brand introduction						
R1	Price substitutability between national brands and store brands (also captured through perceived quality differential and size of switching segment)	Retailer profits from store brand introduction	+	**17** (8)	**22** (22, 0, 0)	**8** 7.2 (0.34)
R2	Store brand quality (also measured as base level demand) that generates store brand loyalty or store loyalty	Retailer profits from store brand introduction	+	**15** (7)	**13** (14, 1, 1)	**8** 7.8 (0.44)
R3	Price competition among national brands	Retailer profits from store brand introduction	−	**11** (7)	**1** (1, 0, 0)	**7** 6.9 (0.54)
R4	Number of national brands	Retailer profits from store brand introduction	+	**8** (8)	**1** (2, 1, 0)	**7** 6.7 (0.37)
R4A	Number of national brands	Retailer profits from store brand introduction	−	**7** (7)	**−1** (1, 2, 0)	**3** 3.9 (0.52)
R5	Category dollar sales volume	Retailer profits from store brand introduction	+	**11** (7)	**4** (4, 0, 1)	**8** 8.4 (0.26)
R6	Category dollar margin	Retailer profits from store brand introduction	+	**11** (7)	**2** (2, 0, 1)	**7** 6.7 (0.56)
R7	Manufacturing economies of scale	Store brand Introduction through dual branding	+	**5** (5)	**2** (2, 0, 0)	**7** 6.7 (0.56)
R8	Preference heterogeneity	Store brand Introduction	−	**8** (8)	**0** (0, 0, 0)	**6** 5.9 (0.36)
Factors influencing retailer margin and profits						
R9	Store brand introduction	Retailers' gross profit margin on national brand	+	**10** (7)	**2** (2, 0, 0)	**7** 6.6 (0.50)
R9A	Store brand introduction	Retailers' gross profit margin on national brand	−	**9** (8)	**−2** (0, 2, 0)	**5** 3.3 (0.59)
R10	Store brand introduction	Relative gross profit margin $ margin store brand > $ margin national brand		**10** (8)	**0** (3, 3, 0)	**7** 6.4 (0.56)
R10A	Store brand introduction	Relative gross profit margin % margin store brand > % margin national brand		**10** (8)	**4** (5, 1, 0)	**9** 9.1 (0.18)
R11	Targeting leading national brand with a store brand	Retailer profits	+	**11** (8)	**2** (2, 0, 0)	**8** 7.1 (0.49)
R12	Differentiation between two national brands	Retailer profits from carrying two store brands	+	**7** (7)	**1** (1, 0, 0)	**7** 6.3 (0.53)
R13	Ratio of market share of leading national brand to the number two national brand	Retail profits from carrying two store brands	−	**7** (7)	**1** (1, 0, 0)	**7** 5.7 (0.61)
R14	When two national brands are differentiated across feature and quality	Retail profits—positioning high (low) quality store brand against high (low) quality national brand	+	**7** (7)	**0** (0, 0, 0)	**7** 6.7 (0.49)
R15	When two national brands are undifferentiated in feature dimension	Retail profits from feature differentiation with store brand	+	**7** (7)	**0** (0, 0, 0)	**8** 8.1 (0.44)
Factors influencing store brand share						
R16	Price substitutability between national brands and store brands	Market share of store brands	+	**11** (7)	**10** (10, 0, 0)	**9** 7.9 (0.49)
R17	Store brand quality that generates store brand loyalty or store loyalty	Market share of store brands	+	**11** (9)	**10** (10, 0, 0)	**8** 6.9 (0.65)
R18	Price competition among national brands	Market share of store brands	−	**8** (8)	**1** (1, 0, 0)	**9** 8.0 (0.58)
R19	Number of national brands	Market share of store brands	−	**8** (8)	**5** (5, 0, 0)	**7** 5.9 (0.62)
R20	Price differential between national brands and store brands	Market share of store brands within category	+	**13** (7)	**4** (4, 0, 0)	**7** 7.3 (0.61)
R21	Price differential between national brands and store brands	Market share of store brands across category	−	**9** (7)	**4** (5, 1, 1)	**6** 5.6 (0.57)
R22	Common marginal cost of manufacturing national brand and store brand (e.g., raw material cost for both brands)	Market share of store brands	−	**7** (7)	**0** (0, 0, 0)	**3** 3.8 (0.41)

Table 1 (Cont'd.)

Result no.	Exogenous variable (x)	Endogenous variable (e)	Sign	Score R	Score E	Score C
Factors influencing retail prices						
R23	Introduction of a store brand that is a close substitute of the national brand	Retail price of national brand	−	**13** (8)	**−2** (1, 3, 2)	**5** 4.7 (0.58)
R23A	Introduction of a quality-equivalent store brand in a market segmented on price and advertising sensitivities	Retail price of national brand	+	**7** (7)	**2** (3, 1, 2)	**5** 4.8 (0.71)
R24	Price substitutability between national brands and store brands	Price differential between national brands and store brands	−	**14** (7)	**2** (2, 0, 0)	**9** 7.6 (0.44)
R25	Market concentration among national brand manufacturers	Price differential between national brands and store brands	+	**6** (6)	**1** (1, 0, 0)	**8** 6.7 (0.49)
R26	National brand advertising	Price differential between national brands and store brands	+	**10** (6)	**2** (2, 0, 0)	**8** 8.5 (0.16)
Factors influencing store brand price promotions						
R27	Degree of store brand loyalty	Frequency of price promotions of store brands	−	**8** (8)	**0** (0, 0, 0)	**3** 3.9 (0.54)
R28	Degree of store brand loyalty	Depth of price promotions of store brands	−	**8** (8)	**0** (0, 0, 0)	**8** 7.8 (0.38)
R29	Market consisting only of price shoppers and those who prefer national brands	Store brand price promotions—zero or infrequent		**13** (8)	**−5** (0, 5, 0)	**1** 2.3 (0.38)

Notes. See Table A.2 for more details on the results and for a list of analytical and empirical studies supporting each result. R score: Top number in bold is the measure of robustness (maximum possible score is 28). The bottom number in parentheses is the average number of conditions examined per study across all studies that support the result (see Table 5 for illustration). E score: Top number in bold is the net empirical score (number of studies supporting minus number of studies opposing). There is no maximum for E score. The bottom three numbers in parentheses are number of supporting studies, number of opposing studies, and number of studies showing nonsignificant effect, respectively. E scores for results R1, R2, R16, and R17 include studies that provide indirect empirical evidence (see Table A.2). C score: Top number in bold is the median credibility score (maximum possible score is 10). The two numbers below are mean and standard error.

Table 4 lists the market conditions incorporated in each of the 22 analytical studies.

3.2.2. Scoring Robustness. We illustrate our approach to the quantitative assessment of robustness using the analytical result R1, which states that an increase in price substitutability between national brand and store brand increases a retailer's category profits from store brand introduction. Twelve analytical studies directly or indirectly support the result and they are listed as the top row in Table 5. The market conditions incorporated in these studies are represented as X in Table 5. Ideally, if one study could incorporate all of the conditions and show the result, then we have a perfect robustness score of 28. However, such a scenario is nearly impossible even with numerical analysis. So, we quantify robustness as follows.

We operationalize robustness as the number of market conditions for which the result has been shown to hold. Following this definition, we mark a "yes" for each market condition, if it is represented in at least one of the 12 studies that have shown the result (Table 5, last column). The total number of "yes" marks gives the overall number of market conditions for which the result is valid, i.e., the robustness score. The score for result R1 is 17 out of a maximum possible score of 28.[1] Using the same procedure, the robustness scores for all 44 results are computed and presented (in bold) in Tables 1 and 2 (R column).

3.3. Scoring the Results on Empirical Support

We operationalize empirical support as the number of independent empirical studies in which the findings are consistent with the analytical result. For each analytical result, we searched for publications that provided empirical observations related to the result.[2]

Empirical studies that were included in this review are listed in the appendix (Table A.1b). For each analytical result, the empirical support (E) score was

[1] One concern with this approach is that the score of 17 would be questionable if there were 17 studies, each incorporating, say, just one condition. The greater the number of conditions examined per study, the stronger the case for robustness. To investigate this concern, we computed the average number of conditions captured by the studies that support result R1 (i.e., the average of the numbers in the last row of Table 5). The average is 7.58, or 8 when rounded to the nearest integer. This number is presented in parentheses in the R column of Table 1. The problem of each analytical study examining just one or two market conditions does not exist for result R1 (and for the other results).

[2] However, we did not review articles in the business press because (i) there were too many (several thousand) press articles, and (ii) our initial review did not reveal relevant empirical evidence for the comparative statics results.

