# EXPLORATION OF BRAND EQUITY MEASURES:

# LINKING CUSTOMER MIND-SET MEASURE TO PRODUCT-MARKET PERFORMANCE MEASURE

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## ABSTRACT

Explorations of Brand Equity Measures:

Linking Customer Mind-Set Measure to Product-Market Performance Measure

By

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2008

Committee Chair: Prof. Emine Sarigollu

Major Area: Marketing

**Motivation:** Various brand equity measures have been proposed in extant literature. Few researches have explored the theoretical similarities, differences and relationship between different brand equity measures. In the thesis, I will explore two types of brand equity measures, namely customer mind-set measures and product-market performance measures. In particular, I will look at: 1) the correlation between the two types of measures; 2) which measure reflects the underlying brand equity construct better; 3) the impacts of marketing mix elements on the two types measures respectively; and 4) the prediction relationship between customer mind-set measure and product-market performance measure.

**Theoretical Framework:** My main theoretical framework will be brand equity literature. I draw upon the Brand Value Chain framework (Keller & Lehmann, 2003) to explore the conceptual differences between two types of brand equity measurements, namely customer mind-set and product-market performance measurements. Furthermore, I also

use Keller's (1993) Customer-Based Brand Equity concept to explore how specific marketing activities impact the brand equity theoretically.

**Data and Methodology:** This thesis measures brand equity by two methods: customer mind-set (Keller, 1993) and revenue premium (Ailawadi, Lehmann, & Neslin, 2003). I use two types of data in the empirical analyses. Survey data, procured from a consumer-packaged product company[1], is used to measure customer mind-set brand equity. This unique data consists of proprietary equity scan surveys on 11 brands from 2004 – 2006 in the United States. The measurement model of brand equity is rooted in Keller's customer-based brand equity concept (1993). The measurements include brand awareness, brand performance, brand image, brand judgment, brand feelings and brand resonance (Keller, 2001). The second data is from commercial sources, including IRI and TNS, for the specific brands and time periods corresponding to the survey data and includes revenue premium, price, sales, distribution, promotion, and advertising information. Various techniques are employed for analyses including descriptive and reliability analyses, correlation analyses, multiple-regression, and cross-validation.

**Contribution:** The contribution of this thesis is threefold. Firstly, it sheds light on the underlying theory and relationship between two types of brand equity measurements and provides empirical test of the theory. Secondly, it provides a systematic exploration of the impact of marketing mix elements on brand equity using real market data and two different measurements. Third, it offers very practical guidance for managers on how to

[1] Because a confidential agreement with this company, the company name, brands name as well as product category will be disguised in the thesis.

choose a specific brand equity measures and how to track the brand equity measures over time for their brands.

## RÉSUMÉ

Explorations des mesures de capitaux propres de marque :

corrélation entre la mesure de la mentalité du client et la mesure de la performance du produit-marché

Par

Rong Huang

2008

Responsable du comité : Prof. Emine Sarigollu

Secteur principal : Vente

**Motivation :** Diverses mesures de capitaux propres de marque on été proposées dans la littérature existante. Il y a peu de chercheurs qui ont explorés les similitudes, les différences et le rapport entre différentes mesures de capitaux propres de marque. Dans cette thèse, je vais explorer deux types de mesures de capitaux propres de marque, c'est-à-dire la mesure de la mentalité du client et la mesure de performance du produit-marché. En particulier, j'examinerai : 1) la corrélation entre les deux types de mesures ; 2) quelle mesure reflète l'amélioration de la construction de capitaux propres de marque; 3) les impacts des éléments mélangés du marketing sur respectivement les deux types mesures et 4) le rapport des prévisions entre la mesure de mentalité du client et la mesure de performance du produit-marché.

**Cadre théorique :** Mon cadre théorique sera basé sur la littérature de capitaux propres de marque. J'utilise le cadre de Brand Value Chain (Keller et Lehmann, 2003) pour explorer

les différences conceptuelles entre deux types de mesures de capitaux propres de marque, à savoir la mentalité de client et les mesures de performance du produit-marché. De plus, j'emploie également Keller (1993) le concept de Customer-Based Brand Equity afin explorer comment de manière spécifique les activités de vente influencent théoriquement les capitaux propres de marque.

**Données et méthodologie :** Cette thèse mesure les capitaux propres de marque par deux méthodes : la mentalité de client (Keller, 1993) et la prime de revenu (Ailawadi, Lehmann, et Neslin, 2003). J'emploie deux types de données dans les analyses empiriques. Les donnés de sondage, un produit tout en un obtenue d'une compagnie, son employées pour mesurer des capitaux propres de marque de la mentalité du client. Ces données uniques se composent des enquêtes de balayage de capitaux propres de propriété industrielle sur 11 marques de 2004 - 2006 aux États-Unis. Le modèle de mesure des capitaux propres de marque est enraciné dans le concept client-basé de capitaux propres de marque de Keller (1993). Les mesures incluent la conscience de l'existence de la marque, la performance de la marque, l'image de la marque, le jugement basé du la marque, les sentiments et résonnances reliés à la marque (Keller, 2001). Les deuxièmes données sont de sources commerciales, y compris IRI et TNS, pour les marques spécifiques et la période de temps correspondant aux donnés du sondage et incluant les primes de revenue, le prix, les ventes, la distribution, la promotion, et l'information de publicité. Diverses techniques sont utilisées pour les analyses comprenant des analyses

descriptives et de fiabilités, des analyses de corrélation, la multiple-régression, et la inter-vérification.

**Contribution :** La contribution de cette thèse est triple. Premièrement, elle clarifie la théorie et le rapport entre deux types de mesures de capitaux propres de marque et fournit des testes empiriques de la théorie. Deuxièmement, elle fournit une exploration systématique de l'impact des éléments mix de marketing sur les capitaux propres de marque en utilisant de vraies données du marché et deux mesures différentes. Troisièmement, elle offre des conseils très pratiques pour des gestionnaires sur la façon de choisir des mesures de capitaux propres de marque et la façon de suivre les mesures de capitaux propres de marque de manière ponctuelle pour leurs marques.

# CHAPTER 1: INTRODUCTION

Brand equity has been recognized as an important concept in marketing since the 1980s. Brand equity refers to the "added value" of the focal brand to a product. It not only indicates the brand's value in customers' minds, but also suggests the company's strength compared to its competitors. A variety of brand equity concepts and measures have been proposed and implemented. Yet no systematic research is reported on different measures of brand equity. Few studies have partially explored this area. For instance, only Silverman, Sprott and Pascal (1999) have examined the relationship between brand awareness and product market outcome, and they have found a weak relationship between the two measures. Many questions remain unanswered in the extant literature. For instance, what are the differences between customer mind-set and product-market performance measures of brand equity? Do marketing activities impact the different measures in the same way? Can one test and demonstrate the conventional notion that customer mind-set measures provide better diagnostic information to managers than product-market performance measures? Understanding the difference and relationship between different brand equity measures is important to managers who are interested in assessing and tracking their brand's equity. Provided with various options to measure brand equity, managers need a thorough understanding of the different measures in order to make informed choices. It would be helpful for them to know why discrepancies, if any, occur in the information provided by these different measures.

My thesis focuses on two types of brand equity measures, namely customer mind-set measures and product-market performance measures. I use overall rating of brand knowledge as customer mind-set measure and revenue premium as the product-market performance measure. I discuss conceptual similarities and differences between the two types of measures. Essentially, both measures are supposed to measure brand equity. Hence, it is expected that marketing activity affect customer mind-set and revenue premium measures similarly. However, conceptual differences signal that consumer mind-set would capture more cumulative brand-building efforts than revenue premium. This research investigates the two types of measures empirically. I also explore the predictive relationship between the customer mind-set measure and the product-market performance measure. Interestingly, I found that, contrary to the "marketing investment → customer mind-set → product performance" sequence proposed in the Brand Value Chain (Kevin & Lehmann, 2003), revenue premium is a precedent of customer mind-set for low involvement frequently purchased consumer packaged goods, the product category in our dataset.

In addition to the overall brand equity measures, brand awareness is also incorporated in the analysis because it is the prerequisite to building brand equity. And the influence of marketing mix elements on brand awareness is explored to gauge its relevance for managers and academics alike. Finally, the relationship between brand awareness and revenue premium is examined.

This study offers both academic and practical contributions. First, it provides the first systematic investigation of different brand equity measures, namely the customer mind-set and product performance measures. It also conducts the first empirical test of the Brand Value Chain proposed by Keller and Lehmann (2003). Essentially, the thesis finds that both measures assess brand equity, but at different value stages of the Brand Value Chain.

The thesis also investigates the relationship between the customer mind-set and revenue premium (i.e. product-market performance) and finds that revenue premium is a precedent of customer mind-set for low-involvement, frequently purchased consumer packaged goods. This finding provides practical implications to both academics and managers. Specifically, the findings enrich the conceptual understanding of how to build brand equity. It is demonstrated that for low-involvement, frequently purchased consumer packaged goods, brand equity is mainly built through consumers' brand usage experience. Contrary to Brand Value Chain, building of brand equity might not follow the sequence of "marketing investment →brand affect → purchase behavior" for certain product categories. This sequence however might be more appropriate for managers to track the changes of brand equity for new products, or new product categories.

The thesis for the first time provides insights into the choice of brand equity measures. Specifically, the revenue premium is a good choice for managers to track brand equity because a) it is a practical and convenient measure since its data requirements are readily available; b) it reveals the "true" changes in brand equity; and c) it flags any problem in

brands earlier than the customer mind-set measure would. If the revenue premium signals problems with the brand, managers are advised to use the customer mind-set measure to verify the exact nature of the problem.

The thesis provides further evidence for the importance of product usage experience in building brand awareness and enhancing brand equity through the assessment of feedback effects of product-market performance measures on customer mind-set. The sheer presence of the brand on the shelf could generate product trial for consumers, which in turn could create brand experience and contribute to brand knowledge in customers' minds. Hence, it is recommended that managers increase the distribution intensity of the low-involvement, frequently purchased consumer packaged goods. Advertising is important to frame or to reinforce the product usage experience.

The thesis for the first time adopts a "systems view" to explore the impact of multiple marketing mix variables (specifically, advertising, pricing, distribution and price promotion) on brand equity. This is in keeping with Shocker, Srivastava and Reukert (1994) who suggested that it is important to develop a "systems view" of how brand equity is created by various marketing activities. Only Yoo, Donthu and Lee (2000) have investigated the effects of multiple marketing variables (i.e., advertising, price deals, store image, price, and distribution image) on brand equity to date. However, the study of Yoo et al. (2000) is based on survey data, whereas the current study uses real market data, hence has the potential to provide inferences for marketing practitioners about the impact of marketing elements in building brand equity. Particularly valuable will be the

information on the impact of price promotion on two types of brand equity measures. For consumer packaged goods, price promotion has been widely implemented by marketing managers (Blattberg, Briesch, & Fox, 1995) to generate sales. However, price promotion is also criticized as it might jeopardize brand equity. The current study provides an empirical study of the impact of price promotion on brand equity and finds negative associations between them. Thus, managers are advised to use price promotion with caution.

To the best of my knowledge, this is the first time the conceptually well-accepted customer mind-set brand equity measures are operationalized on real customer data and linked with real marketing mix data. Finally, this research offers improved robustness in assessing the impact of marketing activity on brand equity by considering for the first time both measures of brand equity, namely customer mind-set and product-performance, as dependent variables.

This thesis is structured as follows. First, I present a review of relevant literature to establish the theory background regarding the relationship between customer mind-set and product-performance measures. Based on the literature review, research hypotheses are proposed (Chapter 2). Then, I present the research methodology and operationalization of variables (Chapter 3). This is followed by presentation of descriptive statistics on the variables used in subsequent empirical analysis (Chapter 4). Then, Chapter 5 will present the results of hypotheses test. The academic and managerial implications of the results are discussed in Chapter 6. Finally, Chapter 7 concludes the

thesis with the contributions and limitations of the research. Future research directions are also discussed in Chapter 7.

# CHAPTER 2: LITERATURE REVIEW

I first review brand equity concepts. Then, I examine the extant brand equity measures, as well as the relationship between customer mind-set and product-market performance measures. In particular, I first explore the relationship between customer mind-set measures and product-market performance measures. Then, I investigate the relationship between different marketing mix elements and varying brand equity measures. Finally, the prediction relationship between the customer mind-set measure and product-market performance measure is discussed.

## 2.1 Brand Equity Conceptualization

### *2.1.1 Conceptualization*

Brand equity emerged in the 1980s. Since then, a variety of brand equity concepts have been proposed as follows:

1) Brand equity is the incremental cash flows which accrue to branded products over unbranded products (Farquhar, 1989; Simon & Sullivan, 1993, p. 2).
2) Brand equity is a set of brand assets and liabilities linked to a brand, its name and symbol, which add to or subtract from the value provided by a product or service to a firm and/or to that firm's customers (Aaker, 1991, p. 15).
3) From a firm's perspective (emphasizing asset management), brand equity is incremental cash flows resulting from the product with the brand name versus those that would result without the brand name (Shocker & Weitz, 1988). Brand equity is the "added value" with which a brand endows a product; this added

value can be viewed from the perspective of the firm, the trade, or the customers (Farquhar, 1989).

4) Brand equity deals with the value, usually defined in economic terms, of a brand beyond the physical assets associated with its manufacturer or provision (Biel, 1992).
5) The concept of brand equity refers to the basic idea that a product's value to its customers, the trade and the firm is somehow enhanced when it is associated to, or identified over time with, a set of unique elements that define the brand concept (Erdem & Swait, 1998).
6) Customer-based brand equity is defined as the differential effect of brand knowledge on customer response to the marketing of the brand (Keller, 1993).

From the various definitions provided above, two major differences are observed. Firstly, brand equity has been conceptualized from different perspectives, namely, the customer's perspective (e.g., Ederm & Swait, 1998; Keller, 1993) and the firm's perspective (e.g., Farquhar, 1989; Biel, 1992). Secondly, brand equity has been conceptualized using different "methods", namely, psychology-based approaches (e.g., Keller, 1993) or economic-based approaches (e.g., Erdem & Swait, 1998). In the following sections, the different perspectives of brand equity concepts and conceptualization approaches will be discussed. Then, a framework is explored in order to integrate different perspectives of brand equity concepts.

### *2.1.2 Two Different Perspectives in Brand Equity Conceptualization*

When reviewing the various brand equity concepts presented above, two different brand equity perspectives are observed, namely, the customer's perspective and the firm's perspective. Essentially, researchers try to explain the benefits of brand equity for customers and firms. For instance, Shocker and Weitz (1988) defined brand equity as a "function of associations in the customers' mind with the brand name", (p. 2). They explained the concept from two different perspectives. From the firm's perspective, brand equity is the incremental cash flow; while from the customer's perspective, brand equity is the utility provided beyond the product or service attributes, or a clear differentiated brand image. Leuthesser (1988) defined "brand equity" as the set of associations and behavior on the part of a brand's customers, channel members, and parent corporations. These "associations and behaviors" permit the brand to earn greater volume or greater margins than it could without the brand. Farquhar (1989) also considered brand valuation from the perspective of firms and customers, and defined brand equity as the "added value with which a given brand endows a product" (p. RC-7). From a firm's perspective, Aaker (1991) defines brand equity as a set of assets/liabilities that are linked to a brand. Such assets or liabilities may add or subtract from the value provided by a product or service to a firm and /or to that firm's customers.

Although researchers have explained different "meanings" of brand equity for different parties, confusion and ambiguity exist in the literature. Firstly, the mixing-up of the "sources" of brand equity with the "results" or "forms" of brand equity is observed. For example, in Shocker and Weitz (1988), brand equity is defined as an easier entry into a

distribution channel, or a bargaining power over the channel members. However, such an attribution actually refers to the "forms" of the advantages brought on by brand equity. Aaker (1991) identified four major brand equity dimensions, namely, brand loyalty, name awareness, perceived quality, and brand associations, in addition to perceived quality. However, among the four dimensions, brand awareness is one of the determinants of brand equity, as it is part of the brand knowledge. However, brand loyalty is one of the results of "brand knowledge". Therefore, confusion seems to exist between "sources" of brand equity and results of brand equity.

Secondly, the definition of brand equity as an "added value" (e.g., Farquhar, 1989) is rather ambiguous. Such a definition does not state explicitly and clearly for whom the added value is important, and in what forms the added value is. Such confusion and ambiguity mainly arise from the difficulties to integrate the different perspectives of "brand equity"; specifically, from 1) a customer's perspective, and 2) a firm's perspective.

A significant development in brand equity occurred when Keller (1993) developed "customer-based brand equity". Keller (1993) defines "customer-based brand equity" as the differential effect that brand knowledge has on customers or customers' response to the marketing of that brand. Therefore, if customers react more favorably to the marketing mix elements of the brand than they do to the same marketing mix elements of a product with a fictitious name, or no name at all, the brand is said to have positive "customer-based brand equity".

The theoretical underpinning of the "brand knowledge" is that the brand serves as a node of an associative network memory which links various types of associations (Aaker, 1991; Keller, 1993). While brand awareness relates to the strength of the node that reflects customers' ability to recognize and recall the brand, brand image (associations) refers to customers' perceptions of the brand, including: attributes, benefits, and attitudes (Keller, 1993). According to Keller (1993), brand image mostly explains why customers have differential responses to marketing mix elements; brand awareness plays an important role in the customer decision-making process. In sum, the recalling and the recognition of the brand, as well as unique and favorable brand associations (image), all play an essential role in determining brand equity. Therefore, the power of a brand is in the minds of customers, and customers' experience and learning of the brand develops over time.

Keller (1993)'s brand equity contributes to the literature from the following perspectives. First, this definition focuses on the "sources" of brand equity from the customer's perspective and focuses on the "core" of brand equity: brand knowledge. Because of differences in brand knowledge in customers' minds, customers react "differently" to marketing mix elements of different brands. Although called "customer-based brand equity", this concept is not necessarily from the customer's perspective; rather, it is from the firm's perspective that states the exact reason (i.e., brand knowledge) for differential responses of customers. Customers make the purchase decision and ultimately determine the "equity" of a brand. Such identification of brand equity sources helps to integrate the perspectives of brand equity conceptualization (the customer's and firm's perspective) into one framework. (I will discuss this integration in later sections.) Furthermore, this

definition is of a good-diagnostic nature, offering practical managerial implications on how to build brand equity.

### *2.1.3 Two Different Approaches in Brand Equity Conceptualization*

The majority school of brand equity concepts is psychology-based (e.g., Aaker, 1991; Keller, 1993). A less popular view of brand equity is economic-based. Based on signaling theory, the "credibility" of a brand is regarded as the primary determinant of brand equity (Erdem & Swait, 1998). In their model, given the imperfect and asymmetrical information structure, customers are uncertain about product attributes or quality. By conveying credible product claims and information on a product's position, brands will decrease the information costs and perceived costs for customers, in turn, increasing customers' expected utility. As such, Erdem and Swait's (1998) conceptualization is from the customer's perspective. This economic-based brand equity concept thus addresses the issue of how brand adds value for customers. Essentially, customers are willing to pay price premiums, or become loyal to a brand because their expected utility is increased.

When comparing economic-based brand equity concepts with psychology-based ones, Erdem and Swait (1998) noted several differences. First, the causal relationship between brand equity, and customer utility were reversed in Aaker (1991). Aaker reasoned that brand equity helps customers to process and interpret information. Hence, customer efficiency and effectiveness of purchase decision-making is a result of brand equity. However, Erdem and Swait (1998) proposed that customers ascribed equity to brand because they could process and interpret information efficiently by the credible brand

signal. Therefore, in Erdem and Swait's (1989) model, it is customer efficiency and effectiveness in making purchase decisions that bring equity to a brand. Furthermore, brand loyalty is regarded as a consequence of brand equity in Erdem and Swait (1998), but as an antecedent in the model of Aaker (1991). In sum, the economic-based brand equity concepts are also from the customer's perspective; however, they utilize theories different from the concepts developed by Aaker (1991) and Keller (1993).

### *2.1.4 Integration of the Two Brand Equity Perspectives*

Brand equity is defined as the "added" value of the brand to the product. The "added value" is defined through two different perspectives, namely, the customer's perspective and the firm's perspective. There is, however, a lack of integration of these different perspectives within the current literature. The following section will present an integrative framework involving two different brand equity perspectives. Essentially, this framework will utilize Keller's brand equity concept to analyze how brand knowledge adds value from the customer's and firm's perspectives (Figure 1).

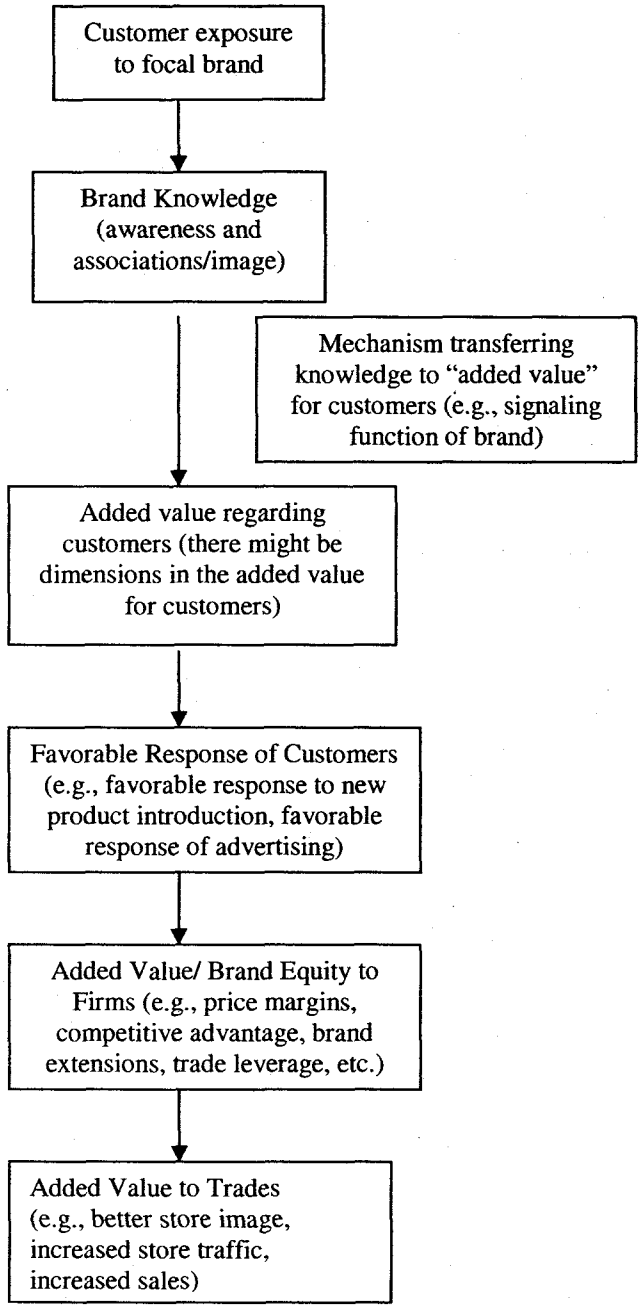
Firstly, the framework identifies factors that shape or influence how brand knowledge is formed in customers' minds. Customer experience with a brand shapes the brand knowledge in their minds. Anything exposing customers to the brand, such as advertising, as well as customer usage experience with the focal brand, will have an impact on the building of brand knowledge. Firms could influence the brand knowledge formation in customers' minds by utilizing marketing mix elements, such as product, distribution, and marketing communications.

Secondly, brand knowledge adds value for customers by helping them make efficient and effective purchase decisions (Aaker, 1991; Erdem & Swait, 1998). Since a brand decreases the information search cost and perceived risk for customers (Campbell, 2002; Erdem & Swait, 1998), the expected utility of purchase increases. Consequently, customers have favorable attitudes toward that brand.

Thirdly, customers' favorable attitudes toward a brand cause the differential responses of customers to the marketing efforts of the brand's manufacturer. The differential responses, in turn, result in customer brand loyalty, customers' willingness to pay price premiums, and comparative price inelasticity. These favorable responses from customers add value to the brand from the company's perspective.

In sum, in this framework, brand equity stems from the brand knowledge formed in customers' minds. Brand equity first adds value for customers, and in turn, adds value for firms. In this way, the two perspectives of brand equity are integrated. Although various brand equity concepts are introduced in extant, few works have tried to develop an integrative framework. In this work, the different perspectives of brand equity are integrated by utilizing customer-based brand equity concepts (Keller, 2003), and hence constitutes a theoretical contribution of the current literature. In addition, this framework identifies the lack of research regarding how brand knowledge is transferred to customers' added value, which I propose as a future research area.

**Figure 1: Framework of Brand Equity Concepualization**



## 2.2 Brand Equity Measures

I next review the extant brand equity measures. Firstly, the Brand Value Chain proposed by Keller and Lehmann (2003) will be presented. Then, I will discuss the three subsets of the brand equity measures, namely, customer mind-set measures, product-market performance measures, and firm level performance measures by utilizing the Brand Value Chain (Keller & Lehmann, 2003). Since the focus of this research is the brand equity measures, I will also discuss which brand equity measures are chosen for this specific research.

### *2.2.1 Brand Value Chain (Keller & Lehmann, 2003)*

Brand Value Chain (Figure 2) developed by Keller and Lehmann (2003) is utilized to demonstrate how brand equity creates value for the company. It also integrates the different brand equity measures into one framework.

The Brand Value Chain starts from the firm's investment in building brand knowledge in the customer's mind. Brand knowledge in customers' minds can be assessed by different measures, such as brand awareness, brand associations, brand attitudes, brand attachment and brand activity. Then, brand knowledge is transferred to brands' market performance which can be gauged by measures such as price premiums, market share or price elasticity. Finally, the Brand Value Chain ends with the improvement in shareholder value of that firm (Keller & Lehmann, 2003). During the process of brand value creation, some other factors may moderate the transformation process. For instance, marketplace conditions such as competitive reaction, channel support and customer size and profile

may moderate the process in which customer mind-set is transferred into market performance. In summary, Brand Value Chain links the sources of brand equity (i.e., brand knowledge) to the results of brand equity during different stages of value creation. It also helps to understand various brand equity measurements.

Essentially, the Brand Value Chain is similar to the integrative framework of brand equity conceptualization discussed in the previous section (Figure 1). Both frameworks try to integrate different brand equity perspectives (namely, customers' perspective and company's perspective) into a single framework. The Brand Equity Framework (Figure 1) proposes that there might be some dimensions in the brand's added value for customers. And, it models the process of how brand knowledge adds value for customers. However, Brand Value Chain (Figure 2) is more from the company's perspective, and concentrates on how the brand knowledge is transferred into different advantages at different stages.

Brand Value Chain will be utilized to discuss the brand equity measures. According to the value chain, brand equity measures could be classified into three subsets: customer mind-set measures, brand performance measures, and measures of shareholder value (Table 1). I will discuss each subset of brand equity measures in detail. Also, the choice of the brand equity measures in this specific research will be discussed and justified.

**Figure 2: The Brand Value Chain (Keller & Lehmann, 2003, p.29)**

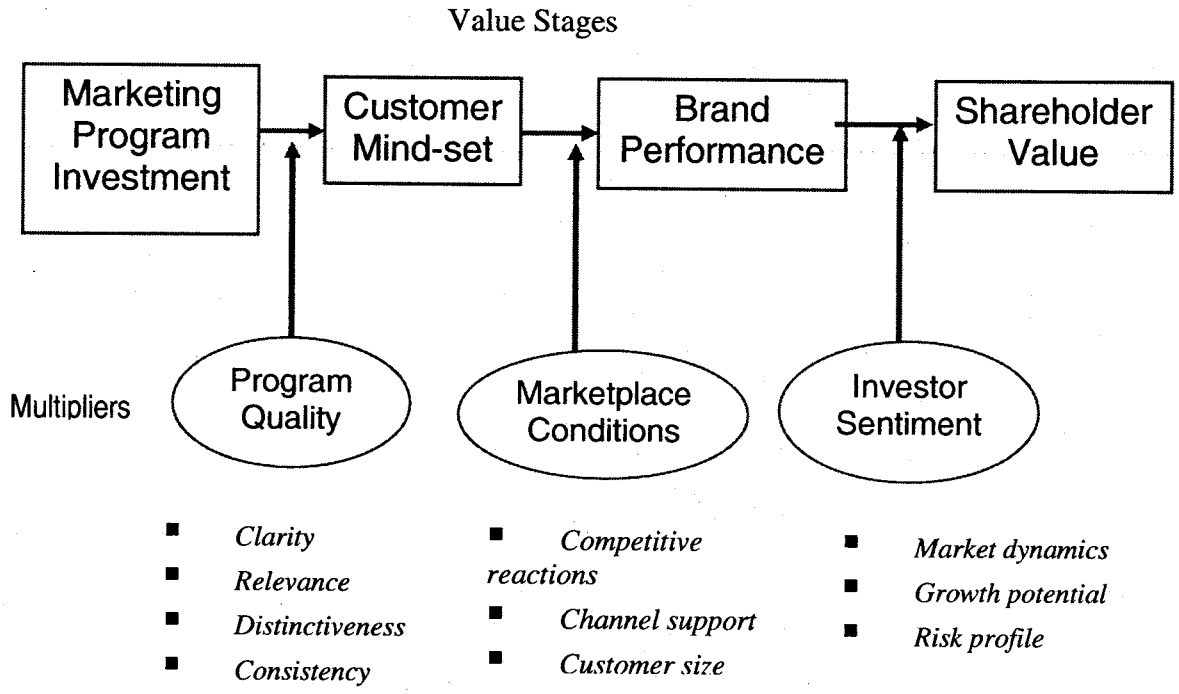


**Table 1: Classification of Brand Equity Measures**

| Consumer Mind-set Measurement | Product-market Performance | Firm Level Performance |
|---|---|---|
| Brand awareness (e.g. Aaker, 1991; Keller, 1993)<br>Brand image (e.g. Keller, 1993)<br>Brand loyalty/attachment (e.g. Aaker, 1991; Yoo and Donthu, 2001)<br>Brand activity (e.g., purchase intent) (e.g. Keller, 2002)<br><br>Overall assessment of customer mind-set (e.g., Lasser, Mittal, and Sharma 1995; Netemeyer, Krishman, Pulling, Wang, Yagci, Dean, Risk & