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FMCG firms' margin management: consumer trade-offs among product price, quantity and quality

Stephen Wilkins^a and John J. Ireland^b

^a*Faculty of Business and Law, The British University in Dubai, Dubai, United Arab Emirates*

^b*Department of Business and Management, Rochester Institute of Technology Dubai, Dubai, United Arab Emirates*

Abstract

Margin management is an important aspect of marketing mix decision making. We argue that when production costs increase, product managers must eventually choose among three alternatives: raising selling prices, reducing pack quantities, or decreasing product quality. Thus, the purpose of this research is to ascertain consumer trade-off preferences – among product price, pack quantity and product quality – for different types of FMCG products. Adopting a choice-based conjoint analysis research design, the study used three samples of American consumers. It was found that for each of the three FMCG product categories tested, quality is the product attribute most favoured by the respondents. For two of the three products, pack quantity was rated the least important product attribute, suggesting that manufacturers may have a better chance of maximising profit by reducing pack quantity, rather than increasing price or lowering quality. In the context of margin management, this is, to our knowledge, the first study to examine consumers' preferences related to the trade-off between product price, pack quantity and product quality.

Keywords

Cost increases; pricing strategy; package downsizing; quality; consumer preferences; conjoint analysis

Introduction

Since the global financial crisis of 2007-2008, a large number of fast-moving consumer good (FMCG) firms have seen their margins squeezed as the costs of raw materials, labour and energy have risen steadily. Furthermore, in many countries, households carry excessive levels of debt, and individuals have faced declines in real income, negative real interest rates, and in some locations, increased unemployment. Historically, the adoption of cost-based or mark-up approaches to pricing has meant that many FMCG firms have reacted to increased input costs by passing these on to consumers through increased selling prices. For example, research by Lamm and Westcott (1981) found that on average food manufacturers passed on increases in resource prices to the retail level within two quarters. However, since 2007, many consumers are less likely to have the disposable income necessary to pay higher prices (Ferguson, 2014; Romei, 2017).

Although consumers may accept that firms need to increase prices when the firm's costs increase, consumers still expect to receive value from any purchase (Ferguson, 2014; Tarrahi, Eisend, & Dost, 2016). A consumer may perceive value as the relationship between price and quality (Yoon et al., 2014) or price and quantity (Çakir & Balagtas, 2014). If a consumer perceives that they would not receive value from a particular purchase, then they are more likely to forgo the purchase, or trade down to a cheaper product. With increased levels of

competition in many consumer markets, and consumers increasingly influenced by perceived value (PWC, 2010), it is vital that firms make the right trade-off decisions between product price, quantity and quality.

Thus, the purpose of this research is to quantify consumer trade-off preferences for different types of FMCG product when the manufacturer needs to react to increased input or overhead costs. This research is particularly original in a number of respects. Few previous studies have considered marketing mix decision making in the context of margin management, and of the many studies that have examined the relationship between price and demand, the vast majority have been concerned with price decreases (promotions) rather than price increases. Furthermore, while previous studies have considered consumer trade-off preferences between pairs of variables, such as price and pack quantity, or price and product quality, we are not aware of a study that has considered all three variables simultaneously in a situation where the consumer is worse off with every possible option. Thus, this research makes a unique contribution in helping researchers and practitioners better understand consumer preferences when making purchase decisions in tough economic environments, where the average consumer's real disposable income may be low or declining.

Margin management

In recent years, consumers have been increasingly unable or unwilling to pay higher prices. Many consumers forgo non-essential purchases, buy cheaper alternatives, or only make purchases when deep discounts or generous promotions are offered. A survey of consumer product executives in 2013 indicated that around 75% of firms globally had found it harder to sustain or grow operating margins after 2009 (EY, 2013). Firms' margins have been squeezed due to the inability of firms to increase selling prices, while raw material, input, labour, energy and distribution costs have increased.

Although marketers must consider a range of metrics – including number of units sold, overhead selling costs and market share – effective margin management is vital to ensure sustainable and improved returns over the longer term. As margins fall, firms find themselves under increased pressure to increase business volumes through first raising consumer expectations, and then successfully meeting these expectations (Clow & Beisel, 1995). For some products, such as those sold in business-to-business transactions, prices, margins, and other trade terms may be established through negotiation (Srivastava, Chakravarti, & Rapoport, 2000). However, for FMCGs, the manufacturer has to determine a product's selling price, pack quantity and specifications, such as the ingredients or materials used to produce it.

Firms may maintain or improve margins by tackling the sources of rising costs. Sometimes, it may be possible to negotiate improved terms with suppliers or distributors, but most usually, the firm has no influence over commodity and energy costs, or the general rates of pay for labour. Alternatively, firms can provide value for consumers by developing new products or introducing improvements to existing products, which may enable the firms to charge higher prices.