Table 2 Analytical Results on Manufacturer (National Brand) Strategies and Their REC Scores

Result no.	Exogenous variable (x)	Endogenous Variable (e)	Sign	Score R	Score E	Score C
National brand (counter) strategies						
M1	National brand manufacturer has cost advantage over competing private label supplier	National brand manufacturer producing store brands for retailer (dual branding)	+	**7** (7)	**1** (1, 0, 0)	**7** 6.6 (0.38)
M2	Quality that differentiates national brand from store brand	Manufacturer profits	+	**14** (7)	**2** (2, 0, 0)	**7** 6.9 (0.56)
M3	National brand quality	National brand advertising	+	**6** (6)	**0** (0, 0, 0)	**7** 7.0 (0.63)
M4	Introduction of a quality store brand when cost of store brand does not increase with its quality	National brand wholesale price	−	15 (8)	2 (3, 1, 1)	5 4.3 (0.40)
M4A	Introduction of a quality store brand when cost of store brand increases with its quality	National brand wholesale price	+	**9** (9)	**−2** (1, 3, 1)	**4** 4.0 (0.34)
M5	Store brand supply cost	National brand wholesale price	+	**8** (8)	**0** (0, 0, 0)	**3** 3.1 (0.32)
M6	Two-part tariff (quantity discounts)	Manufacturer profits	+	**7** (7)	**0** (0, 0, 0)	**7** 6.5 (0.61)
M7	Slotting allowances	Manufacturer profits by discouraging private label entry	0	**7** (7)	**1** (1, 0, 0)	**8** 7.6 (0.40)
National brand price promotions						
M8	Randomly distributed coupons	Manufacturer profits	0	**7** (7)	**0** (0, 0, 0)	**7** 7.1 (0.53)
M9	Coupons targeted at store brand consumers	Manufacturer profits	+	**7** (7)	**2** (2, 0, 0)	**7** 7.1 (0.57)
M10	Dual branding	Price promotions of national brands	−	**7** (7)	**0** (0, 0, 0)	**5** 4.1 (0.28)
M11	Proportion of consumers switching between national brands and store brands	National brand trade deal	+	**8** (8)	**0** (0, 0, 0)	**7** 7.3 (0.36)
M12	Degree of store brand loyalty	Frequency of national brand price promotions	−	**8** (8)	**0** (0, 0, 0)	**6** 6.1 (0.51)
M13	Degree of store brand loyalty	Depth of national brand price promotions	+	**8** (8)	**0** (0, 0, 0)	**6** 6.3 (0.73)
M14	National brand with high loyalty and store brand with low loyalty	Frequency of national brand price promotion < frequency of store brand price promotion		**8** (8)	**−1** (2, 3, 0)	**5** 5.7 (0.64)
M15	National brand with high loyalty and store brand with low loyalty	Depth of national brand discount > depth of store brand discount		**11** (9)	**2** (2, 0, 0)	**8** 7.4 (0.35)

Notes. See Table A.3 for more details on the results and for a list of analytical and empirical studies supporting each result. For R score, E score, C score, see the notes in Table 1 for details.

computed as the number of empirical studies that support the result minus the number of empirical studies that contradict (oppose) the result. Tables 1 and 2 present the E scores for the retailer results and the manufacturer results, respectively. Tables A.2 and A.3 in the appendix provide a listing of the relevant analytical and empirical studies for retailer results and manufacturer results, respectively.

3.4. Scoring the Results on Credibility

We operationalize this criterion using a rating scale that reflects the credibility as perceived by store brand and national brand marketers (potential end users of the results). Credibility of each result was measured using a single 10-point rating scale. We first stated the result and its explanation (as given in Tables A.2 and A.3). Then, we asked the following

Based on the explanations provided or otherwise, please rate the credibility of the result, i.e., the likelihood that the result holds in grocery product markets (1 = *not at all credible;* 10 = *very credible*).

Not at all credible 1 2 3 4 5 6 7 8 9 10 Very credible

Finally, we asked for comments (open-ended responses) on each result. (Only a few managers provided comments.)

The 29 analytical results related to the retailer (R1–R29) were divided into two sets of 15 and 14 questions to reduce the respondent burden. Thus, we used

Table 3 Market Conditions Considered in the Computation of Robustness Score

Market conditions	Description
I. National brand (NB) manufacturer structure 1. One manufacturer 2. Two symmetric manufacturers 3. Two asymmetric manufacturers 4. Multiple (>2) symmetric manufacturers 5. Multiple asymmetric manufacturers	Many studies (e.g., Mills 1995, 1999) assume one manufacturer for analytical tractability. Some studies (e.g., Raju et al. 1995b) incorporate competition among national brands by assuming the presence of two or more manufacturers. These manufacturers may be identical or symmetric, or the manufacturer's national brands may be nonsymmetric. Thus, we have five dimensions describing national brand manufacturer structure.
II. Retailer structure 6. One retailer 7. Two symmetric retailers 8. Two asymmetric retailers 9. Multiple (>2) symmetric retailers 10. Multiple asymmetric retailers	Almost all studies listed in Table A.1a either did not incorporate the retailer or included only one retailer. Only Corstjens and Lal (2000) considered two symmetric retailers. Nevertheless, there are five possible retailer structures along the same lines as for the national brand manufacturers.
III. Store brand (SB) supplier structure 11. Independent strategic player 12. NB manufacturer	Store brand supplier is assumed not to be a strategic player in most analytical models—the retailer simply obtains the product from the competitive open market at cost. If the store brand supplier is included as a potential player, then it can be an independent strategic manufacturer or one of the national brand manufacturers.
IV. Consumer structure—Segments considered 13. NB loyal: rpd $\ggg 0$ 14. NB preferrer: $0 <$ rpd $< U$ 15. Price shopper: rpd $= 0$ 16. SB preferrer: $-U <$ rpd < 0 17. SB loyal: rpd $\lll 0$	Some studies analyze aggregate demand models without explicit consideration of different consumer segments. Other studies capture consumer demand through characterization of consumer segments. These segments mainly differ in their reservation price differential (rpd), defined as the price premium that consumers are willing to pay for national brand over store brand. Five types of consumer segments are envisaged. National (store) brand loyals will always purchase the national (store) brand. National (store) brand preferrers will pay a positive premium (up to U, where U is a large number) for national (store) brands. Price shoppers will simply purchase the lower-priced brand.
V. Cost Structure (NB versus SB) 19. Constant equal marginal cost 20. Constant unequal marginal cost 21. Variable equal marginal cost 22. Variable unequal marginal cost	There are fixed and variable costs of manufacturing the national brand and the store brand. By and large, the fixed (sunk) costs do not influence the marketing of national and store brands. The marginal costs of national brand and store brand can be either constant or variable (change with quality of product or quantity sold). In addition, the marginal cost of national brand can either be the same as the cost of store brand or different.
VI. Demand structure 23. Linear in price 24. Nonlinear in price 25. Category demand fixed 26. Category demand variable	Most mathematical models, for analytical tractability, assume that the demand functions for the national brand and the store brand are linear in prices. Some assume that total category demand is fixed. However, brand demand can be nonlinear, and category demand may change with prices and introduction of store brand.
VII. Decision structure 27. Stackelberg leader-follower 28. Nash simultaneous moves	A common assumption, in keeping with the sequence of observed moves, is that the national brand manufacturers are Stackelberg leaders. That is, the manufacturers set their wholesale prices first and then the retailers set the retail prices. An alternate possibility is that there is no leader-follower structure and that they both simultaneously make decisions—often called the Nash structure.

three questionnaires—two for retailers and one for national brand managers. The surveys were pretested, refined, and administered online through SurveyMonkey (http://www.surveymonkey.com). The survey instruments are available on request from the authors.

Our desired respondents were those involved in store brand marketing and merchandising (for the retailer results) and national brand marketing (for the manufacturer results). Links to the surveys were e-mailed to a sample of 350 retail executives, national brand managers, and grocery consultants based on lists obtained from *Chain Store Guide*, *The List, Inc.*, and informal contacts. Completed responses were received from 65 executives. The two retailer questionnaires were each completed by 21 executives, while the manufacturer questionnaire was completed by 23 national brand managers. Tables 1 and 2 present the median and mean C scores for the retailer results and the manufacturer results, respectively. We now discuss the results.

4. Discussion of Key Results—Retailer Strategies

We first classify the results based on their REC scores. The mean REC scores across all observations are 9.3 (R), 2.1 (E), and 6.5 (C).[3] Accordingly, we used the

[3] The correlations are 0.47 (R and E), 0.44 (E and C), and 0.04 (R and C). If there are sufficient number of studies or data points for evaluating R, E, and C, we would expect the correlations to be positive and fairly high. In our review, some results are evaluated based on just one or two studies, so it is difficult to interpret the correlations.

Table 4 Market Conditions Represented in the Analytical Studies Listed in Table A.1a

	Study number																					
Market conditions	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22
I. National brand manufacturer structure																						
1. One manufacturer	X	X				X		X	X	X	X	X	X			X				X	X	
2. Two symmetric manufacturers			X	X			X							X	X		X	X	X	X		X
3. Two asymmetric manufacturers			X											X			X	X		X		
4. Multiple (>2) symmetric manufacturers				X										X	X				X			
5. Multiple asymmetric manufacturers																						
II. Retailer structure																						
6. One retailer		X	X			X	X	X	X		X			X	X		X	X		X		X
7. Two symmetric retailers					X																	
8. Two asymmetric retailers																						
9. Multiple (>2) symmetric retailers																						
10. Multiple asymmetric retailers																						
III. Store brand supplier structure																						
11. Independent strategic player	X									X			X			X						
12. National brand manufacturer																					X	X
IV. Consumer structure (segments)																						
13. National brand loyal					X		X			X	X		X									
14. National brand preferrer	X	X			X		X	X	X	X	X		X			X				X	X	
15. Price shopper		X								X						X					X	
16. Store brand preferrer										X			X									
17. Store brand loyal										X			X									
V. Cost structure (NB versus SB)																						
19. Constant equal marginal cost				X	X		X	X	X	X			X	X	X	X	X	X		X	X	
20. Constant unequal marginal cost	X		X		X	X					X					X	X					
21. Variable equal marginal cost		X																				
22. Variable unequal marginal cost		X										X							X			X
VI. Demand structure																						
23. Linear in price		X	X	X		X	X	X	X	X	X	X		X	X		X	X	X	X	X	X
24. Nonlinear in price	X			X	X	X				X		X	X			X			X			
25. Category demand fixed	X				X					X	X					X			X	X		
26. Category demand variable		X	X	X		X	X	X	X			X		X	X		X	X	X		X	X
VII. Decision structure																						
27. Stackelberg leader-follower		X	X				X	X	X		X			X	X		X	X		X		X
28. Nash simultaneous moves																						

following cutoffs to classify a result as high or low on the three criteria: 10 (for R), 3 (for E), and 7 (for C). This procedure yields eight groups of results, as presented in Table 6.

Below, we discuss the five groups (1, 3, 4, 7, 8) from Table 6, in which there are at least two retailer results. For each group, we discuss the key results and propose future research directions.

4.1. Established Generalizations—High R, High E, and High C

Results in this group have the highest external validity based on robustness, empirical support, and credibility.

4.1.1. Discussion of Key Results. Many studies show a positive relationship between national brand versus store brand price substitutability and incremental profits from store brand introduction (R1) using multiple indicators of the price substitutability construct: (i) cross-price sensitivity parameter (e.g., Raju et al. 1995b); (ii) size of switching segment (e.g., Narasimhan and Wilcox 1998); (iii) store brand utility as a fraction of national brand utility (Mills 1995); and (iv) cost of exercising a call option on the national brand (Horowitz 2000). Multiple operationalizations strengthen the robustness of the result.

There are two explanations for this result. One rationale, offered by Raju et al. (1995b) and related studies, points to the high margins obtained from store brands. In their model, in equilibrium, the retail margin on the store brand is greater than the corresponding margin on the national brand. High price substitutability increases the quantity of private labels sold. Therefore, switching consumers to higher margin private labels increases total retailer profits.

Table 5 Computation of Robustness Score—Illustration for Result R1

	Studies supporting result R1 (no.)												
Market conditions	A2	A3	A6	A7	A8	A9	A11	A14	A15	A17	A18	A20	Condition included?
National brand manufacturer structure													
1. One manufacturer	X		X		X	X	X					X	Yes
2. Two symmetric manufacturers		X		X				X	X	X	X	X	Yes
3. Two asymmetric manufacturers		X						X		X	X	X	Yes
4. Multiple (>2) symmetric								X	X				Yes
5. Multiple asymmetric													
Retailer structure													
6. One retailer	X	X	X	X	X	X	X	X	X	X	X	X	Yes
7. Two symmetric retailers													
8. Two asymmetric retailers													
9. Multiple (>2) symmetric retailers													
10. Multiple asymmetric retailers													
Store brand structure													
11. Independent strategic player													
12. National brand manufacturer													
Consumer structure—segments													
13. National brand loyal				X			X						Yes
14. National brand preferrer	X			X	X	X	X					X	Yes
15. Price shopper	X												Yes
16. Store brand preferrer													
17. Store brand loyal													
Cost structure (NB versus SB)													
19. Constant equal marginal cost				X	X	X		X	X	X	X	X	Yes
20. Constant unequal marginal cost		X	X				X			X			Yes
21. Variable equal marginal cost	X												Yes
22. Variable unequal marginal cost	X												Yes
Demand structure													
23. Linear in price	X	X	X	X	X	X	X	X	X	X	X	X	Yes
24. Nonlinear in price			X										Yes
25. Category demand fixed							X					X	Yes
26. Category demand variable	X	X	X	X	X	X		X	X	X	X		Yes
Decision structure													
27. Stackelberg leader-follower	X	X		X	X	X	X	X	X	X	X	X	Yes
28. Nash simultaneous moves													
No. of market conditions included (= no. of X marks)	**9**	**7**	**6**	**8**	**7**	**7**	**8**	**8**	**7**	**8**	**7**	**9**	

Notes. Refer to Table A.1a for study references corresponding to the study numbers. Robustness measure: R = number of conditions incorporated in at least one study = number of "yes" = 17. Average measure: average number of market conditions incorporated per study = average of numbers in the last row = 91/12 = 7.58, or 8 (rounded to nearest integer).

A second explanation, forwarded by Mills (1995) and Scott-Morton and Zettelmeyer (2004), states that high price substitutability makes national brands less indispensable, i.e., reduces the incremental contribution of national brands to channel profits, thus eroding manufacturers' bargaining power. Hence, retailers can extract higher profits and a higher share of channel profit if there is a store brand that resembles the national brand. Multiple explanations suggest different paths leading from the exogenous variable (x) to the endogenous variable (e), thus enhancing the robustness of the result.

Empirical support for this result is predominantly indirect and includes studies that showed a positive relationship between price sensitivity, quality sensitivity, perceived quality (all potential surrogates of price substitutability), and store brand share, store brand proneness, and store brand margins and profits (all potential store brand success factors). See Sethuraman (2006, Table 1) for a compilation. Managers also assigned high credibility to the result. This result (R1) validates the common belief that private labels proliferate in categories with little differentiation between national brands and store brands (Stern 1966).

Table 6 Grouping of Results Based on REC Scores

	High robustness ($R \geq 10$)	Low robustness ($R < 10$)
High empirical support ($E \geq 3$)		
High credibility ($C \geq 7$)	1. Established generalizations R1, R2, R5, R10A, R16, R17, R20	5. Potential generalizations lacking analytical validation R19
Low credibility ($C < 7$)	2. Questioning managerial belief M4	6. Empirically strong results R21
Low empirical support ($E < 3$)		
High credibility ($C \geq 7$)	3. Potential generalizations lacking empirical validation R3, R6, R9, R10, R11, R24, R26 M2, M15	7. Conventional wisdom R4, R7, R12, R13, R14, R15, R18, R25, R28 M1, M3, M6, M7, M8, M9, M11
Low credibility ($C < 7$)	4. Theoretical results lacking practice substantiation R23, R29	8. Unsupported results R4A, R8, R9A, R22, R23A, R27 M4A, M5, M10, M12, M13, M14

Result R2 considers the role of quality beyond its ability to influence price substitutability. Raju et al. (1995b) and related studies capture this role through an intercept term in the store brand demand function, representing store brand strength. Corstjens and Lal (2000) operationalize the quality of a store brand in terms of the fraction of consumers who try the store brand and find it "acceptable." They show that under certain broad parametric conditions, total retailer profits are increasing in store brand quality even if the store brand does not have a cost or margin advantage. The basic intuition behind the results of Corstjens and Lal (2000) is that a high-quality store brand differentiates stores from each other and increases store loyalty. Hence, even when a high-quality store brand is not profitable, the optimal strategy might be to introduce the high-quality brand because ancillary benefits derived through the purchase of goods elsewhere in the store by the loyal consumer may be greater. Indirect empirical evidence (along the same lines as for result R1) and managerial feedback also support this result.

A third key generalization relates to retailer margins (R10/R10A). Conventional wisdom suggests that retailers would get higher profit margins on the store brands because they often obtain the store brand directly from the producer and do not incur significant marketing costs. Empirical researchers have made the distinction between absolute dollar margin (price − cost) and percent profit margin or margin as a percentage of price [(price − cost) ∗ 100/price]. There is high external validity for the result R10A, namely, a retailer's *percent* profit margin for store brands is greater than that for national brands; however, empirical evidence for the result R10 regarding *absolute* dollar margin is mixed and the result received a lower credibility score from managers. That is, the retailer's dollar profit margin on the store brand may be higher or lower than the retailer's dollar profit margin on the national brand.

