STORE-BRAND ENTRY AND THE VARIATION OF RETAIL PASS-THROUGH

Fred K.T KU
Department of Decision Sciences and Managerial Economics,
The Chinese University of Hong Kong
Hong Kong
fredku@baf.msmail.cuhk.edu.hk

ABSTRACT

Issues related to retail pass-through receive much attention from both academics and business practitioners. Both analytical and empirical works have been done to characterize and document the retail pass-through rates. However, scant attention has been paid to the change of retail pass-through when a retailer introduces a store brand. Based on evidence from scanner data, we investigate empirically the effects of store brand entry on retail pass-through. We find that the entry of store brand is generally accompanied by reductions in retail pass-through and that there are substantial variations in the reductions. We then examine the determinants of the magnitude of changes in pass-through, and evidence shows that the variations in pass-through changes are related to brand-specific and manufacturer-specific characteristics. In particular, retail pass-through reduces by a smaller magnitude for brands offering larger product varieties, belonging to a dominant manufacturer, having a greater margin against the retailer, and positioning at the higher-tier of market.

Keyword: Retail pass-through, Store brand, Retail and wholesale price, Private label
1. INTRODUCTION

Issues related to retail pass-through, a measure of how retail price responds to a change in wholesale price, have received considerable attention from both academics and business practitioners. Both analytical and empirical works have been done to characterize and document the retail pass-through rates in economics and marketing literature. It is found that there are substantial variations in pass-through both within and across product categories, and some studies provide us with valuable insights on how the variations are determined by investigating the relationship between brand-specific characteristics and the level of pass-through rates (e.g. Besanko, Dube, and Gupta (2005), Ailawadi and Harlam (2009), and Nijs et al. (2010)). However, little attention has been paid to the changes in retail pass-through when a retailer introduces a store brand. Our study is the first attempt to document and explain how retail pass-through changes with store-brand introduction. We use data from a major US supermarket chain in the Chicago area and it spans over 5 years and across 75 stores. The study is divided into two main parts. The first is an estimation of the pricing equations of the retailer, given wholesale prices, taking into consideration the store brand introduction explicitly. As shown by Moorthy (2005), a structural approach imposes extra numerical restrictions on the retail pass-through rates. To avoid such restrictions, the reduced-form approach, similar to that of Besanko, Dube and Gupta (2005), is used. Based on the reduced-form model, we identify pass-through rates without specific assumptions on the demand and vertical interaction, and hence the restriction mentioned by Moorthy (2005) is a non-issue.

The estimation results show that the entry of store brand is generally accompanied by an increase in retail prices of national brands, and most importantly, a reduction in retail pass-through. These findings are consistent with and complement the argument that store-brand introduction enhances the bargaining power of the retailer, and thus brings about a lower pass-through for manufacturers. We also find large variations in the magnitude of such reduction for different brands within the same product category.

Given the large variation, the second part of the study is an explanatory analysis aiming to identify the determinants of the magnitude of fall in pass-through. We find evidence that the variations in pass-through change are indeed related to brand-specific and manufacturer-specific characteristics. In particular, retail pass-through declines by a smaller magnitude for brands offering a larger product variety, belonging to a dominant manufacturer, having a greater margin against the
retailer, and positioning at the higher-tier of the market.

Overall, not only are the levels of retail pass-through affected by the characteristics of a brand and the manufacturer, its change is also related. In general, we find that the position of the manufacturers with weaker bargaining power vis-a-vis the retailer pre-entry becomes even worse with store brand – not only do they receive a lower pass-through rate pre-entry, they are also more vulnerable to store brand entry in terms of a larger decline of pass-through rates.

The rest of the study is organized as follows. In section 2, we first discuss the related literature on retail pass-through. Then in section 3, we present the reduced form approach of estimating the pricing equation and modeling retail pass-through. We discuss the estimated pass-through rates and characterize the variations in section 4. We then explore the determinants of variation in the impacts of store brand entry on pass-through in section 5 and the results are discussed in section 6. We summarize and conclude in section 7.

2. RELATED LITERATURE

We investigate the changes in retail pass-through rates with the introduction of store-brand and its determinants. In this section we first outline the recent analytical literature on retail pass-through, and then we briefly summarize the empirical studies.

2.1 Analytical Literature on Retail Pass-Through

The determination of retail pass-through has been studied extensively. We first briefly review the analytical modeling literature, and then discuss the empirical studies. Tyagi (1999) is one of the earliest researchers to view the retail pass-through as comparative static in the analytical modeling literature. He shows that the pass-through rate is determined by the form of demand function when there is a single-product monopoly manufacturer and selling is through a monopoly retailer. For example, while linear demand functions produce pass-through less than one, constant elasticity demand functions produce pass-through rates strictly greater than one. Further studies along these lines find that the retail pass-through depends not only on the specification of demand, but also on the form of the vertical strategic interaction as well as retailer conduct. For instance, Sudhir (2001) finds that for a logit demand and a category profit maximizing retailer, the manufacturer Stackelberg model generates a pass-through rate in-between zero and one, and the rate is inversely proportional to a brand’s market share, while a vertical Nash model generates a unit pass-through for both category profit-maximizing and brand profit-maximizing
retailer. Moorthy (2005) offers a general formulation of retail pass-through with category management and retail competition analytically and generalizes the model for any form of cost changes. He argues that empirical works that ignore retail competition (e.g. Chintagunta 2002 and Besanko, Dube, and Gupta 2005) and/or cross-brand pass-through (e.g. Dreze and Bell 2003) may result in biased estimates. However, McAlister (2007) argues that it is not likely that a retailer would consistently execute a policy of positive and/or negative cross-brand pass-through given the complexity of the decision-making process.

2.2 Empirical Literature on Retail Pass-Through

A large volume of empirical work has been done to support and verify the analytical studies. Early estimation of the pass-through rates includes studies by Chevalier and Curhan (1976), Curhan and Kopp (1987), Walter (1989), and Armstrong (1991). These studies use data of trade deals offered to a retailer during a given period of time and provide valuable insights to the actual interaction between the manufacturer and retailer. Recent empirical work includes Besanko, Dube, and Gupta (2005), Ailawadi and Harlam (2009), and Busse, Silva-Risso, and Zettelmeyer (2006). Besanko, Dube and Gupta (2005) examine the retail pass-through across brands and categories by making use a dataset of a major supermarket in the US. They find that pass-through varies substantially across different products. As suggested by the analytical literature, if a retailer practices category management, i.e., he maximizes retail profits by coordinating the retail prices of all brands and products in the same category, the retail price of brand $i$ will be sensitive to the wholesale price of brand $j$. In view of this, Besanko, et.al estimate not only the own-brand pass-through rates, but also the cross-brand pass-through effects – the change in retail price of brand $i$ associated with a change in wholesale price of brand $j$ and find statistical evidence of both positive and negative cross-brand pass-through effects.

Ailawadi and Harlam (2009) conduct a similar analysis by using data on all significant manufacturer funding and promotion activities by a major US retailer to estimate retail pass-through and assess its magnitude. Traditionally, one of the major weaknesses of empirical pass-through analysis is the lack of information on the direct payment between manufacturer and retailer. However, Ailawadi, et al are able to overcome this difficulty by the superiority of their dataset: all the promotional funding offered to the retailer and associated spending by the retailer are available, enabling them to perform a more accurate analysis. Consistent with other previous studies, they find the aggregate pass-through to be slightly over 100%, and there are large variations in the rate across manufacturers.

Busse, Silva-Risso, and Zettelmeyer (2006) use the data from the US automobile
industry to study how much trade promotion offered by manufacturers are pass-through to consumers under different schemes, namely ‘dealer cash’ and ‘customer cash’. They find that the pass-through rate varies to a large extent under the two schemes and suggest that the reason is due to information asymmetry. Instead of estimating the retail pass-through over a period of time, Meza and Sudhir (2006) focus on the change of retail pass-through over time for products with substantial seasonality in demand. Their work suggests that the nature of a product (loss-leader or regular product) play a role in the determination of retail pass-through, and empirical studies may seriously mis-estimate the pass-through rate by averaging over time.

Given the substantial variation in pass-through across different brands and product categories in the empirical literature, studies are conducted to locate the determinants of such patterns. Besanko, Dube, and Gupta (2005), for example, find that the larger the market-share of a brand and the higher the contribution of a brand to the category profit of the retailer, the higher is the retail pass-through. Similarly, Ailawadi and Harlam (2009) find that the brand’s market share and sales in other categories, which can both be regarded as a measure of market power, have a positive relationship with the pass-through rate. These evidences are consistent with the expectation that the manufacturers with greater market power receive greater pass-through because of the better bargaining position vis-a-vis the retailer. In addition, they also find that brands with higher retail price (relative to the category average) also receive higher pass-through, probably due the existence of loyal consumers and thus they hold a greater power over retailers.

However, despite the extensive research on retail pass-through behavior, there is a lack of study that examines the relationship between the pass-through rate and store-brand introduction. As mentioned earlier, this study aims to fill this gap by first estimating the changes in pass-through rates for different brands within a category, and then exploring the determinants of such changes using scanner data. In the next section we present our methodology.

3. **ESTIMATION OF PRE- AND POST-ENTRY RETAIL PASS-THROUGH**

3.1 **Modeling Retail Pass-Through**

We focus on the determination of retail prices for a given brand at the store level. In the data, retail and wholesale prices of each store are available. While all stores are from a single supermarket chain, there are variations in retail prices across stores for a particular week. We believe that the pricing and pass-through behavior of the (single)
retailer is dependent on store-level characteristics (such as demand and retail competition) and thus model the retail price at the store level instead of the chain level. This has two advantages. First, it assures that the wholesale prices are exogenous – as the wholesale prices are not likely to be strategically responsive to store-level retail prices. Second, it can avoid the bias resulting from the aggregation of store-level data to obtain the chain level data.

A reduced-form econometric model is used to estimate the pricing equations of the retailer. The advantage of this approach is that we can identify the pass-through rates without specific assumptions for the demand as well as the vertical structure of the supply side. As mentioned in Section 2, the form of demand function used (e.g., linear and logit) and the assumed vertical strategic interaction (e.g., vertical Nash and manufacturer Stackelberg) impose severe restrictions on the possible values of retail pass-through rates. Besanko, Dube and Gupta (2006) provide a very good summary on how the demand and supply structures impose constraints on possible retail pass-through rates. As the aim of our study is to investigate the pass-through rates and how they are affected by store-brand entry, it is important to relax such unnecessary constraints on pass-through rates. It is the fundamental reason for us not to specify the demand or the specific vertical structure, but instead adopt a reduced form approach.

If we assume that the retailer practices category management, that is, it maximizes category profit by collectively determining the retail prices of all brands in the category given the wholesale prices of all brands, then the retail price of one brand will be a function of not only its own wholesale price, but also the wholesale prices of other brands. The retailer may adopt a variety of strategies to set the retail price of a brand. In general, the optimal retail prices can be expressed as follows:

$$p_i = p_i^*(w_i, w_{-i}, z)$$

(1)

where $p$ is the retail price of brand $i$, $w$ is the wholesale price, and $z$ represents all other (observable or unobservable) factors that affect the pricing decisions of the retailer.

However, in business practice, it can be done only by complex model with a large number of parameters. It seems impossible for the retailer to change the retail price of each item when there is a change in the wholesale price of a competing product item. To keep the analysis realistic and manageable, we assume that there is no cross-brand effect on pass-though, and thus the retail price of one brand varies only with its own wholesale price. Mathematically, it can be expressed as:

$$p_i = p_i^*(w_i, z)$$

(2)

In the next sub-section we describe the dataset and provide descriptive statistics.
for the product category.

3.2 Data Description

The data used in our analysis are from one of the two largest supermarket chains in the Chicago area – the Dominick’s Finer Foods (DFF). The full dataset consists of a large number of variables including sales volume, retail prices, promotional activities and even store traffic for more than 300 weeks, or 7 years, in the 90s. It covers more than 140 stores and 25 product categories. The unique feature of the dataset, namely the presence of wholesale prices, in the form of retail profit margin, offers a valuable opportunity for researchers to study the manufacturer-retailer interaction, since wholesale prices are very usually unavailable in most of the similar datasets.

We use the soap category for our analysis. It spans around 276 weeks and 75 stores, and we identify 19 national brands in the product category. Dominick introduced the store-brand in week 298. Therefore, 176 weeks of pre-entry and 100 weeks of post-entry data are available for our analysis.