Many new products are unsuccessful, and continual product improvement is not possible in all product categories, either because the nature of the product is such that further improvements are not possible, or because the costs or risks involved are prohibitive. In such cases, it may be necessary for firms to focus on adjusting certain elements of the marketing mix, such as product price, pack quantity or quality. Eventually the consumer has to accept higher selling prices, reduced pack quantities or inferior product quality. The key question is thus, 'Which of these alternatives will consumers best accept?' This research quantifies consumer preferences on these marketing mix elements for three different carefully-chosen FMCG product categories.

Price

Determining the selling price of a product is one of the key marketing decisions that has to be made by product managers. Hinterhuber (2016) claims that firms often make poor pricing decisions because marketing executives hold inaccurate beliefs about pricing, such as (1) costs are the basis for price setting; (2) small price changes have little impact on profits; (3) customers are highly price sensitive; (4) products are difficult to differentiate; (5) high market share leads to high profits; and (6) managing price means changing prices. Many scholars have argued that value-based pricing is superior to cost and competition-based approaches (Liozu et al., 2012). In the current 'age of austerity', characterised by value-seeking consumers in highly competitive markets, marketers may need to forget their unproven assumptions and focus on developing sound pricing strategies that facilitate value creation for the consumer (Hinterhuber & Bertini, 2011).

Pricing decisions may have a disproportionate influence on a firm's revenue. For example, Marn and Rosiello (1992) found that a 1% price increase results in an average 11.1% increase in profit, whereas a similar increase in sales increases profit by only 3.3%. It is not surprising therefore that pricing strategy has been a popular topic for research. Kienzler and Kowalkowski (2017) identified 515 articles on pricing strategy published between 1995 and 2016. However, most of the previous research on price changes has focused on price decreases rather than price increases (Homburg, Hoyer, & Koschate, 2005). As there are times – particularly when costs are rising – that firms are forced to consider increasing prices, it is important for researchers to pay greater attention to the effects of price increases on consumer demand and firm profitability.

Very often, as the price of a product increases, the likelihood of consumer purchases decrease (Jaeger et al., 2011). To maximise profit, firms need to analyse products' price elasticity of demand, so that the maximum prices that consumers are willing to pay can be ascertained (Wang, Ventatesh, & Chatterjee, 2007). A product's price elasticity of demand may be influenced by many different factors, including competitive intensity in the category, whether or not the product is storable and the brand market share (Danaher & Brodie, 2000).

While the average price elasticity of demand is a useful figure, elasticity varies across consumers. Krishnamurthi and Raj (1991) found that loyal customers are less price sensitive in the brand choice decision than non-loyal customers, but more price sensitive in the quantity choice decision. In many cases, consumers' willingness to pay may be determined largely by product involvement, i.e., the relevance or importance the individual attaches to a product based on their inherent needs, values and interest (Sichtmann, Wilken, & Diamantopoulos, 2011). The purpose or context of a product's consumption may also have an impact on the price that consumers are willing to pay. For example, Kupiec and Revell (2001) found that higher-income consumers are willing to pay a premium price for a product when the product is to be used for a specific purpose or special occasion, e.g. providing a premium cheese for guests as an after dinner treat.

Consumers are more likely to notice and spend time considering/evaluating price increases when the product has higher monetary value or is purchased for a special occasion or purpose; when there are longer term consequences; and when there are higher psychological costs to the consumer (Oliver, 2010; Wilkins, Beckenuyte, & Butt, 2016). The demographic features of consumers have also been found to influence individual purchase decisions and attitudes to changes in price (Çakir & Balagtas, 2014). Research has concluded that lower-income consumers are significantly more conscious of price and value than higher income consumers (Steenhuis, Waterlander, & Mul, 2011).

Higher-income households are less sensitive to price increases and larger households are more price sensitive (Çakir & Balagtas, 2014). For food products, price may be a more important determinant of purchase decision than taste or quality, and higher prices often act as

a barrier to lower-income consumers eating healthier foods because these products are generally more expensive (Cassady, Jetter, & Culp, 2007). Education level has been found to be negatively associated with price sensitivity (Çakir & Balagtas, 2014), but education level as a variable for analysis in consumer choice research is often ignored because of its strong correlation with consumer income.

Quantity

As an alternative to increasing prices, firms have increasingly resorted to package downsizing. Package downsizing is the practice where package content/quantity is reduced, without a corresponding reduction in selling price, and where the package size and appearance stay the same, or the package is changed to hide the reduced content (Wilkins, Beckenuyte, & Butt, 2016). The popular media has often referred to package downsizing as 'shrinkflation'. In the United Kingdom, the government's Office for National Statistics (ONS) reported that between 2012 and 2017 more than 2,500 products had been subject to package downsizing (Milligan, 2017).

Package downsizing is a popular response of FMCG firms to cost increases because most consumers tend not to notice reduced pack quantity at the time of purchase (Wilkins, Beckenuyte, & Butt, 2016). Çakir & Balagtas (2014) found that a product's demand elasticity resulting from changes in pack quantity is approximately one-fourth of that resulting from changes in price. Firms get away with downsizing because most consumers do not read the content information on packaging, relying instead on visual estimations of the pack or bottle size (Lennard et al., 2001), or they rely on previous purchase experiences (Gupta et al., 2007).

Chandon and Ordabayeva (2009) found that consumers often underestimate the magnitude of downsizing. Consumers' perceptions of pack quantity may be greatly influenced by the pack shape and dimensions (height, width and length) (Yang & Raghurir, 2005). Ordabayeva and Chandon (2013) found that while many consumers perceive size reductions accurately when only one dimension of a package is reduced, they completely fail to notice up to a 24% downsizing when multiple dimensions of the product change, and when dimensions change in different directions (e.g., when the product is elongated).

Ferguson (2014) claims that in turbulent economic times, package downsizing may reduce consumer perceptions of real price increase unfairness. As larger households need to buy products in larger quantities than smaller households, it is not surprising that previous research has suggested that larger households are more sensitive to changes in quantity (Çakir & Balagtas, 2014). Single person or smaller households may be less sensitive to reduced pack quantity either because they purchase the product less frequently, and therefore the downsizing has less impact on their shopping routines, or because they perceive that the reduced quantity better matches their consumption/product use (Adams, Benedetto, & Chandran, 1991). In contrast, working mothers with lower income (and education), who undertake the entire family's food shopping, are more likely to be influenced by pack quantity (given that they need to purchase larger quantities) than product quality (Krystallis & Ness, 2005).

Quality

Perceived quality is a key factor in determining customer purchase decisions. Perceived quality may be defined as a consumer's judgement about a product's overall excellence or superiority (Zeithaml, 1988, p. 3). Consumers may use a range of criteria to determine perceived product quality, such as the quality or composition of a product's ingredients or raw materials; brand reputation; consumer research reports; and past experience. Consumers may perceive ingredient or component branding (e.g. NutraSweet and Canderel, as sweeteners in food products) as an indicator of a product's quality (Daud, 2013). If a manufacturer switches from

using branded ingredients/materials to reduce input costs, a consumer may perceive the 'new' product as being lower quality.

Consumers make purchases when they perceive that they are receiving value. Monroe (2002, p. 104) defines perceived value as the ratio of perceived benefits (the gain) to perceived sacrifice (the loss, or price paid). Quality and price are product attributes that contribute to an individual's value perception. A trade-off exists between product quality and price, and different consumers will prefer different quality-price mixes. For example, some consumers may prefer higher priced high quality products while other consumers may sacrifice some aspect of quality for a lower price.

When confronted with a new (higher) price or altered (reduced) quality, consumers need to decide whether the product still delivers value for them (Ko et al., 2011). The product features or attributes used by consumers to assess quality vary for different types of product according to their intended uses and benefits. It should also be noted that consumers in different countries perceive the price-quality relationship differently. For example, risk averse Chinese consumers are more likely to use price to infer product quality than American consumers (Zhou, Su, & Bao, 2002).

When a product's price is more readily observable than its quality, price is more likely to be a strong determinant of perceived value (Yoon et al., 2014). Consumers tend to select the 'prominent option' to avoid the difficulty of directly trading off product attributes (Carmon & Simonson, 1998). If price is a more prominent dimension than quality, the prominence effect suggests that consumers will base their purchase decision more on the attribute importance of price than the attribute values related to quality.

In practice, consumers are more likely to notice price changes than changes to a product's quality (Monroe, 2002). Thus, in response to cost increases, firms may believe that they can more easily 'get away' with reduced product quality than increased selling prices. Cheng (2012) found that large food manufacturers in China often reduce production costs by replacing healthy ingredients with cheaper and unsafe chemical additives. It is likely that in many cases consumers may be unaware that a manufacturer has changed a product's ingredients. Sometimes, in seeking cheaper input materials, manufacturers may become the victims of food crime, as demonstrated by the 2012 horsemeat scandal in Western Europe (Agnoli et al., 2016). This scandal involved many producers of pre-prepared foods using horse meat when they believed it to be beef.

For highly critical purchases, or those made for a specific purpose or special occasion, quality may be more important to consumers than price or other product attributes (Ostrom & Iacobucci, 1995). Higher-income consumers are also more likely to prioritise product quality over price or quantity when they are purchasing the product for a specific purpose or special occasion (Kupiec & Revell, 2001). In order to secure consistent or improved product quality, higher-income consumers generally have a higher tolerance of increased prices (Krystallis & Ness, 2005). Higher-income consumers are typically better educated and therefore more likely to prefer products that are tastier, healthier, better designed, safer, more reliable and more durable, but which are also more expensive.

Method

Research approach

The purpose of this research is to quantify consumer preferences for the key manufacturer alternatives to manage increased costs: to pay higher selling prices or accept lower pack quantity or product quality. Given that price is often more easily noticed by consumers than other product attributes (Wilkins, Beckenuyte, & Butt, 2016), absolute price has the potential to be a dominant influence on consumer choice decisions. Based on our literature review, we hypothesise that the demographic variable of consumer income will have the strongest

influence on consumer sensitivity to price and quality, and that household size will have the strongest influence on consumer sensitivity to price and quantity. Thus, we specify the following hypotheses:

- H1. Absolute price is positively related to consumer sensitivity to price.
- H2. Consumer income is negatively related to consumer sensitivity to price.
- H3. Household size is positively related to consumer sensitivity to price.
- H4. Household size is positively related to consumer sensitivity to quantity.
- H5. Consumer income is positively related to consumer sensitivity to quality.

Using an online conjoint survey questionnaire, respondents were asked to indicate their purchase choices for three different products: strawberry jam (representing a frequent use food); electric light bulbs (representing an essential non-food household item); and boxed chocolate confectionery (representing a discretionary spend product, as a treat for self or gift for another person). For price and quantity, respondents were offered three choices, representing high, medium and low levels. All prices were stated in US dollars. The jam and chocolate confectionery quantities were stated in ounces. The high and low values were approximately 5% higher and 5% lower than the medium values. The light bulbs were offered to respondents as multipacks containing 8 (high), 7 (medium), or 6 (low) light bulbs.

Quality was operationalised as percentage fruit content for the jam; number of hours life per bulb for the light bulbs; and percentage cacao content for the chocolate confectionery. Confectionery manufacturers such as Lindt emphasise cacao content as an indicator of quality, but we accept that this ingredient is more relevant to dark than milk chocolate. As for the other two product attributes, quality was offered in three levels at approximately 5% intervals, representing high, medium and low. A rational consumer would select the lowest value for price and the highest values/levels for quantity and quality. However, the products offered to respondents required them to 'trade-off' among the three product attributes so that they were always paying a higher 'real' price, but it could be via a higher absolute price, reduced pack quantity, or reduced product quality.

Choice-based conjoint analysis

Choice-based conjoint analysis was conducted for our three FMCG products. Choice-based conjoint analysis is a form of choice experiment that uses multi-attribute product profiles (composed of price, quantity and quality) as stimuli (Raghavaram, Wiley, & Chitturi, 2010). Compared to methods that use rankings or ratings of product alternatives as dependent variables, choice better resembles the real purchasing decision in a retail context (Sichtmann, Wilken, & Diamantopoulos, 2011).

By varying the product attributes that are shown to respondents, and observing the responses to product profiles, it can be statistically deduced what product features are most desired and which attributes have the most impact on choice (Shtudiner, Zwilling, & Kantor, 2017). Sichtmann and Stingel (2007) concluded that willingness to pay estimates based on conjoint analysis may be influenced by consumer characteristics. In this study, we analyse two consumer characteristics that are most likely to influence respondents' choices: consumer income and size of household.

Data collection and sample

The data for this research were collected through an online survey administered by Conjoint.ly, a professional survey company that specialises in conjoint analysis. This company has vast experience with online conjoint analysis surveys and its clients have included Fortune 1,000 companies (the largest American companies, ranked by revenue). The respondents were consumers of FMCG products who live in the United States (US). Each respondent was asked to perform fourteen conjoint tasks for two of our three FMCG products. Respondents were

presented with two products and were asked to provide answers only for the products that they actually bought and were familiar with. We obtained a total of 1,239 product evaluations.

Fourteen choice tasks (more than 50% of the full 27 cell factorial design) is considerably more than is used in other studies, which often estimate results with only 20% of the full design. However, increasing the number of choices per respondent has two, often neglected, benefits. First, while most survey designs stress brevity to avoid tiring respondents, Johnson and Orme (1996) found that later choices better represent the individual's true preferences, as the respondents learn to make consistent choices. Second, additional choices improve the accuracy of hierarchical Bayesian estimates. As an example, one can expect to lose 10% of variance when reducing choices to one half. Reducing choices to one quarter of the full design can be expected to lose another 20% (Johnson & Orme, 1996). Moreover, as later choices only take a few seconds each, the fatigue from these additional choices is minimal.

While there are varying opinions as to the required sample size for a choice-based conjoint experiment, Lancsar and Louviere (2008) suggested that the sample size (choices) can be less than 20 per experimental cell. This study's 27 cell design (3x3x3) implies a minimum sample of 540, divided by 14 choices per subject, divided by the 5 choices per task, so that the minimum sample size is only 8. While this may be sufficient to calculate stable coefficients, it is insufficient to generalise to a large population. Johnson and Orme (1996) suggest that the standard calculations for sample size using proportions can be applied to this task. Using a sample of 400 respondents, with 14 choices per individual, and five alternatives per task, indicates an expected standard error of 3%, with 95% confidence for a 27 cell design. As survey participants are famously averse to giving their exact income, the decision was made to use five categories that divide the respondents into equally-sized household income percentiles. The education categories used were high-school incomplete, high-school complete, some college (e.g. associate degree), bachelor's degree and graduate degree.

The acquired sample does not perfectly match demographics for the US population due to the self-selection bias (potential respondents could decide whether to participate or not for each category), but does include sufficient heterogeneity to test the research hypotheses. As income was a key variable and income categories could be defined as one wished, income groups were defined so that each would contain approximately 20% of the US adult working population. As may be seen in Tables 1a-c, the actual income proportions were close to 20% each, with an underweighting of the top two income categories and a slight overweighting of the two lowest categories. <H.S. and <B.S. represent 'High school incomplete' and 'Bachelor's degree not achieved'.