4.1.2. Future Research Directions. Despite high scores on all three dimensions, there are some caveats that limit the generalizability of result R1. The first limitation is the cost factor. The implicit assumption in most analytical models is that the cost of supplying a private label that is a close substitute of the national brand will not exceed the cost of the national brand. However, as Bontems et al. (1999) show and Sayman et al. (2002) point out, if the cost of providing a substitutable store brand is high, retailer profits from a store brand introduction may not increase.

The second limitation is the presence of retail competition. The grocery products retail marketplace is becoming very competitive, especially following the entry of Wal-Mart. However, no published analytical study has addressed the relationship between store brand introduction and retail competition.

A third limiting condition relates to national brand innovation and marketing and its role in category expansion. Result R1 probably holds for many products in the mature stage of the life cycle (category demand is fixed and the market is price driven), but it may not hold for products in the early stage of the life cycle. The reason is that when a highly substitutable store brand is introduced at lower prices, the national brand manufacturer is forced to compete on the basis of price. This predicament could reduce the manufacturer's incentive to invest in category expansion activities such as advertising and product innovation, a situation that may be unprofitable to both the manufacturer and the retailer. Analytical models could capture the distinction between mature products and products in the early stage of the life cycle, including the impact of national brand advertising.

A fourth limitation relates to asymmetry in cross-price effects. Most analytical models that derive result R1 assume symmetry, i.e., the effect of national brand price change on store brand sales is the same as the effect of store brand price change on national brand sales. The asymmetric price-tier effect theory proposed by Blattberg and Wisniewski (1989) suggests that the former effect is greater than the latter effect. How would the analytical result change if there

were asymmetries in the cross-price effect? This is an interesting question for future research.

A logical extension to the consideration of store brand quality and retail competition is the issue of premium store brands. The distinction between premium private labels (e.g., Loblaw's *President's Choice* and Marks and Spencer's *St. Marks*) and traditional store brands (e.g., Kroger's *Big K* cola brand) is the vision of retailers to differentiate their premium brands from the national brands on quality as well as to increase store differentiation. According to Kumar and Steenkamp (2007), premium store brands are one of the hottest trends in retailing. Yet, there has been no significant modeling work or empirical work that attempts to analyze the conditions conducive for premium private labels.

With respect to the result on retail margin, we find that the percent profit margins (margin as a percentage of price) on store brands is generally greater than the margin for national brands; however, the absolute dollar profit margin that the retailer obtains from selling one unit of the store brand may be higher or lower than the profit margin obtained from selling one unit of the national brand. Because a retailer's profit equals absolute dollar margin per unit times unit sales, the focus of the researchers and the managers should be on absolute dollar margin. Future theoretical and empirical research can identify the market conditions in which the absolute margins are higher for the store brand than for the national brand, and identify the conditions in which they are lower.

4.2. Potential Generalization Lacking Empirical Validation—High R, High C, but Low E

Results belonging to this group are those in which the empirical support score was less than two, but which are otherwise high on external validity.

4.2.1. Discussion of Key Results. Result R3 states that a high level of price competition among national brands decreases retailers' profits from store brand introduction. When price competition among national brands is high, the average national brand retail price decreases. The lower national brand price in turn depresses the price and retail margins for the store brand, resulting in lower category profits. For example, if Coke and Pepsi compete with each other aggressively on price, there may be little room for a store brand to enter the market and be profitable.

We believe result R3 is not so obvious and has important implications for retailers because it draws attention to both the price competition between national brand and store brand *and* the price competition among national brands. The two types of price competition have opposing effects on profitability from store brand introduction.

The effect of store brand introduction on national brand wholesale price, retail price, and retail margin are interrelated and, hence, are discussed together. The conventional economic view holds that a store brand introduction increases price competition for the incumbent national brand. The increased price competition depresses both the wholesale price and the retail price of the national brand, as shown in Raju et al. (1995b) and many other studies. It also predicts that retailers' gross margin on national brand also decreases with store brand introduction.

On the other hand, the bargaining model of Scott-Morton and Zettelmeyer (2004) implies that retailers will be able to extract lower prices from the manufacturer by introducing (or threatening to introduce) a store brand of similar quality. In this scenario, the national brand wholesale price goes down but the retailer's price and margins on the national brand may go up.

Kim and Parker (1999) and Soberman and Parker (2004) offer a price discrimination view of store brands. They theorize that as national brand manufacturers increase advertising, retailers increase the price of both national brands and private labels because advertising allows retailers to better price discriminate across two segments (national brand seekers versus product seekers at whom the private labels can be targeted). Bontems et al. (1999) make a cost-based argument that suggests that if obtaining a high-quality private label is costly for the retailer, the national brand manufacturer need not accommodate store brand entry by lowering its wholesale price.

Which direction has greater external validity in our review? First, let us consider the question of whether national brand wholesale price increases or decreases with a store brand introduction. Comparing M4 and M4A (Table 2), we find that there is greater external validity support for the notion that national brand wholesale price *decreases* with store brand presence (M4). Comparing R23 and R23A (Table 1), we find that there is no clear winner. Retail prices of national brands may decrease or increase with a store brand introduction. Comparing R9 and R9A (Table 1), we find that there is greater external validity support for the notion that national brand retail margin *increases* with store brand presence (R9).

4.2.2. Future Research Directions. Perusal of the results in this group (Table 1) indicates that an E score of less than two was simply because of the paucity of empirical studies pertaining to those results. Therefore, a recommendation for future research is to conduct more empirical work.

In particular, analytical models provide multiple (price competition, bargaining, price discrimination, and cost) perspectives on the movement of national brand prices and margins in response to a store brand

introduction. One perspective may dominate the others depending on the market conditions. For example, the price competition perspective may dominate in mature or commodity products while the price discrimination argument may apply in advertising sensitive (hedonistic) product categories. Researchers can develop hypotheses linking market conditions to national brand price movement and test them empirically.

In addition, retailers said the directional movement of the national brand price will depend on the size and negotiating power of the retailer, strength of the national brand, store brand positioning, retailer objectives, and retail competition. These factors should be better understood and perhaps incorporated in future analytical models.

4.3. Theoretical Results Lacking Practice Substantiation—High R, Low E, Low C

Results in this group imply that despite fairly strong robustness, the empirical support and credibility scores are low.[4]

4.3.1. Discussion of a Key Result. A key result that falls into this category relates to price promotions. Price promotions are temporary discounts from regular prices. Two articles (Lal 1990, Rao 1991) state that the weak store brand, promotes infrequently or does not engage in price discounting at all. Their general reasoning is that the incentives for brands to price promote stem from having to charge a regular price to cater to its loyal customer base and occasionally make forays into the switcher segment through price cuts. Because store brands are primarily viewed as brands with little loyalty and catering mainly to the price sensitive (switcher) segment, this incentive does not arise. Therefore, store brands do not promote unless its switcher base is significantly threatened. Though not explicitly stated as a proposition, Narasimhan (1988, p. 441) also offers a similar recommendation—in categories where there are many brands with intense rivalry, the (store) brand that has the least amount of pulling power may want to keep a permanent low price and not discount at all.

However, this result was not validated on criteria E and C. Retailers disagreed with the theoretical premise that store brands should promote infrequently (R27 and R29). This disagreement is also reflected in empirical work, which shows that private labels do engage in high levels of price promotions in grocery products. Ailawadi et al. (2006) explain (from CVS pharmacy data) that store brands have higher margins even after discounting, so promoting store brands is often profitable for the retailer.

Result R29 is a strong result that states that a store brand should *not* be price promoted. A counter-result (M14) by Raju et al. (1990) and supported under certain conditions by Narasimhan (1988) shows that the strong national brand promotes less often than the (weak) store brand. This result received mixed support with a credibility rating of five.

4.3.2. Future Research Directions. The above discussion reveals that while store brands are promoted fairly frequently, it is not clear whether they are promoted more often than national brands. The reasons for promoting private labels, as stated by managers, include (i) the need to protect store brand turf, (ii) the need to generate trial and repeat of store brand, (iii) the desire to simply promote what customers want, and (iv) the potential for higher margins. Future research could incorporate some of these factors and illuminate the reasons for store brand price promotion through more theoretical and empirical investigation.

4.4. Conventional Wisdom—Low R, Low E, but High C

Results in this group have low R scores primarily because very few analytical studies have investigated the comparative statics results. These results have low E scores because few empirical studies have tested them. However, because they score high on managerial credibility, we refer to the results as conventional wisdom.

4.4.1. Discussion of Key Results. Common belief would indicate that there is no place for a store brand when there is already a large number of national brands. Accordingly, Schmalensee (1978) argues that preemptive product differentiation and proliferation by incumbents in a market can deter a store brand entrant. Contrary to this common belief, Raju et al. (1995b) show analytically that retailers would find it more profitable to introduce a store brand in categories with a large number of national brands. They reason that it is easy to "sneak in" a store brand without affecting the profits of the existing brands when the number of existing national brands is large. Although they do not explicitly model the number of national brands, Scott-Morton and Zettelmeyer (2004) argue that more manufacturers actively producing national brands indicates fewer barriers to entry; hence, the retailer can easily find a supplier for its store brand.

Our assessment of external validity suggests that result R4 dominates result R4A. That is, categories

[4] An analytical result with low external validity scores does not mean that the theoretical result is inherently wrong or invalid. In fact, an analytical result cannot be wrong unless the mathematics behind the derivation are wrong. A low E/C score means that the stated result is not generally observed in the market. It may be that conditions imposed in the analytical model are different from the conditions observed in the market, or perhaps decision makers' behavior in the real world is different from the behavior assumed in the theoretical model.

with a large number of national brands may actually be conducive for store brand introduction. In addition to the explanations provided above, a supporting argument offered by the managers is that when there are many national brands, each one on average tends not to be very strong and, therefore, provides an opportunity for store brands to enter.

When selecting a store brand supplier, the retailer has three options: (i) procure from an independent (fringe) manufacturer, (ii) obtain from a national brand manufacturer (dual branding), or (iii) produce its own store brands. Broadly, there are two considerations for both the retailer and the manufacturer to participate in dual branding—cost consideration and strategic consideration.

Cost consideration is advanced by Peles (1972) and Mills (1999)—results M1 and R7. If, and only if, the national brand manufacturer has a cost advantage of supplying a private label over other competitive suppliers, then in equilibrium the manufacturer will offer to produce the private label, and the retailer will accept the offer so long as there are no externalities such as increased bargaining power. The intuition is that if there is cost advantage, the manufacturer can foreclose supplies from an independent manufacturer, and the brand manufacturer makes more profit than it would selling just its own premium brand. Cost advantage can arise through economies of scale or excess capacity (Peles 1972, Quelch and Harding 1996).

Price discrimination is one strategic consideration for dual branding. Soberman and Parker (2004) argue that if consumers are clearly segmented as product seekers (who buy only based on price and are not advertising sensitive) and brand seekers (who prefer national brands and are advertising sensitive) and if the manufacturer can determine the wholesale price of both the national brand and the private label, then the manufacturer should always be willing to supply private labels. In their model, the private label is a gift from the retailer to the manufacturer because it allows manufacturers to discriminate between brand seekers and product seekers (Soberman and Parker 2004). Price discrimination as a motive for dual branding has been a subject of many Federal Trade Commission enquiries even from the 1960s (Stern 1966).

Other considerations for engaging in dual branding from a retailer perspective are: (i) quality assurance and (ii) increased cooperation from the national brand manufacturer, especially in a market where there are many store switchers. Considerations from the manufacturer perspective include (i) increased bargaining power with the retailer and (ii) possible cooperative arrangements with the retailer (Quelch and Harding 1996, Dunne and Narasimhan 1999).

4.4.2. Future Research Directions. Dual branding is fairly common in the grocery products market. However, there is scant literature on both the analytical and empirical fronts. Given the richness of the phenomenon and the high level of managerial interest, there is a need to advance our understanding of dual branding through further analytical and empirical work.

4.5. Unsupported Results—Low R, E, and C Scores

Results in this group have low external validity along all three dimensions.

4.5.1. Discussion of a Key Result. Many results in this group have been discussed earlier. The one result that we believe needs greater understanding relates to preference heterogeneity.

Suppose there are two markets, both having the same average relative preference (reservation price differential) for national brands over store brands. In one market, the distribution of preference is homogeneous around the mean—all households have the same relative preference. In the other market, the distribution of preference is heterogeneous. In which market should a store brand be introduced? Narasimhan and Wilcox (1998) have shown that the likelihood of store brand introduction decreases with an increase in heterogeneity. The reason is that by introducing a store brand in a homogeneous market, the retailer can avail its ability to significantly alter market shares through small changes in price differential and gain profits.

4.5.2. Future Research Directions. Heterogeneity among consumers is an important consideration for modelers and practitioners alike. There is a clear need for understanding the effect of consumer heterogeneity on the marketing of national brands and store brands.

5. Discussion of Results—Manufacturer Strategies

Because of the scarcity of analytical work and manufacturer data, most manufacturer results have low R and E scores and fall in the conventional wisdom and unsupported results groups, depending on whether the results were considered more credible ($C \geq 7$) or less credible ($C < 7$) by managers.

5.1. Conventional Wisdom—Low R, Low E, but High C

5.1.1. Discussion of Key Results. Because of their interrelated nature, some key manufacturer results have already been discussed in §4 along with retailer strategies. Among other results, advertising high-quality national brands (M3) and offering a two-part tariff (quantity discount) to retailers to sell more

national brands (M6) were two national brand counterstrategies that received a good credibility rating (7 of 10). One national brand manager commented that offering quantity discounts was a "great idea and [I] hope the retailers can be convinced of the same!" The strongest managerial support was for result M7, which states that slotting allowances are *not* a viable strategy for deterring private label entry. In addition, coupons targeted at private label buyers accompanied by an increase in the regular price of national brands could increase the profits for both manufacturers and retailers. Another result with high credibility is that the national brands are discounted more deeply than the store brands (M15).

5.1.2. Future Research Directions. Many analytical results related to national brand counterstrategies were obtained from just one article (Mills 1999). This article studies only a two-firm vertical market structure (one manufacturer and one retailer). Clearly, there is a need to include more market conditions in the analytical models. Recognizing that retailers set (control) the prices of both national brands and store brands, Mills (1999) identifies counterstrategies that are profitable to both manufacturers and retailers. This approach could be extended to explore the scope for retailers and manufacturers cooperating through the sale of national brands and store brands for mutual benefit.

5.2. Unsupported Results—Low R, Low E, and Low C

5.2.1. Discussion of Key Results. These results do not pass muster when tested for external validity. However, some results offer insights. Wu and Wang (2005) provide an interesting model that suggests that if the leading national brand offers the store brand (dual branding), then the retailer may demand less of a trade deal from the national brand manufacturers. Many national brand managers believed that store brand quality or cost would not significantly influence their wholesale prices because they are more focused on the prices of other national brands than on the store brands.

5.2.2. Future Research Directions. As stated in §4.4.2, research that identifies the antecedent and consequent factors of manufacturer dual branding is an important topic for future research. Furthermore, as retailers start to build a loyal segment through their premium private labels, it is important to understand the implications of premium store brands for national brand manufacturers.

6. Conclusion

In this paper, we have reviewed the literature on mathematical models of national brand and store brand competition. Specifically, we compiled 44 analytical results related to national brand and store brand marketing based on a review of 22 studies published between 1966 and 2006. These results are presented in the form of comparative statics in Table 1 for retailer strategies and in Table 2 for manufacturer strategies. We then assessed the external validity of the 44 results using three criteria—robustness, empirical support, and credibility. We provide a quantitative assessment of external validity by scoring the results on these three criteria and obtaining an REC score of external validity. The REC scores for the 44 analytical results are presented in Tables 1 and 2. Key retailer and manufacturer results are discussed in §4 and §5, respectively. Important results and insights from this discussion are summarized below.

6.1. Summary of Key Results and Insights

1. An increase in price substitutability between national brand and store brand increases retailers' profits from a store brand introduction.

2. An increase in store brand quality (leading to store brand loyalty or store loyalty) can increase the retailers' profits from a store brand introduction.

3. Higher levels of price competition between national brands and store brands *increase* retailers' profits from store brand introduction while higher levels of price competition among national brands *decrease* retailers' profits from store brand introduction.

4. Overall, national brand wholesale prices *decrease* with store brand introduction; however, retailers' margins on national brands *increase* with store brand presence.

5. Retailers' gross profit percent margins on store brands are generally higher than gross profit percent margins on national brands. However, retailers' absolute dollar margins on store brands may be higher or lower than those for the national brands.

6. Conventional wisdom that states that new brands should not enter an already crowded market does not seem to apply to the introduction of private labels. Research findings favor the introduction of a store brand when there are *many* national brands in the category.

7. The theoretical premise that store brands should price promote infrequently was met with broad disagreement from retail executives. The reasons for promoting private labels include (i) higher margins, (ii) the need to protect store brand turf, (iii) the need to generate trial and repeat of a store brand, and (iv) the desire to simply promote what customers want.

8. National brand differentiation, advertising, and quantity discounts may be effective counterstrategies to combat private label penetration, but slotting allowances would not be a viable strategy to prevent private label entry.

9. National brand coupons specifically targeted at private label consumers accompanied by regular price increases may be a profitable strategy for both manufacturers and retailers.

10. There is high external validity for the result that national brands offer larger dollar discounts than store brands; however, the evidence on the relative frequency of price promotions of national brands and store brands is mixed.

6.2. Future Research Agenda

Based on our review (§§4 and 5), we believe the following research topics are important and germane for future analytical and empirical research:

1. Effect of retail competition on national brand and store brand marketing.
2. Store brand strategies in different stages of the product life cycle.
3. Dynamics of store brand competition with leading and secondary national brands.
4. Cost and strategic considerations for dual branding.
5. Conditions conducive for premium private labels.
6. Market characteristics that influence store brand prices and margins relative to national brands.
7. Reasons for private label price promotion.
8. Manufacturer strategies—especially those benefiting both manufacturers and retailers.

Finally, our review pertains only to grocery products, because there is little or no research on nongrocery products such as appliances and apparel. Private labels are a major force in these markets as well. Would the results for nongrocery products be different from the ones specified above? Future research could study market structures in nongrocery settings.

6.3. Limitations

The method used in compiling and scoring the results has several limitations. When compiling the results, where the authors did not clearly state the analytical results or the intuition, we used our best judgment. We may have missed some results or modified the intuition to some extent. We may also have inadvertently omitted some studies pertinent for this review.

We operationalized robustness based on market conditions that were generally deemed pertinent (Table 3). We did not include certain market conditions such as the presence of a wholesaler, nor could we include specific parametric conditions for which the analytical results were shown to hold. More conditions can be incorporated.

Because of the difficulty of obtaining data on the parameters considered in the analytical results, many empirical studies provided only indirect evidence. Hence, there was some subjectivity (we tended to be more inclusive) in mapping the empirical studies to the particular analytical result. Furthermore, because of the paucity of empirical studies and lack of adequate study-related information, we could not use formal meta-analytic approaches for integrating the empirical results. We computed the empirical support score using an unweighted count approach (net number of studies supporting the result).

Finally, our credibility scores come directly from managers (potential end users). Thus, this project serves as a bridge between scholars and practitioners. However, the relatively low response rate limits the ability to generalize across a wide spectrum of managers. Future research can address some of these concerns and update researchers and managers on the progress made in the analysis of national brand and store brand competition.

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Appendix

Table A.1a List of Published Analytical Studies Reviewed

No.	Study	No.	Study	No.	Study
A1	Abe (1995)	A8	Mills (1995)	A15	Raju et al. (1995a)
A2	Bontems et al. (1999)	A9	Mills (1999)	A16	Rao (1991)
A3	Choi and Coughlan (2006)	A10	Narsimhan (1988)	A17	Sayman et al. (2002)
A4	Connor and Peterson (1992)	A11	Narasimhan and Wilcox (1998)	A18	Sayman and Raju (2004)
A5	Corstjens and Lal (2000)	A12	Peles (1972)	A19	Schmalensee (1978)
A6	Horowitz (2000)	A13	Raju et al. (1990)	A20	Scott-Morton and Zettelmeyer (2004)
A7	Lal (1990)	A14	Raju et al. (1995b)	A21	Soberman and Parker (2004)
				A22	Wu and Wang (2005)

Table A.1b List of Relevant Empirical Studies Reviewed

No.	Study	No.	Study	No.	Study
E1	Ailawadi and Harlam (2004)	E21	Dhar and Hoch (1997)	E41	Rao (1969)
E2	Ailawadi et al. (2006)	E22	Elzinga and Mills (1996)	E42	Richardson et al. (1994)
E3	Ailawadi et al. (2001)	E23	Elzinga and Mills (1999)	E43	Richardson et al. (1996)
E4	Applebaum et al. (2003)	E24	Erdem et al. (2004)	E44	Sayman et al. (2002)
E5	Ashley (1998)	E25	Fitzell (1992)	E45	Sayman and Raju (2004)
E6	Barsky et al. (2001)	E26	Halstead and Ward (1995)	E46	Schmalensee (1978)
E7	Batra and Sinha (2000)	E27	Hoch (1996)	E47	Scott-Morton and Zettelmeyer (2004)
E8	Bellizzi et al. (1981)	E28	Hoch and Banerji (1993)	E48	Sethuraman (1992)
E9	Blattberg and Wisniewski (1989)	E29	Kim and Parker (1999)	E49	Sethuraman (1995)
E10	Bonfrer and Chintagunta (2004)	E30	Kumar and Steenkamp (2007)	E50	Sethuraman (2003)
E11	Bronnenberg and Wathieu (1996)	E31	McMaster (1987)	E51	Sethuraman and Mittelstaedt (1992)
E12	Burger and Schott (1972)	E32	Myers (1967)	E52	Sethuraman and Cole (1999)
E13	Burton et al. (1998)	E33	Narasimhan and Wilcox (1998)	E53	Steenkamp and Dekimpe (1997)
E14	Chintagunta et al. (2002)	E34	Pancras and Sudhir (2007)	E54	Steiner (1993)
E15	Connor and Peterson (1992)	E35	Pauwels and Srinivasan (2004)	E55	Steiner (2004)
E16	Cook and Schutte (1967)	E36	Putsis (1997)	E56	Sudhir and Talukdar (2004)
E17	Corstjens and Lal (2000)	E37	Putsis and Cotterill (1999)	E57	Sudhir and Rao (2006)
E18	Cotterill and Putsis (2000)	E38	Raju et al. (1990)	E58	U.S. National Food Marketing Commission (1966)
E19	Cotterill et al. (2000)	E39	Raju et al. (1995b)	E59	Verhoef et al. (2002)
E20	Cunningham et al. (1982)	E40	Rao (1991)	E60	Ward et al. (2002)
				E61	Wills and Mueller (1989)

Table A.2 Analytical Results Related to Retailer (Store Brand) Marketing Strategies

Result no.	Result	Brief explanation	Analytical studies supporting result[a]	Empirical studies supporting result[b]
R1	Higher price substitutability between the national brand and the store brand increases retailer profits from store brand introduction.	Retailers generally obtain a higher margin on private labels than on national brands. A close substitute makes more consumers switch from the lower-retail-margin national brands to the higher-retail-margin store brand. Hence, a retailer gains more profits. Another explanation: When a retailer introduces a store brand that is a close substitute of the national brand (similar in quality), it makes the national brand manufacturer more dispensable. Hence, the retailer is able to increase its negotiation power and get a better price and other terms of trade from the manufacturer, thus increasing the retailer's category profits.	A2, A3, A6, A7, A8, A9, A11, A14, A15, A17, A18, A20	E3, E4, E7, E8, E12, E13, E17, E18, E20, E21, E24, E25, E27, E28, E32, E42, E43, E47, E50, E52, E53, E58 (S)[c]
R2	Retailer profits from store brand introduction can increase with an increase in quality of the store brand.	It is profitable to introduce a high-quality store brand because a high-quality store brand helps differentiate retail stores and create store brand loyalty and store loyalty.	A5, A6, A14, A15	E8, E17, E18, E21, E24, E25, E28, E41, E42, E47, E50, E52, E53, E56 (S)[c] E3 (K), E19 (N)
R3	Other things equal, higher price substitutability among the national brands decreases retailer profits from store brand introduction.	When national brands compete intensely on price (e.g., Coke and Pepsi), the national brand retail prices go down considerably. This would force the store brand to be priced even lower, leaving little room for the store brand to be profitable. Thus, the retailer may be better off exploiting the competition among the national brands than introducing a store brand.	A6, A14, A15	E39 (S)
R4	It is profitable for the retailer to introduce a store brand in categories with a large number of national brands.	The introduction of a store brand reduces the retailer's profits on the national brands. However, if there are a large number of national brands to begin with, the introduction of an additional store brand does not affect the retailer's profits on the national brands as much. In other words, it is easy to sneak in a store brand without affecting the retailer's profits from the existing brands, if the number of national brands is large.	A14	E39, E47(S) E46 (K)

Table A.2 (Cont'd.)

Result no.	Result	Brief explanation	Analytical studies supporting result[a]	Empirical studies supporting result[b]
R4A	When there are several national brands on the market, it is less profitable to introduce a store brand than when there are fewer national brands.	Private labels tend to produce recognizable imitations of established brands but charge a lower price. If national brands are proliferated such that leading brands have small shares, the market share of a private label that is imitating such a brand will be low, thus reducing its profitability and attractiveness. In other words, when there are already many national brands, it is difficult for a store brand to enter and sell large enough quantities to be profitable.	A19	E46 (S) E39, E47 (K)
R5	When conditions are conducive for store brands, the higher the category sales, the greater the profit incentive for a retailer to introduce a store brand.	Retailers gain profits from the sale of their store brands. Store brand gross profit equals category sales $\times$ SB market share $\times$ SB gross margin. For given SB margins and SB shares, higher category sales implies higher profitability for the retailer to cover fixed costs and earn profits.	A6, A14	E16, E28, E39, E47 (S) E48 (N)
R6	High margin categories are more attractive for a retailer to introduce a store brand.	For the same level of sales, high margin categories have greater potential to yield high profits. Retailers can exploit this potential to a greater extent by introducing a store brand.	A6, A14	E16, E28 (S) E48 (N)
R7	Large economies of scale in manufacturing (i.e., the ability to drive down manufacturing cost by producing large quantities) will encourage store brand introduction.	When there is high economy-of-scale advantage, national brand manufacturers can reduce cost by producing in large quantities. The excess production can then be supplied as store brands to retailers.	A12	E16, E23 (S)
R8	For the same average preference for a store brand in a market, the greater the consumer heterogeneity (variation) around the mean preference, the lower the incentive to introduce a store brand.	If the market is more homogeneous in terms of preferences, then the consumers are concentrated. Retailers can position the store brand to the homogeneous market and get large sales and profits. If the preferences are widely dispersed, it is difficult for the retailer to position the store brand in one particular concentrated segment and gain high profits.	A11	
R9	Retailer's margin and profits on the national brand increases with the introduction of a close store brand substitute.	When a close store brand substitute is introduced, because of increased competitive pressure, both the wholesale price and the retail price of national brand go down. However, the decrease in retail price is less than the decrease in wholesale price, with the result that the retail margin on the national brand increases.	A8, A9, A11	E1, E35 (S)
R9A	Retailer's margin and profits on the national brand decreases with the introduction of a close store brand substitute.	When a close store brand substitute is introduced, because of increased competitive pressure, both the wholesale and retail price of a national brand goes down. Because the national brand faces increased competition from the store brand, retailers' margin and profits on the national brand also go down.	A14, A15, A17, A18	E1, E35 (K)
R10	When a private label is viable, retailers' gross dollar profit margin on private labels is generally greater than the retailer's gross dollar profit margin on national brands.	Double marginalization (i.e., having to pay the wholesale price to the manufacturer) squeezes the retailer's margins on national brands. However, because store brands are generally directly obtained from the supplier, there is no double marginalization; hence, the retail margins are higher on the private label.	A2, A8	E6, E54, E58 (S) E1, E10, E17 (K)
R10A	When a private label is viable, retailers' gross percentage profit margin on private labels is generally greater than the retailers' gross percentage profit margin on national brands.	Same explanation as above.	A2, A8	E1, E6, E17, E54, E58 (S) E10 (K)
R11	Cost permitting, it is more profitable for a retailer to target the leading (#1 share) national brand than to target the #2 or #3 national brands.	When a store brand targets the leading national brand, the retailer is able to extract better terms of trade, thus lowering wholesale price and increasing retail margin on the national brand. In addition, by targeting the high-share brand, the retailer sells greater quantities of the store brand, thus increasing profits from both the national brand and the store brand.	A17, A20	E44, E47 (S)

Table A.2 (Cont'd.)

Result no.	Result	Brief explanation	Analytical studies supporting result[a]	Empirical studies supporting result[b]
R12	It is better to carry two store brands when the two national brands are differentiated than when they are substitutes.	When national brands are differentiated (low cross-price sensitivity), it is more appropriate to have two store brands to target each of the different national brands and extract profits from them.	A18	E45 (S)
R13	It is better to carry two national brands when the ratio of market share of top two national brands is low (close to 1).	For a retailer to carry two store brands, the second national brand should also be somewhat strong (high market share) so that it is profitable to position against that brand. Therefore, the ratio of the two market shares should be small (closer to 1) for the retailer to carry two store brands.	A18	E45 (S)
R14	When two national brands are differentiated across feature and quality, a higher-quality store brand is better off feature positioned closer to the stronger (higher quality) national brand, while the lower-quality store brand is better off positioned closer to the weaker (lower quality) national brand.	When the national brands are differentiated, it is best to position against one of the national brands rather than position in the middle. This is because positioning in the middle yields little sales from either of the brands and, hence, lower profits. However, if the national brand is higher quality but the store brand cannot match that quality, positioning the store brand as a knock-off of the strong national brand may not be convincing enough to generate demand. Therefore, a lower-quality store brand is better off imitating the weaker national brand.	A3	
R15	When two national brands are undifferentiated in the feature dimension, it is optimal for the private label to feature differentiate from the national brand. The higher the private label quality, the more it can differentiate.	Feature differentiation of the private label is optimal when the national brands are not feature differentiated because of the value consumers place on variety. For example, one consumer buys national brand pasta for herself, which is available in small packages, but provides store brand pasta for her son in large packages that is not available in any of the national brands. In this case, package size feature differentiates between national brand and store brand and provides the store brand with healthy sales and profits while maintaining retail sales and profits from the national brands.	A3	
R16	As the price substitutability between national brand and store brand increases, store brand share increases.	A close store brand substitute for a national brand makes more people switch from the national brand to the store brand for the same price differential, thus increasing store brand share.	A8, A9, A14, A15, A17, A18	E5, E11, E16, E21, E24, E28, E30, E37, E48, E53 (S)
R17	A high-quality store brand will generally command a high market share in equilibrium.	A high-quality store brand develops brand loyalty and thus can command reasonable sales even when its price is not much lower than that of the national brand.	A7, A14	E5, E11, E16, E21, E24, E28, E30, E37, E48, E53 (S)
R18	When national brands compete intensely with one another on price, store brand share will be lower.	The intense price competition among national brands will drive their prices down. Because of lower national brand prices, the store brand will not be in a position to offer a significant price advantage to consumers for switching to the store brand; hence, the store brand share will be lower.	A14	E39 (S)
R19	The larger the number of national brands, the smaller the share of store brand.	The same pie (total category sales) has to be divided among a larger number of competing suppliers.	A14	E21, E28, E33, E39, E48 (S)
R20	Store brand market share increases with the price differential between national brand and store brand.	When the price differential increases, the price of the store brand is much lower than the price of the national brand; therefore, more consumers switch from the national brand to the store brand.	A8, A9, A11, A14, A15, A17, A18	E5, E21, E27, E60 (S)
R21	In a cross section of product categories where retailers sell both national brands and store brands, the private labels market share is inversely related to the price differential. That is, private label shares are higher in categories where the price differential between national and store brands is smaller.	If consumers are more sensitive to the difference between national brand and store brand prices, they are likely to switch brands in significant numbers even when the price differential is low. Therefore, in categories where the cross-price sensitivity is high, the retailer can set a low price differential and still obtain a large market share, hence the negative correlation.	A8, A15	E18, E31, E36, E48, E61 (S) E19 (K) E28 (N)

Table A.2 (Cont'd.)

Result no.	Result	Brief explanation	Analytical studies supporting result[a]	Empirical studies supporting result[b]
R22	As the common costs of the national brand and the store brand (e.g., raw material costs) increase by the same amount, store brand share decreases.	High-priced, high-quality national brands can absorb cost increases better than low-priced store brands because costs represent a significant portion of the total price for low-priced brands. Thus, if costs on two substitute goods increase by the same amount, real income held constant, consumers shift to consumption of the higher-quality product.	A8	
R23	When the retailer introduces a store brand that is a close substitute of the national brand, both the wholesale price and the retail price of the national brand go down.	The competitive pressure from the quality-equivalent store brand forces the national brand manufacturer to bring down its wholesale prices and the retail prices also decrease to compete with the store brand.	A8, A9, A11, A14, A15, A17	E55 (S) E29, E35, E60 (K) E10, E14 (N)
R23A	When the retailer introduces a store brand that is quality equivalent to the national brand in a market with low and high advertising-sensitive segments, both the wholesale price and the retail price of the national brand can increase.	When a quality-equivalent store brand is introduced, it is possible that both wholesale and retail price of the national brand go up, because the retailer can use the store brand to better discriminate between the low-advertising sensitive segment, who will be served with the lower-priced store brand, and the high-advertising sensitive segment, who will be offered the national brand at a higher price.	A21	E29, E35, E60 (S) E55 (K) E10, E14 (N)
R24	As the substitutability between national brand and store brand increases, i.e., as retailers close the quality gap between the national brand and the private label, the price differential between brands decreases.	Higher substitutability between the national brand and store brand means that for the same price differential between the national brand and store brand, the store brand can draw more national brand consumers. Hence, the retailer is able to increase the store brand prices, keep the price differential between the two brands low, and still maintain healthy sales.	A4, A8, A9, A11, A14, A15	E15, E37 (S)
R25	When the market is highly concentrated, with a few national brands accounting for a large market share, the percentage price differential between the national brand and the store brand will be higher.	Compared to when there are many national brands in a highly competitive market, when the market is concentrated, the few dominant national brands have high market power and therefore can charge a premium over the store brand.	A4	E15 (S)
R26	Other things equal, the price differential between national brands and store brands is generally higher when national brands are heavily advertised than when they are not heavily advertised.	National brand advertising makes those brands less substitutable with the store brands. Furthermore, advertising implies market power, barriers to entry, and greater product differentiation, and also acts as a signal of quality. Therefore, national brands can charge higher prices relative to the store brand in more highly advertised categories than in less-advertised categories.	A1, A4	E15, E37 (S)
R27	As loyalty for a store brand increases, that is, it takes a larger price differential to switch store brand consumers, the store brand should be promoted less often.	The primary purpose of a store brand discount is to protect its own base from encroachment by the national brands. If store brand loyalty is higher, then sales are not threatened by the national brand manufacturer and therefore the retailer does not discount often.	A13	
R28	As loyalty for a store brand increases, the depth of the store brand discount decreases.	When a store brand has high loyalty, the national brand needs to discount deep to get the store brand consumers. For the same reason, the store brand does not have to offer deep discounts to protect its turf because consumers are already loyal to the store brand.	A13	
R29	When there are very few customers who prefer the store brands to the national brands (at equal prices), store brands should generally maintain a single constant price and should not be price promoted.	Price promotion is used by brand manufacturers to maintain high regular prices for its loyal customer base, but a manufacturer occasionally makes forays into the switcher segment through temporary price reductions. Since private labels have no significant loyal base, they are largely geared toward brand switchers and price shoppers. Therefore, maintaining a constant low price with little promotions is the optimal strategy for the store brands.	A7, A10, A16	E2, E9, E38, E49, E58 (K)

Note. S, empirical studies that support the result; K, empirical studies that contradict the result; N, studies with nonsignificant results.

[a]The references corresponding to the study numbers are provided in Table A.1a.

[b]The references corresponding to the study numbers are provided in Table A.1b.

[c]Includes studies that showed a positive relationship between price sensitivity, quality sensitivity, perceived quality (all potential surrogates of price substitutability) and store brand share, store brand proneness, willingness to pay for store brands, and store brand margins and profits (all potential store brand success factors). See Sethuraman (2006, Table 1) for a compilation.

Table A.3 Analytical Results Related to Manufacturer (National Brand) Marketing Strategies

Result no.	Result	Explanation	Analytical studies supporting result[a]	Empirical studies supporting result[b]
M1	When faced with store brand competition, a dual branding strategy (producing private labels for the retailer) can increase manufacturer profits if and only if the national brand manufacturer has a cost advantage over competing independent private label suppliers.	By foreclosing sales from the independent private label manufacturer, the national brand manufacturer obtains more sales and more profits than it would have if it had sold only the national brand.	A9	E59 (S)
M2	An effective manufacturer counterstrategy in the face of store brand competition is to increase national brand quality and differentiate from the store brand to increase the national brand's market share and profits.	Lack of differentiation, whether in quality or feature, directly reduces the sales, margins, and profits for the manufacturer because the store brand can take away consumers of the national brand. Having a high-quality national brand creates barriers to imitation and protects national brands from sales erosion.	A3, A6, A8, A9, A11, A14, A15	E53, E59 (S)
M3	Given a high-quality national brand, it is important to advertise the national brand as high quality to differentiate it from the lower-quality store brand.	A national brand of high quality should communicate to the consumer that it is of high quality. The consumer will get the message and be willing to pay a premium for the difference in quality. If low-quality manufactures try to advertise and charge a high price, consumers will learn of this disguise and not pay such a high price at a future date.	A1	
M4	When the cost of supplying a private label does not increase with the quality of the private label, the national brand wholesale price decreases with an increase in store brand quality.	A high-quality store brand implies a stronger substitute for the national brand; hence, the national brand manufacturer is forced to reduce its wholesale price.	A2, A8, A9, A11, A14, A15	E22, E26, E36 (S) E35 (K) E14 (N)
M4A	When the cost of a private label increases with quality, the national brand wholesale price may actually go up with the introduction of a quality-equivalent private label.	There are two countervailing effects. First, when the quality of a private label increases, price competition with the branded product is more intense and leads to a decrease in the wholesale price of the branded product. However, a second effect leads into the opposite direction. When the quality of a private label increases, its marginal cost increases, reducing its price competitiveness. Thus, the manufacturer can increase the wholesale price of the branded product. The second effect is stronger, particularly when the national brand manufacturer has a cost advantage over the private label supplier.	A2	E35 (S) E22, E26, E36 (K) E14 (N)
M5	When store brand supply price is increased, the national brand's wholesale price increases.	As store brand cost increases, retailers need to price the store brand higher. This provides leverage for the national brand manufacturer to raise its wholesale price.	A11	
M6	If the manufacturer has adequate information about demand, a two-part tariff in the form of a quantity discount offered to the retailer on the national brand can discourage private label sales and increase manufacturer profits.	Quantity discount implies that the retailer gets lower wholesale price if he sells larger quantities of the national brand. This can encourage the retailer to sell more national brands, and in the process both the manufacturer and the retailer may be better off.	A9	
M7	Slotting allowances or offering a lump-sum payment to the retailer in return for not carrying a private label would not be a viable strategy for the national brand manufacturer in countering private label entry.	Because the retailer gets the store brand at cost, its margins on the private label is high. Hence, it can be shown that the manufacturer's increase in profits by not keeping the private label is less than the retailer's decrease in profits by not carrying the store brand. Thus, the allowance that the manufacturer should be willing to give to the retailer would not be enough incentive for the retailer not to carry the store brand.	A9	E57 (S)
M8	Distributing coupons randomly may not be an effective manufacturer counterstrategy to private label penetration.	A national brand coupon is effective when it attracts store brand consumers who are unwilling to pay a premium for national brands while maintaining sales from its loyal customers at the regular price. A randomly distributed coupon strategy could be used equally by loyal customers and price-sensitive customers. This essentially leaves manufacturer and retailer profits unchanged.	A9	

Table A.3 (Cont'd.)

Result no.	Result	Explanation	Analytical studies supporting result[a]	Empirical studies supporting result[b]
M9	A national brand coupon strategy specifically targeting the more price-sensitive store brand customers is an effective counterstrategy against private labels	A targeted coupon strategy acts as a good price discrimination mechanism. Consumers with low price sensitivity who are willing to pay a high price will continue to buy national brands at the higher prices. Consumers with moderate price sensitivity will switch to the national brand because of the coupons, which actually gives more money to the retailer and additional sales to manufacturer. The highly price-sensitive consumers continue to buy the store brand. With a coupon strategy, the regular price of a national brand increases and both the manufacturer and the retailer can earn higher profits.	A9	E34, E51 (S)
M10	If the leading national brand manufacturer also supplies the private label (dual branding), price promotions by national brands will also be reduced under certain conditions.	By offering a private label to the retailer, the providing manufacturer gives itself less incentive to promote because by promoting the national brand, it will be hurting private label sales from which it gets a share of the profit. At the same time, because the private label takes away some market share from competing brands, they have fewer resources available for promotion. The retailer also discourages competing manufacturers from promoting to protect its own sales.	A22	
M11	The larger the size of the consumer segment switching between national brands and store brands, the greater the likelihood for the retailer to obtain trade deals from national brand manufacturers.	When the size of the switching segment is large, the manufacturer has the incentive to attract those consumers (switchers) by offering temporary lower prices through trade deals.	A7	
M12	As loyalty for the (weak) store brand increases, that is, it takes a larger price differential to switch store brand consumers, national brands should engage in less-frequent price promotions.	When the store brand has high loyalty, the national brand will have to discount deep to get the store brand consumers to switch, which decreases the national brand profits. Thus, the manufacturer does not have an incentive to discount the national brand often.	A13	
M13	As loyalty for a store brand increases, that is, it takes a larger price differential to switch store brand consumers, national brands should be offered deeper discounts.	The regular price of a national brand caters to the national brand-loyal segment. By definition, high store brand loyalty means the national brand has to offer a large price differential to switch store brand consumers. Therefore, the national brand has to be offered at a deep discount to cater to the switchers.	A13	
M14	A strong (national) brand with high brand loyalty promotes less often than the weak (store) brand with low brand loyalty.	Both brands are essentially fighting for the consumer segment loyal to the weaker brand. To get these consumers, the stronger brand must also offer a lower price to its own loyal consumers, who are willing to pay the high regular price. Therefore, a price reduction is less attractive for the stronger brand, and hence, the national brand promotes less often than the store brand.	A13	E38, E58 (S) E9, E40, E49 (K)
M15	The average discount of a strong (national) brand with high brand loyalty is larger than average discount of a weak (store) brand with low loyalty.	The premium national brand keeps its regular price high to cater to its loyal customers. The store brand keeps its price low to attract the more price-sensitive customers. Temporary price discounts are offered by the stronger brand to switch the store brand consumers, while they are used by the store brand to retrieve them. Hence, because the regular price is high, the premium national brand has to offer deeper discounts.	A10, A13	E9, E49 (S)

Note. S, empirical studies that support the result; K, empirical studies that contradict the result; N, studies with nonsignificant results.

[a]The references corresponding to the study numbers are provided in Table A.1a.

[b]The references corresponding to the study numbers are provided in Table A.1b.

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