Most of the studies seldom distinguish between the manufacturer and the brand when studying vertical interaction. Thus it is usually assumed that each brand is owned by a different individual manufacturer and each single-product manufacturer interacts with the retailer in the vertical structure. However, it is possible that brands owned by the same manufacturer enjoy advantages of some kind, given the fact that their presumably larger manufacturer has a more favorable position in the bargaining. In the soap market, the different numbers of brands owned by manufacturers enable us to investigate how the bargaining power of a manufacturer (not a brand) affects the pass-through a brand receives. Table 1 below shows the major national brands, their manufacturers, as well as the average market shares.

<table>
<thead>
<tr>
<th>Brand</th>
<th>Manufacturer</th>
<th>Relative mkt share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dial</td>
<td>Dial Corporation</td>
<td>23.07%</td>
</tr>
<tr>
<td>Dove</td>
<td>Unilever</td>
<td>15.84%</td>
</tr>
<tr>
<td>Jergens</td>
<td>Kao Brands</td>
<td>11.41%</td>
</tr>
<tr>
<td>Ivory</td>
<td>Procter &amp; Gamble</td>
<td>10.33%</td>
</tr>
<tr>
<td>Zest</td>
<td>Procter &amp; Gamble</td>
<td>9.37%</td>
</tr>
<tr>
<td>Lever 2000</td>
<td>Unilever</td>
<td>8.58%</td>
</tr>
<tr>
<td>Softsoap</td>
<td>Colgate Palmolive Co.</td>
<td>8.32%</td>
</tr>
<tr>
<td>Irish Spring</td>
<td>Colgate Palmolive Co.</td>
<td>7.31%</td>
</tr>
<tr>
<td>Brand</td>
<td>Manufacturer</td>
<td>Pass-through rate</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>SafeGuard</td>
<td>Procter &amp; Gamble</td>
<td>5.58%</td>
</tr>
<tr>
<td>Caress</td>
<td>Unilever</td>
<td>4.96%</td>
</tr>
<tr>
<td>Coast</td>
<td>Procter &amp; Gamble</td>
<td>4.71%</td>
</tr>
<tr>
<td>Tone</td>
<td>Dial Corporation</td>
<td>4.30%</td>
</tr>
<tr>
<td>Clean &amp; Smooth</td>
<td>Reckitt Benckiser, Inc.</td>
<td>3.18%</td>
</tr>
<tr>
<td>Olay</td>
<td>Procter &amp; Gamble</td>
<td>2.98%</td>
</tr>
<tr>
<td>Camay</td>
<td>Procter &amp; Gamble</td>
<td>2.45%</td>
</tr>
<tr>
<td>Mr. Bubble Bath</td>
<td>Playtex</td>
<td>2.13%</td>
</tr>
<tr>
<td>Pure &amp; Natural</td>
<td>Dial Corporation</td>
<td>2.08%</td>
</tr>
<tr>
<td>Spirit Bath</td>
<td>Dial Corporation</td>
<td>1.78%</td>
</tr>
<tr>
<td>Shield</td>
<td>Unilever</td>
<td>1.50%</td>
</tr>
</tbody>
</table>

As suggested by Meza and Sudhir (2006), a retailer adopts different pass-through strategies, ceteris paribus, when the demand for a product experiences seasonal fluctuations. If we ignore this difference and estimate the pass-through rates for products with seasonal demand over time, (as is done in most of the studies in economics and marketing), the results may be misleading since retail prices may fall just because of the increase of price elasticity, without any change in wholesale prices. In other words, the estimated pass-through rate may over- or under-estimate the real rate if we ignore the change in the price elasticity of demand. In the soap category, as there is no obvious seasonal fluctuation in the demand, our analysis will not be vulnerable to this problem.

### 3.3 Empirical Specification of the Pricing Equations

As indicated earlier, we adopt a reduced-form approach in the estimation of the pricing equation. To explicitly capture the effect of store brand entry, we estimate the general pricing equation (2) by including an interaction term of wholesale price and a dummy indicating the presence of store brand in a market:

\[
p_i = c_0 + c_1 \text{promo}_i + \beta_1 w_i + \beta_2 (w_i \times SB) + \beta_3 \text{SB} + \epsilon
\]  

(3)

where \( \text{promo} \) is an index ranging from 0 to 1, indicating whether the store is offering a promotion for brand \( i \); and \( \text{SB} \) is a dummy variable which equals one if a store brand is present in a particular market (week-store) and zero otherwise.

We use the linear form because preliminary analysis shows that it yields a better fit to the data compared to the log-linear or the log-log form. Under this specification,
the pass-through rate before store-brand entry is given by $\beta_{1i}$, while the change of pass-through after the entry is given by $\beta_{2i}$. For instance, if $\beta_{2i}$ is not statistically different from zero, it means that the pass-through behavior of the retailer is probably not affected by the presence of a store brand. The remaining coefficient, $\beta_{3i}$, captures the impact of store brand on retail price (not the pass-through rate).

To check the robustness of our estimate to the specification of the econometric form, the log-log form

$$\ln(p_i) = c_0 + c_1 \text{promo}_i + \beta_{1i} \ln(w_i) + \beta_{2i} [\ln(w_i) \times SB] + \beta_{3i} SB + \varepsilon$$

is also estimated. The pass-through elasticities can be computed by differentiating $\ln(p)$ with respect to $\ln(w)$, which is given by $\beta_i$. In other words, when the wholesale price of brand $i$ increases by 1%, the retail price will increase by $\beta_i \%$. The pass-through rates can be computed by multiplying $\beta_i$ by the ratio of average retail price to average wholesale price of the associated brand. The estimates yielded are generally consistent with the linear model, which implies that our estimates are robust to the model specification.

Before we proceed to the estimation results, there is one final point to make. Because promotional activity is also strategic decisions made by the retailer, theoretically they should be considered endogenous in the pricing equations. However, Sudhir (2001) uses a similar scanner dataset to analyze the vertical strategic interaction between manufacturers and retailer, and he finds that treating promotional activity as exogenous variables does not result in endogeneity bias problem. We follow Sudhir (2001) for simplicity.

4. ESTIMATION RESULTS

A total of 1,453 store- and brand-specific pricing equations are estimated. In the coming sub-section we present the results pre-entry and discuss their robustness to the specification of retail pricing equation. We then present the effects of store-brand
entry on retail prices and pass-through estimates in section 4.2 and 4.3.

4.1 Pre-Entry Retail Pass-Through

Prior to the entry of store brand (SB=0), 91.6% of the estimated pass-through ($\beta_i$) are statistically significant and all but one is positive. As pass-through rates are believed to be positive, the negative one occurs probably by chance and we drop it from the analysis. The following is a histogram for the estimated pass-through rates.

![Figure 1 Estimated Pre-Entry Pass-Through Rates](image)

The mean and median pass-through rates are 1.08 and 1.07 respectively, implying that across all stores and brands, the retailer is, on average, passing through around 107% or 108% wholesale promotion to consumers in the soap category. However, a relatively large standard deviation (0.34) implies that there are substantial variations in the pass-through rates, and thus the mean and median pass-through rates may not be very representative and may lead to misperception. The lowest estimated pass-through rate is 0.18, while the highest is given by 2.19. About 55% of all the estimated pass-through rates are greater than 1. The result here is generally consistent with the findings of the literature. For example, Ailawadi and Harlam (2009) find that the aggregate retail pass-through is over 100%. While many manufacturers receive low pass-through, some get several times more in term of the change in retail price to the associated change in wholesale price. Besanko, Dube, and Gupta (2005) estimate
that 7 out of 11 of product categories have a mean pass-through rate close to or
greater than 1.

The brand-level results provide a clearer understanding of the situation prior to
the entry of store-brand. Table 2 below shows the average pass-through rate (across
stores), standard deviation, and coefficient of variation of the 19 brands.

First, we see that there are substantial variations in the pass-through rates across
different brands. For example, Irish Spring, receives an average pass-through of 1.45,
whereas Pure & Natural receives only 0.72.

Second, with a few exceptions, it seems that brands belonging to the same
manufacturer tend to receive similar pass-through rates. For instance, all 5 brands
belonging to P&G, except Camay (of which the pass-through is 0.9), receive a
pass-through higher than 1; 3 out of the 4 brands owned by Unilever also receive
similar retail pass-through. For Dial Corporation, except for Dial, all remaining 3
brands receive pass-through less than 1. The data gives an impression that
pass-through rates of different brands belonging to the same manufacturer may be
inter-related.

Third, the variations of retail pass-through across different stores, which implies
different location, are very different. For example, the coefficient of variation for
Shield and Mr. Bubble Bath are 43.07% and 40.62%, and it suggests that different
stores react very differently to a change in wholesale prices for these 2 brands. In
contrast, the coefficient of variation for Jergens and Ivory are just 4.02% and 6.10%,
implying that the pass-through behaviors of different stores are very similar for these
2 brands.

<table>
<thead>
<tr>
<th>Brand</th>
<th>Mfter</th>
<th>Pass-thr</th>
<th>Std dev</th>
<th>C.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irish Spring</td>
<td>Colgate Palmolive</td>
<td>1.45</td>
<td>0.14</td>
<td>9.85%</td>
</tr>
<tr>
<td>Softsoap</td>
<td>Colgate Palmolive</td>
<td>0.72</td>
<td>0.14</td>
<td>20.06%</td>
</tr>
<tr>
<td>Dial</td>
<td>Dial Corporation</td>
<td>1.15</td>
<td>0.11</td>
<td>9.24%</td>
</tr>
<tr>
<td>Pure &amp; Natural</td>
<td>Dial Corporation</td>
<td>0.72</td>
<td>0.22</td>
<td>29.81%</td>
</tr>
<tr>
<td>Spirit Bath</td>
<td>Dial Corporation</td>
<td>0.99</td>
<td>0.10</td>
<td>10.26%</td>
</tr>
<tr>
<td>Tone</td>
<td>Dial Corporation</td>
<td>0.69</td>
<td>0.19</td>
<td>27.13%</td>
</tr>
<tr>
<td>Jergens</td>
<td>Kao Brands</td>
<td>1.44</td>
<td>0.06</td>
<td>4.02%</td>
</tr>
<tr>
<td>Mr. Bubble Bath</td>
<td>Playtex</td>
<td>0.91</td>
<td>0.37</td>
<td>40.62%</td>
</tr>
</tbody>
</table>
Camay Procter & Gamble 0.90 0.11 12.29%
Coast Procter & Gamble 1.39 0.42 30.29%
Ivory Procter & Gamble 1.20 0.07 6.10%
Olay Procter & Gamble 1.60 0.19 11.63%
SafeGuard Procter & Gamble 1.30 0.26 19.78%
Zest Procter & Gamble 1.02 0.26 25.12%
Clean & Smooth Reckitt Benckiser 0.85 0.13 14.82%
Caress Unilever 1.25 0.20 15.66%
Dove Unilever 1.13 0.15 12.91%
Lever 2000 Unilever 1.07 0.13 12.14%
Shield Unilever 0.61 0.26 43.07%
Overall -- 1.08 0.34 31.19%

The results here are generally consistent with the findings of the literature. For instance, Besanko, Dube, and Gupta (2005) estimate the pass-through elasticities across 11 product categories, and convert the estimates into rates by multiplying the ratio of average retail price to average wholesale price. They find that there are large variations in retail pass-through rates for both across and within product categories. It is found that the retail prices of toothpaste (0.22) and paper towels (0.37) are relatively unresponsive to trade promotion, while the prices of beer (5.58) and oat cereal (1.90) are highly responsive. Our estimate of 1.09 indicates that retail prices of soap are quite responsive as well. For the within-product category, for example, they show that all but one brand in the detergent product receive pass-through ranging from 1.15 to 0.1. Thus our estimates are consistent with those given in Besanko, Dube, and Gupta (2005).

As mentioned previously, we compare the estimation results from the linear model and that from the log-log model to check for the robustness of results. Pass-through rates are computed by

\[
\frac{dp}{dw} = \frac{\ln(p)}{\ln(w)} \left( \frac{P_{avg}}{W_{avg}} \right)
\]

(5)

where \(\frac{\ln(p)}{\ln(w)}\) is the coefficient estimated by the log-log model, and \(P_{avg}\) and \(W_{avg}\) are

\footnote{The authors suggest that the exceptionally large pass-through for beer may be a result of loss leader pricing – a way to simulate the number of customers visiting the store. It is claimed that several brands of beer are usually used as traffic generator.}
the average (over time) retail and wholesale prices. The following histogram shows the estimated pass-through.

**Figure 2 Pass-Through Rates from Log-Log Model**

There are 1,300 significant estimates on retail pass-through rates\(^2\). The mean and median rates are given by 1.08 and 1.07, while the minimum and maximum are 0.17 and 2.25 respectively. The standard deviation of all pass-through elasticities is 0.34. The descriptive statistics are very close to the ones in the previous model, indicating that our results are robust to the specification of the pricing equation.

4.2 Impact of Store Brand Introduction on Retail Pass-Through

The effect of store brand entry on retail prices and pass-through rates are inferred by estimating \( \beta_{2i} \) and \( \beta_{3i} \). First, the impact on pass-through rates will be reported and then we will turn to the impact on retail prices.

Among 1,453 pricing equations, 983 (67.3\%) of the estimated \( \beta_{2i} \) (coefficient for the interaction term) are significant at the 0.1 level and 840 (57.8\%) are significant at the 0.05 level. Among all \( \beta_{2i} \) 68.8\% are negative and the mean and median are -0.33 and -0.44 respectively. In other words, the data shows quite a strong negative correlation between the store brand entry and pass-through rates. With the

\(^2\) 9 out of the 1300 brand- and store-specific pass-through rates are exceptionally large (ranging from 62.5 to 2141.9) and considered outliers and thus not included in the analysis.
introduction of store brand, the retailer passes through less to consumers in response to a trade promotion (reduction in wholesale price) offered by manufacturers.

Figure 3 Changes in Retail Pass-Through Rates

![Figure 3 Changes in Retail Pass-Through Rates](image)

The post-entry overall pass-through rate is estimated at 0.74, while the pre-entry rate is 1.08 as reported in the previous sub-section. This means that the pass-through on average drops by 31.5% post-entry. This findings complement the literature (e.g. Chintagunta, Bonfrer & Song 2002, Pauwels & Srinivasan 2004) that the introduction of store brand enhances the bargaining power of the retailer. To get a clearer picture, the following table shows the average, brand-specific retail pass-through and its changes after store brand entry.

<table>
<thead>
<tr>
<th>Brand</th>
<th>Post-entry Pass-Thr</th>
<th>Change in PassThr</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irish Spring</td>
<td>0.85</td>
<td>-0.59</td>
<td>-41.08%</td>
</tr>
<tr>
<td>Softsoap</td>
<td>1.28</td>
<td>0.56</td>
<td>78.72%</td>
</tr>
<tr>
<td>Dial</td>
<td>0.88</td>
<td>-0.27</td>
<td>-23.37%</td>
</tr>
<tr>
<td>Pure &amp; Natural¹</td>
<td>-0.02</td>
<td>-0.74</td>
<td>-102.25%</td>
</tr>
</tbody>
</table>

³ 26 out of 68 (38.2%) post-entry pass-through estimates turn out to be negative. If we ignore those negative estimates, the brand post-entry pass-through rate is 0.02.
As we can see from table 3, there are substantial variations in the impacts of pass-through for different brands: while some brands receive higher retail pass-through, the majority (12 out of 19) receives a lower rate. The decrease in pass-through rates can be as large as 86% after the introduction of store-brand. In the next section we will conduct an explanatory analysis on these variations to see how the impact of store-brand entry is related to the characteristics of the manufacturers and brands. But before that, let’s take a look at the impact of store brand introduction on retail prices.

4.3 Impacts of Store Brand Introduction on Retail Prices

We now turn our focus to the impact of store-brand entry on the retail prices. It is estimated by $\beta_2 w_i + \beta_3$, and we evaluate these values by the associated mean wholesale prices. The mean and median are both slightly but significantly positive (0.0015 and 0.0014), indicating that on average the retail prices rise slightly in the post-entry period. The result is consistent with the literature. For example, Soberman and Parker (2006) and Gabrielsen and Sorgard (2007) suggest that store-brand introduction can help a retailer achieve price discrimination and thus the price of

---

*Camay* is present in 77 stores but just 14 of them yield significant estimates on the effect of store-brand entry. The impacts are so negative that they turn all the estimated post-entry pass-through rates to be negative numbers.
national brands can rise. Geylani, Jerath, and Zhang (2009) find that, in addition to its role in price discrimination, store brand can be used to shield consumers loyal to the national brand from price sensitive one-stop shoppers, and thus retail prices of national brands can rise.

Another possibility is that a retailer usually enjoys a larger margin on store brand when compared with the national brands. Given that a store brand usually enters the market at the lower end, there may be incentive for the retailer to raise prices of the competing national brands and avoid the cannibalization of profit.

Table 4 below shows the average change in retail prices per oz of each brand with respect to the entry.

<table>
<thead>
<tr>
<th>Brand</th>
<th>mean change</th>
<th>% change</th>
<th>Pre-entry retail price</th>
<th>Post-entry retail price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pure &amp; Natural</td>
<td>0.0057</td>
<td>5.78%</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>Shield</td>
<td>-0.0094</td>
<td>-6.73%</td>
<td>0.14</td>
<td>0.12</td>
</tr>
<tr>
<td>Irish Spring</td>
<td>0.0052</td>
<td>4.36%</td>
<td>0.12</td>
<td>0.13</td>
</tr>
<tr>
<td>SafeGuard</td>
<td>-0.0014</td>
<td>-1.00%</td>
<td>0.15</td>
<td>0.13</td>
</tr>
<tr>
<td>Coast</td>
<td>-0.0003</td>
<td>-0.21%</td>
<td>0.14</td>
<td>0.13</td>
</tr>
<tr>
<td>Softsoap</td>
<td>-0.0148</td>
<td>-9.42%</td>
<td>0.16</td>
<td>0.14</td>
</tr>
<tr>
<td>Zest</td>
<td>0.0025</td>
<td>1.73%</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>Ivory</td>
<td>0.0043</td>
<td>3.32%</td>
<td>0.13</td>
<td>0.14</td>
</tr>
<tr>
<td>Clean &amp; Smooth</td>
<td>0.0116</td>
<td>9.41%</td>
<td>0.12</td>
<td>0.14</td>
</tr>
<tr>
<td>Mr. Bubble Bath</td>
<td>0.0012</td>
<td>0.89%</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>Camay</td>
<td>-0.0127</td>
<td>-7.88%</td>
<td>0.16</td>
<td>0.15</td>
</tr>
<tr>
<td>Jergens</td>
<td>-0.0017</td>
<td>-1.35%</td>
<td>0.13</td>
<td>0.16</td>
</tr>
<tr>
<td>Dial</td>
<td>-0.0013</td>
<td>-0.82%</td>
<td>0.15</td>
<td>0.16</td>
</tr>
<tr>
<td>Spirit Bath</td>
<td>0.0209</td>
<td>14.55%</td>
<td>0.14</td>
<td>0.17</td>
</tr>
<tr>
<td>Lever 2000</td>
<td>-0.0019</td>
<td>-1.11%</td>
<td>0.17</td>
<td>0.19</td>
</tr>
<tr>
<td>Tone</td>
<td>0.0046</td>
<td>2.59%</td>
<td>0.18</td>
<td>0.19</td>
</tr>
<tr>
<td>Caress</td>
<td>0.0075</td>
<td>3.43%</td>
<td>0.22</td>
<td>0.24</td>
</tr>
<tr>
<td>Dove</td>
<td>0.0014</td>
<td>0.57%</td>
<td>0.25</td>
<td>0.28</td>
</tr>
<tr>
<td>Olay</td>
<td>0.0068</td>
<td>1.61%</td>
<td>0.43</td>
<td>0.38</td>
</tr>
</tbody>
</table>

By investigating four product categories, including soap, Pauwels and Srinivasan (2004) point out that, in general, second-tier brands tend to retaliate against store brand entry by setting lower prices and/or offering more frequent trade promotions,
while premium brands tend to accommodate store brand entry by raising wholesale prices. However, there are two points worth noting. First, the general pattern that they find turn out to be more complex in the soap category since some brands, e.g., Dial, introduce higher-priced varieties and thus raise the average price. Thus, instead of competing against the store brand in price, some manufacturers enhance its competitiveness by variety, and Pauwels and Srinivasan (2004) are not able to capture this effect since they simply investigate the change in the average retail and wholesale prices. Second, Pauwel and Srinivasan focus only on four national brands in the category, namely Dove, Lever2000, Dial, and Ivory, and regard the first two as the premium and the latter two as the second-tier brands without clear justification. They then investigate the time series of retail prices and record the changes without identifying the reason for such changes. It is not clear whether their conclusion on the interactions between manufacturers and retailer is robust if we consider a more comprehensive picture. By identifying 19 national brands and 7 manufacturers, our analysis should be able to provide a more accurate and comprehensive picture.

The results that we find turn out to be slightly different from that found by Pauwels and Srinivasan (2004). Given a constant wholesale price and promotional activities, our regression analysis shows that 7 out of 19 brands have a lower price post-entry, and among those 7, only 2 belong to the 5 lowest-priced brands in the category. The intuition is that, as mentioned earlier, the retailer has an incentive not to reduce the retail price of second-tier brands to avoid keen competition in the lower-end of the market after it introduces the store-brand that offers a higher margin. By maintaining or even raising the retail prices of these national brands, the retailer can reduce cannibalization of profit in this segment.

On the other hand, with a fixed wholesale price and level of promotional activities, premium-priced brands tend to have a statistically significant higher retail price post-entry, even though the changes are relatively small. This indicates that the price discrimination motive or the shielding motive may be operating here.

It is noteworthy that a negative value for the estimated change in retail price pre- and post-entry ($\beta_{2i}w_i + \beta_{3i}$) cannot be directly translated into an actually lower retail price post-entry. The reason is obvious: the actual retail price depends not only on the presence of store-brand, but also on the wholesale price and promotional activities. For instance, a brand having a positive value for $\beta_{2i}w_i + \beta_{3i}$ can have a lower average retail price post-entry if the manufacturer offers a more significant and/or frequent trade promotion to the retailer.

The above results are robust to the specification of the pricing equations. Linear
form and log-log form produce very similar estimates.

5. EXPLANATORY ANALYSIS ON THE VARIATION OF IMPACT OF STORE-BRAND ENTRY

In the previous sections we estimate and document the changes in pass-through rates of various national brands. It is found that the changes in pass-through rates vary significantly within the category. In this section, we focus on explaining such variation by identifying its determinants. While there are studies to explore the determinants of pass-through variation (e.g. Besanko, Dube, and Gupta 2005, Walter 1989, Lal and Narasimhan 1996), there is basically no investigation on how changes in pass-through rates are determined when a store brand is introduced to the market. The analysis is performed by a second stage pooled regression of the estimated changes in pass-through rates on the characteristics of brands, manufacturers, and stores.

5.1 Empirical Specification

We specify the following model to capture the effects of the characteristics of the brand and manufacturer, as well as store-specific demographic variables. We use the linear-log form because it gives the best fit compared to other specifications. This way, we can estimate how the variation in the impact of store-brand entry on pass-through is associated with a one-percentage change in the regressor.

\[
\hat{\beta}_{2i} = \alpha + \delta_1 \log(BRANDUPC_i) + \delta_2 \log(MFTERBRAND_i) \\
+ \delta_3 \log(MARGIN_i) + \delta_4 \log(MKTSHARE_i) + \delta_5 \log(RETAILPRICE_i) \\
+ \delta_6 [\log(MFTERBRAND_i) \times \log(RETAILPRICE_i)] \\
+ \delta_7 \log(INCOME_i) + \delta_8 \log(HSIZEAVG_i) + \delta_9 \log(SPHHURR_i) + \epsilon_i
\]  

(6)

where

- \(BRANDUPC_i\) is the number of product items owned by brand \(i\);
- \(MFTERBRAND_i\) is the number of brands owned by the manufacturer of brand \(i\);
- \(MKTSHARE_i\) is relative market share of brand \(i\) in a store
- \(RETAILPRICE_i\) is the average retail price;
- \(MARGIN_i\) is the retail margin.

To account for the estimation error in the dependent variable \(\hat{\beta}_{2i}\), weighted least squares is used for which the weight is given by the inverse variance of the estimates. We use only the significant estimates obtained previously in the second stage
regression. To check for robustness, the linear model:

$$\hat{\beta}_{2i} = \alpha + \delta_i \text{BRANDUPC}_i + \delta_2 \text{MFTERBRAND}_i$$
$$+ \delta_3 \text{MARGIN}_i + \delta_4 \text{MKTSHARE}_i + \delta_5 \text{RETAILPRICE}_i$$
$$+ \delta_6 \text{MFTERBRAND}_i \times \text{RETAILPRICE}_i$$
$$+ \delta_7 \text{INCOME}_Z + \delta_8 \text{HSIZEAVG}_Z + \delta_9 \text{SHPHURR}_Z + \epsilon_i$$

is also estimated. The results are similar but the goodness of fit is lower for the linear model.

Before proceeding to the estimation results, we will discuss the intuition of including the variables above.

The number of product items owned by a brand (\text{BRANDUPC}) and the number of brands owned by a manufacturer (\text{MFTERBRAND}) measure, on one hand, the product variety, and on the second, perhaps more importantly, the relative bargaining position of the brand/manufacturer against the retailer. Since these brands are available nationwide and manufacturers are not likely to be responsive to individual retailer’s behavior, \text{BRANDUPC} and \text{MFTERBRAND} can safely be assumed to be exogenous.

In the soap category, the number of product items owned by a brand varies from 1 to 19, which provides enough variation for estimation.

It is noteworthy that the number of brands owned by a single manufacturer measures the size, or indirectly the bargaining power, of a manufacturer, not a brand. Existing literature usually assumes that each brand interacts with the retailer individually, even though it belongs to a manufacturer who holds a large number of brands. Intuitively, in addition to the size of a single brand, the size of the manufacturer of the brand should also play an important role in the negotiation. For instance, while \text{Coast} may not be regarded as a very dominant national brand, measured in terms of product items and market share, its manufacturer, \text{Procter & Gamble}, obviously makes it enjoy a better position in bargaining against retailers. While the practice of multi-branding can provides each line of product a unique identity and helps the manufacturer position its products for different market segment, it does not necessarily mean that the negotiations between retailer and brands are totally independent.

The unit retail margin of a product is usually used to approximate the relative bargaining power between manufacturer of national brands and retailer, and it is well-documented in the literature that store-brand introduction provides a retailer with greater bargaining power. It will be interesting to see how the change in retail pass-through post-entry depends on the retail margin. As mentioned in early section, the unique feature of DFF database enables us to explore this relationship explicitly as the retail profit margin of each product item is available. There are at least two ways
to measure the retail profit margin. The first one is given by the absolute difference between wholesale and retail price of a brand: $\text{RET\_MARGIN} = (p_c - w_c)$, while the alternative way is to measure the relative profit margin: $\text{MARGIN} = \frac{p_c - w_c}{p_c}$. We use the absolute margin in our estimation, and to check the robustness, the model using relative margin is also estimated.

As mentioned earlier, it is widely recognized in the literature that market share of a brand play an important role in the determination of retail pass-through. Besanko, Dube and Gupta (2005), Pauwels (2007), and Ailawadi and Harlam (2009) find that national brands with small market shares suffer from receiving a lower retail pass-through. We would like to see how the drop of retail pass-through due to store brand introduction depends on market share as well by including a variable of market share in the regression.

The retail price of a national brand reflects its positioning strategy. Store brand mostly enter the lower end of the market, and thus face fiercer competition from the brands positioned at the similar segment. As the retail margin is higher for the store brand, the retailer may have a larger incentive to raise the retail price and cut back the pass-through on lower-priced national brands so as to reduce the cannibalization of profit in this segment. In contrast, higher-priced brands are less subject to this concern as the target consumers are different. Thus, it is reasonable to suspect that the positioning of a brand will have an impact on the change of retail pass-through when the retailer introduces a store brand. Moreover, to capture the possible interaction between the positioning strategy and the bargaining power of manufacturer, two interaction terms involving retail price of a brand are included in the regression.

We include three store-specific demographic variables, namely medium income, average size of households, and the percentage of hurry shoppers, in the second stage regression for two reasons. First, it is well-documented in the literature that the level of retail pass-through is related to demand (e.g. Tyagi 1999, Sudhir 2001, Meza and Sudhir 2006). It will be interesting to see if the changes in pass-through are related to the demand characteristics as well. Second, the entry of store brand may affect the demand characteristics and thus change the pass-through behavior of a retailer. For example, if the demand becomes more elastic, we expect to see higher pass-through of trade promotions. The presence of demographic variables can help capture the changes in store-level demand characteristics, if any, and control for its potential impact of pass-through.

6. RESULTS FROM SECOND STAGE REGRESSION
We find significant impacts of the characteristics of the manufacturers and brands on the determination of variation in store brand, while the demographic variables are all insignificant. The following table summarizes and presents the results.

Table 5 Determinants of Variation in Pass-through Changes Post-Entry

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Variation in Pass-through Rates Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
</tr>
<tr>
<td>BRANDUPC</td>
<td>0.501996**</td>
</tr>
<tr>
<td>MFTERBRAND</td>
<td>0.329839**</td>
</tr>
<tr>
<td>RET_Margin</td>
<td>-0.577871**</td>
</tr>
<tr>
<td>MKTSHARE</td>
<td>-0.069681**</td>
</tr>
<tr>
<td>RETAILPRICE</td>
<td>0.304299**</td>
</tr>
<tr>
<td>MFTERBRAND x RETAILPRICE</td>
<td>0.126877**</td>
</tr>
<tr>
<td>BRANDUPC x RETAILPRICE</td>
<td>0.08425**</td>
</tr>
<tr>
<td>INCOME</td>
<td>-0.827171</td>
</tr>
<tr>
<td>HSIZEAVG</td>
<td>-0.104072</td>
</tr>
<tr>
<td>SHPHURR</td>
<td>0.066143</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>-0.496967</td>
</tr>
<tr>
<td>R-squared</td>
<td></td>
</tr>
</tbody>
</table>

Note: Coefficients with $p<0.05$ are marked with double-star; and those $p<0.1$ are marked with single-star.

Let’s start from the demographic variables. Besanko, Dube, and Gupta (2005) find that demographic variables do not have significant effects when it comes to the determination of pass-through elasticities. Similar to their findings, in our analysis none of the demographic variables is significant. This suggests that there is no statistical evidence that the impact of store brand entry on pass-through depends on demographic variables, and the variations of pass-through across brand-store should mainly be due to brand-specific and manufacturer-specific characteristics.

Next, we turn our focus on the effects of the characteristics of the brand and manufacturers. The first 4 variables, BRANDUPC, MFTERBRAND, MARGIN, and RETAILPRICE, can all be regarded as some measure of bargaining power of the manufacturer / brand vis-a-vis the retailer; while RETAILPRICE represents the
positioning of a brand. We will discuss the results one by one.

The effect of the number of product items a brand owns is positive, implying that a brand consisting of a larger number of different product items receives a more favorable (or less unfavorable) pass-through post-entry. That is, the reduction of pass-through rates for those brands with more product items tends to be smaller. This could due to the differences in the manufacturers’ bargaining power: a brand with a large number of product items has a more favorable position when interacting with retailers, and thus the drop in retail pass-through post-entry is less significant. The reason may due to the size of a brand in the category, or alternatively, the product variety.

Similarly, the role of the manufacturer has a significant effect on the change in pass-through rates induced by the introduction of store-brand. We find that if a brand belongs to a large manufacturer (a manufacturer holding a larger number of brands), the reduction of pass-through will be less significant. This is consistent with our idea that a larger manufacturer is in a better position when bargaining with retailers in terms of obtaining a more favorable pass-through, relative to smaller manufacturers. For instance, even though Coast may not be a large brand measured in terms of product items or market share, the fact that it belongs to Procter and Gamble, one of the manufacturers which owns the largest number of brands in the market, lightens the reduction in pass-through post-entry. As we indicated earlier, the literature seldom considers the role of a multi-brand producer and assumes that each brand interacts with the retailer individually. Our result shows that this may not be an accurate representation of reality.

Our finding suggests that the higher the retail margin, the larger the drop in pass-through post-entry. This result is robust for the way we define retail profit margin (absolute or relative). One possible interpretation is that the relative bargaining power between the retailer and the manufacturers of different sizes become more extreme: the position of those manufacturers earning a low wholesale margin pre-entry becomes even worse, since they receive a larger fall in pass-through after the entry of store brand, whereas those enjoying a relatively high wholesale margin pre-entry receive a smaller drop in pass-through, implying that they are able to maintain their position and are less affected by the introduction of store-brand.

Our result also shows that national brands with smaller market share are relatively less vulnerable to the introduction of store-brand, measured in terms of the deterioration of retail pass-through that they receive. While Besanko, Dube and Gupta (2005) find that smaller-share brands are disadvantaged in terms of lower

\[5 \text{ As the price of a product must be positive, the marginal impact of } \text{MFTERBRAND} \text{ is positive.}\]
pass-through rate they receive, we find that the smaller the market share of a brand, the smaller the magnitude of decrease in retail pass-through.

Furthermore, the retail price of a brand is found to have a positive impact on the change in retail pass-through. It implies that the lower the price of a brand, the more the reduction in pass-through after the entry of store brand. This can be viewed as evidence that confirms our intuition: brands with lower retail prices target the lower end of the market, and thus they are directly competing against the store brand. Reducing the pass-through of trade promotion can benefit the retailer by limiting its impact on the demand for store brand. A related perspective is the store-traffic. It is well-recognized that premium brands are more likely to be regarded as loss-leaders by the retailer, and thus tend to receive a higher pass-through rate compared to other competing brands in the same product category (e.g. Meza and Sudhir 2006). The evidence that the pass-through rates drop less for higher-priced brands suggests that their role as a loss-leader is maintained from the retailer’s perspective.

Finally, the interaction terms are significantly positive in the model of pass-through rates. This indicates that while a brand which owns many product items and belongs to a large manufacturer receives more favorable terms relatively, the effect is significantly lessened if the brand is competing head-to-head with the store brand at the lower end of the market. This suggests a coherent story and is consistent with our intuition. Nevertheless, these estimates are insignificant in the model of pass-through elasticity ($MFTERBRAND \times RETAILPRICE$ is marginally significant at the 0.1 level), that implies further investigation is needed to confirm its robustness.

7. SUMMARY AND CONCLUSIONS

It is well documented that the market power of a manufacturer has a strong positive effect on pass-through. This result, combined with the extensive studies showing that the relative bargaining power of a retailer increases with the introduction of store brand, logically implies that retail pass-through should decrease with the entry of store brand. However, there is very limited research work that directly examines the impact of store brand introduction on retail pass-through, not to mention the pattern of such impact and its determinants. In fact, we are not sure who among the manufacturers suffers more in terms of pass-through received after the entry of store brand.

This study aims to find this missing element. We first estimate the retail pass-through rates at the brand-store level using a reduced form approach similar to Besanko, Dube and Gupta (2005). The advantage of this approach is that it does not impose additional restrictions on pass-through since, and there is no need to specify the demand structure and form of vertical strategic interaction. The main difference
between our model and that of Besanko, Dube and Gupta (2005) is that we explicitly take into consideration the effect of store brand introduction on retailer’s pricing decision given wholesale prices, and thus we are able to quantify the effect of store brand entry on retail pass-through. To the best of our knowledge there is hardly any study focusing on this issue. We find that pass-through rates decline post-entry of store brand in general, ceteris paribus. Our findings can complement the studies of store brand which argue that bargaining power shifts from the manufacturer to the retailer. At the same time, our result also shows that there are substantial variations in the magnitude of the decrease of pass-through – some brands suffer to a great extent by a sizeable decrease in retail pass-through, while others suffer less by a relatively smaller decrease.

Given our findings of such variations, we then explore the determinants of the impact of store brand entry. It is done by a second stage regression. Based on the estimated changes in pass-through, we find evidence that the variations of pass-through change are related to brand-specific and manufacturer-specific characteristics. In particular, a brand offering larger product variety, belonging to a dominant manufacturer, charging premium prices, and having a higher pre-entry margin against the retailer is less vulnerable to store brand introduction – the reduction of retail pass-through it receives tends to be smaller.

Overall, we find that brand-specific and manufacturer-specific characteristics do not only play a role in determining the level of retail pass-through, as suggested by the literature; they also affect the changes in pass-through when a retailer introduces a store brand. Combined with the findings from previous studies, we can see that the position of those manufacturers with weaker bargaining power vis-a-vis the retailer pre-entry becomes even worse – not only do they receive a lower retail pass-through, they are also more vulnerable to store brand entry in terms of a larger decline of pass-through.

There are some limitations to our analysis. First, like most other analysis of manufacturer-retailer interaction, the lack of data on fixed payments between the two parties makes our investigation incomplete. Second, we have data from one single retailer, and thus we are not able to consider the competitive issues at the retailing level. This may bias our results, especially if the products in the category are used as an instrument for retail competition. The good news is, compared with products like beer and carbonated soft-drink, soap is seldom used to attract store traffic and thus we believe this problem should not be serious. Third, as we do not build a model of demand, we are not able to explore the relationship between retail pass-through and demand conditions. Future research may be done to investigate in this direction.
8. REFERENCES