Sample size and composition vary slightly across product category, due to the combination of the self-selection bias and offering each subject two product categories to evaluate.

Table 1a. Sample profile for strawberry jam.

Members	Household size		Education			Income		
	Number	%	Level	Number	%	Group	Number	%
1	75	18.7%	<H.S.	18	4.5%	<\$22.5k	88	21.9%
2	115	28.6%	H.S.	86	21.4%	<\$45k	101	25.1%
3	96	23.9%	<B.S.	154	38.3%	<\$75k	80	19.9%
4	79	19.7%	B.S.	102	25.4%	<\$120k	81	20.1%
5	22	5.5%	Grad.	42	10.4%	>\$120k	52	12.9%
>5	15	3.7%						

Table 1b. Sample profile for electric light bulbs.

Members	Household size		Education			Income		
	Number	%	Level	Number	%	Group	Number	%
1	81	20.2%	<H.S.	15	3.7%	<\$22.5k	92	22.9%
2	114	28.4%	H.S.	72	18.0%	<\$45k	96	23.9%
3	85	21.2%	<B.S.	162	40.4%	<\$75k	86	21.4%
4	73	18.2%	B.S.	98	24.4%	<\$120k	76	19.0%
5	34	8.5%	Grad.	54	13.5%	>\$120k	51	12.7%
>5	14	3.5%						

Table 1c. Sample profile for boxed chocolate confectionery.

Members	Household size		Education			Income		
	Number	%	Level	Number	%	Group	Number	%
1	82	18.8%	<H.S.	19	4.9%	<\$22.5k	85	19.5%
2	133	30.5%	H.S.	79	18.1%	<\$45k	109	25.0%
3	97	22.2%	<B.S.	152	34.9%	<\$75k	82	18.8%
4	79	18.1%	B.S.	112	25.7%	<\$120k	92	21.1%
5	32	7.3%	Grad.	74	17.0%	>\$120k	68	15.6%
>5	13	3.0%						

Data analysis

While realistic, the choice data obtained provides relatively little information per individual, so that choice-based conjoint analysis can only reliably calculate utilities for a class of respondents (Agarwal, Desarbo, & Malhotra, 2015). Thus, hierarchical Bayesian analysis is an excellent complement for choice-based conjoint analysis, because it permits reliable estimation of utilities at the respondent level from relatively few choices (Orme, 2000).

The choice data were analysed with multinomial logit to produce coefficient estimates for each level of each attribute for each respondent. These coefficients were used to perform the hypotheses tests. Reliability ranged from 54% to 58% across categories, which is classified as 'excellent' using McFadden's pseudo R^2 , a test of reliability for multinomial logit analogous to R^2 in regression analysis (McFadden, 1974, p. 306). This is better than expected from a modelling of categories in which loyalty is relatively weak, and in which considerable mental mathematics is required (e.g. trading off hours of bulb life versus additional bulbs).

Results

Preliminary findings

Before testing the hypotheses, the respondents' general trade-off preferences for price, quantity and quality were considered. Table 2 indicates the *average importance* of each product attribute, while Figure 1 shows the product attribute that was chosen as *most important* by the sample respondents for each product. In both cases, quality is the product attribute most favoured by the respondents for each of the three products, regardless of how quality was operationalised. Whether quality means longer-lasting bulbs, the favoured percentage of cacao in chocolate, or more fruit in jam, fewer customers were willing to trade off quality than either lower prices or greater quantities.

In the real world, the question that marketing managers must ask is not, "which attribute is most important to consumers?" but "which attribute is *least* important to consumers?", as this is the attribute that must be adjusted to offset increased costs. Table 3 analyses consumer utility for higher and lower levels of price, quality and quantity. It appears that, while the worst tactic for responding to higher costs is common to all categories, the best tactic for responding to increased costs varies across categories.

Table 2. The average importance to respondents of product attributes for different products.

		Price importance	Quantity importance	Quality importance
Strawberry jam (n = 402)	Mean	22.6	29.0	48.4
	Std. Dev.	17.3	14.3	18.2
Electric light bulbs (n = 401)	Mean	33.9	23.2	42.8
	Std. Dev.	15.4	9.8	16.9
Boxed chocolate (n = 436)	Mean	29.3	20.8	49.8
	Std. Dev.	18.5	12.2	21.7

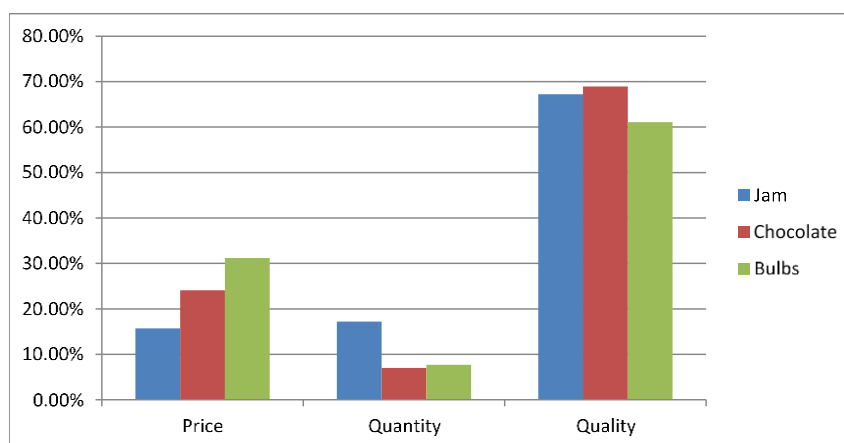


Figure 1. Percentages of respondents for whom the attribute was most important.

Table 3. Changes in average utility in response to changes in a product attribute.

	Higher Price (Unfav.)	Lower Price (Fav.)	Lower Quantity (Unfav.)	Higher Quantity (Fav.)	Lower Quality (Unfav.)	Higher Quality (Fav.)
Strawberry jam	-7.91	7.94	-13.56	11.20	-15.55	28.58
Electric light bulbs	-14.38	13.11	-7.46	11.81	-23.88	21.09
Boxed chocolate	-9.92	12.57	-5.60	12.00	-7.10	-4.29
Overall	-5.46	11.21	-8.87	11.67	-15.51	15.13

For light bulbs and boxed chocolates, the best option is probably to lower the quantity, as this is much less noticeable (-7.46 and -5.60 utility), than either raising price (-14.38 and -9.92) or reducing quality (a spectacular -23.88 and -7.10). However, with jam, consumers are much more sensitive to quantity reductions. The optimal tactic for jam seems to be to raise price (-7.91). Thus, although reports in the popular press indicate that shrinkage is a favourite tactic of FMCG firms, this response will not be favoured by consumers in all product categories.

Hypothesis testing

Finding support for the hypotheses depends upon subjective definitions regarding the independent variables. Using the second hypothesis as an example (Consumer income is negatively related to consumer sensitivity to price), no linear relationship was found between

price sensitivity and income. However, respondents earning more than \$75,000 were significantly less price sensitive than those earning less than \$75,000, so the hypothesis is supported, but only if the dividing line for wealth is set at \$75,000. Logically, it makes sense when considering inexpensive products in a wealthy country that there should be a 'tipping point' at which a price change becomes significant to relatively wealthier people, and that the 'tipping point' should vary from category to category. Even though the 'tipping point' must be found empirically, this phenomenon makes hypothesis testing somewhat subjective.

H1 proposed that absolute price is positively related to consumer sensitivity to price. Referring to Table 4, a difference of the means test for the average importance of price for the two high-priced categories (chocolates and bulbs) (31.5) and importance of price for the low priced category (jam) (22.6) produces a highly significant score ($t = 8.58, p < .001, df = 1,237$). Therefore, H1 is supported.

Table 4. Respondents' trade-off preferences for different FMCG products.

		Price importance	Quantity importance	Quality importance
Boxed chocolate ($n = 436$) Mean price = \$18.95	Mean	29.3	20.8	49.8
	Std. Dev.	18.5	12.2	21.7
Electric lightbulbs ($n = 401$) Mean price = \$16.75	Mean	33.9	23.2	42.8
	Std. Dev.	15.4	9.8	16.9
Average high-priced products	Mean	31.5	21.9	46.4
	Std. Dev.	17.0	11.1	19.4
Strawberry jam ($n = 402$) Mean price = \$3.69	Mean	22.6	29.0	48.4
	Std. Dev.	17.3	14.3	18.2

H2 proposed that consumer income is negatively related to consumer sensitivity to price. As shown in Table 5, respondents earning more than \$75,000 per year are significantly less price sensitive (an average importance of 23.5) than those earning lesser amounts (an average importance of 26.8). The difference of the means (3.3) is highly significant. However, as mentioned above, this relationship was not linear. Moreover, although price sensitivity did vary with income in all categories, the income level that produced different price utilities varied across categories. Thus, H2 is supported, although the relationship is not linear and each category produced differing results.

Table 5. Test of the difference of the mean importance of price by income category.

		Price importance	Difference of means	t-score
<\$75,000 ($n = 819$)	Mean	26.8	3.3	3.36
	Std. Dev.	16.5		
\$75,000 and higher ($n = 420$)	Mean	23.5		
	Std. Dev.	16.1		

95% C.I. = 5.23 to 1.37, $p < 0.01$

H3 posited that the size of the household is positively related to consumer price sensitivity. However, Table 6 reveals no relationship between household size and price sensitivity. Therefore, the data does not support H3.

Table 6. Importance of price by household size.

Household size	Strawberry jam			Electric light bulbs			Boxed chocolate		
	<i>n</i>	Mean	Std. Dev.	<i>n</i>	Mean	Std. Dev.	<i>n</i>	Mean	Std. Dev.
One	75	24.60	18.15	81	35.58	15.44	82	31.24	18.10
Two	115	19.86	15.18	114	32.45	15.33	133	29.47	19.43
Three	96	24.82	18.16	85	34.95	16.11	97	25.55	16.84
Four	79	20.77	16.77	73	33.49	16.28	68	30.27	19.82
Five	22	24.29	20.51	33	34.49	12.84	43	26.07	19.02
More than Five	15	26.10	17.21	15	31.31	12.38	13	23.25	16.78
Total	402			401			436		
Average		23.40	17.66		33.71	14.73		27.64	18.33

H4 proposed that the size of the household would be positively related to consumer sensitivity to quantity. This was initially tested with a simple regression analysis, using a dummy variable for 'households greater than one'. For single member versus multiple member households, the results, shown in Table 7, are significant, which supports H4. However, once households pass two members, increasing household size does not increase the importance of quantity. So, overall, we conclude partial support for H4. Again, rather than a linear relationship, we find a 'tipping point' beyond which further increases in household size have no effect.

Table 7. Importance of quantity by household size.

	Simple univariate regressions						
	Constant	Beta Household >1	Std. Error	<i>d.f.</i>	<i>t</i> -score	<i>R</i> ²	Sig.
All categories	38.1	3.32	1.44	1,237	2.30	0.04	0.02

H5 posited that consumer income is positively related to consumer sensitivity to quality. As may be seen in Table 8, no linear relationships exist between income and sensitivity to quality across product categories. However, within each product, income was positively and significantly related to the importance of quality. The main difficulty with the cross-category hypothesis test is the differing points at which income became a significant predictor of sensitivity to quality. For light bulbs, people became more sensitive to quality at the second lowest income category (less than \$45,000); for chocolate, the income level at which sensitivity to quality increased was \$75,000; while for the cheapest product, strawberry jam, only the wealthiest (those earning more than \$120,000 per year) were more sensitive to quality than those with lesser incomes. It is concluded, therefore, that H5 is partly supported, but the relationships are non-linear and category-specific.

Table 9 presents a summary of the results of the hypothesis tests.

Table 8. Simple univariate regressions between income and the importance of quality.

	Beta			Std. Error	<i>d.f.</i>	<i>t</i> -score	Adj. <i>R</i> ²	Sig.
	Constant	>\$45k	>\$75k					
Light bulbs	41.53	4.10		1.81	399	2.28	0.01	.023
Chocolate	48.27		4.23	2.15	434	1.97	0.07	.049
Jam	47.45			2.68	401	2.83	0.02	.005

Table 9. Summary of hypothesis test results.

Hypothesis	Result
H1 Absolute price is positively related to consumer sensitivity to price	Supported
H2 Consumer income is negatively related to consumer sensitivity to price	Supported
H3 Household size is positively related to consumer sensitivity to price	Not Supported
H4 Household size is positively related to consumer sensitivity to quantity	Partly Supported
H5 Consumer income is positively related to consumer sensitivity to quality	Partly Supported

Discussion

The main purpose of this research was to ascertain consumer preferences for the different options that manufacturers have for reacting to increased costs: increasing price, reducing quantity, or reducing quality. Based on an extensive review of the literature, predictions were made as to which demographic and category traits would determine consumer preferences. A solid conjoint-based methodology was developed for three carefully-chosen product categories. Consumer trade-off preferences among price, quantity and quality were analysed for three different FMCG products. Realism was maintained by varying product characteristics within existing ranges, and using large well-designed samples obtained from a professional survey company that specialises in conjoint analysis.

For each of the three product categories tested, quality is the product attribute which consumers are least willing to sacrifice, whether measured by average importance (Table 2) or most important product attribute (Figure 1). It is interesting that even low income consumers are not prepared to sacrifice product quality when they make purchase decisions. Consistent with this finding, the largest low cost/discount supermarkets, such as Walmart, Aldi and Lidl, emphasise to consumers that their private-label products are not inferior to the more upscale supermarket chains – and, in some cases, that their products are even superior – and thus many consumers perceive that the discount chains offer the best value for money (The Telegraph, 2018).

It should be recognised that perceived quality is not the same as actual quality. If a manufacturer can use a cheaper substitute ingredient/material or use slightly less of an expensive input without consumers noticing, the firm may be able to preserve, or even increase, its gross margin. Sometimes, a firm can relaunch a product, claiming that it is improved, for example because it is healthier, while at the same time reformulating the product to make it cheaper to produce. Branding and marketing communications that emphasise quality may play an important role in reassuring or persuading consumers about a product's quality.

A key problem for marketers is that perceived quality is a highly individual judgement that may be influenced by a range of factors – such as a product's appearance, design, flavour, reliability and durability – and that each of these factors will have a different weighting for different individuals. Our results suggest that an individual with a higher income is more likely to judge an expensive high quality product as offering good value than an individual with a lower income, but the point at which income becomes related to quality importance varies across product categories (Hypothesis 5).

Measured by both average importance (Table 2) and most important product attribute (Figure 1), price is the respondents' second most important product attribute for the two most expensive categories (boxed chocolate confectionery and electric light bulbs), but quantity was more important than price for the cheapest category (jam). This contrasts strongly with other studies in which price is generally the product attribute most noticed by consumers when shopping for FMCG products. For example, Çakir & Balagtas (2014) found that consumers are approximately four times as sensitive to changes in price as they are to changes in pack quantity.

Our findings suggest that consumers are more sensitive to price when the absolute price is higher (H1). Thus, if two firms make the same percentage price increase, the manufacturer of a cheaper 'impulse buy' product may experience a smaller decline in sales compared to the manufacturer of a more expensive household item. Also, the higher an individual's income, the less likely they are to be sensitive to price increases (H2), particularly if they are satisfied with the product's quality and utility.

For electric light bulbs and boxed chocolate confectionery, pack quantity was the product attribute that was rated least important by our respondents. Interestingly, for strawberry jam, price was the least important attribute. This is undoubtedly due to the fact that the jam is by far the cheapest of our three products (mean price of \$3.69, compared to \$16.75 for the light bulbs and \$18.95 for the boxed chocolate). In practice, consumers tend not to notice package downsizing when shopping in a supermarket, because they do not read the content information on packaging, and they use visual estimations of pack size as a proxy for pack quantity (Wilkins et al., 2016). Furthermore, consumers tend not to understand different measurement systems; are unaware of unit price indicators provided by supermarkets; often feel overloaded with product information; are unwilling to make the effort to make product comparisons; or simply do not care about small quantity differences (Lennard et al., 2001).

Even though this survey drew respondents' attention to the product attribute of quantity, it was still rated far less important than product quality for all three product categories, and less important than price for two of the three product categories. We assumed that larger households buy FMCG products in larger quantities – which may often include multipack purchases – and hypothesised that consumers shopping for larger households would be more sensitive to quantity decreases. Our results for H4 suggest that a significant difference does exist between single and multiple member households and sensitivity to pack quantity. However, it is likely that as household income increases, household size will have less effect on sensitivity to quantity changes.

Conclusion

This research fills a gap in the literature on firms' marketing mix decisions that involve product price, quantity and quality trade-offs, particularly as few previous studies have focused on product downsizing. Indeed, in the context of margin management, this is, to our knowledge, the first study to examine consumers' preferences related to the trade-off between product price, pack quantity and product quality. Furthermore, previous studies have examined single products (e.g. Çakir & Balagtas, 2014; Krystallis & Ness, 2005), whereas this study included multiple product comparisons. Because purchase intentions expressed in consumer research have been found to be strong predictors of actual purchasing behaviour (Homburg et al., 2005), this research provides valuable insights into consumer trade-off preferences, which may help firms make the optimal marketing mix decisions.

FMCG manufacturers have increasingly resorted to package downsizing as a means to cope with cost increases and to maintain profit margins (Wilkins et al., 2016). In general, the findings of this study suggest that manufacturers may have a better chance of maximising profit by reducing pack quantity rather than increasing price or lowering quality. This is a useful

contribution; however, there were others. We found two intuitively-correct predictors of price sensitivity: consumer income and product price. Combining these two findings provides contextualised advice for manufacturers: if your customers are wealthy and your products inexpensive, the most attractive trade-off for customers will be price. On the other hand, if your customers are relatively poor and your product expensive, consumers will be very sensitive to price, so that reducing quantity becomes the preferred choice.

The results of this study indicate that firms cannot assume that generalisations may be made about consumers' trade-off preferences, as consumers' preferences vary for different products, and they may vary over time in response to changes in their lives, e.g. income, family size, or the desire to eat more healthily. Furthermore, in fast-changing FMCG markets, new brands and varieties may appear regularly, and this may influence consumers' decision-making. Thus, it is essential that firms conduct market research each time they want to ascertain the consumer trade-off preferences for a specific product. In order to make the optimal marketing mix decisions, firms need to identify the criteria used by consumers to determine perceived value for a particular product. Furthermore, firms should consider the demographic profiles of their target customers, using categorisations such as income and household size.

The study is not without limitations. Although the results of the hypothesis tests are generally significant and consistent with the literature, they are also fairly weak. This is probably a result of studying relatively inexpensive convenience goods in a wealthy country, in which most consumers are willing to sacrifice quantity or price in order to obtain the desired product quality. We accept that response bias is possible in studies such as this, e.g., respondents may not want to be seen as accepting lower quality products, while their actual buying behaviour may be different. However, given that the research was concerned with relatively low-priced FMCG products, such response bias is unlikely to have been a problem. It should also be noted that finding a suitable quality indicator for each product category was fairly difficult and somewhat subjective.

Future research could use different product categories, including white goods and services, and be conducted in different countries. As well as further exploring the influences of consumer income and household size, additional demographic features of consumers may be considered, such as gender, age and education level. Also, it may be interesting to see whether consumer trade-off preferences vary among branded versus unbranded products (see e.g. Gázquez-Abad & Martínez-López, 2016).

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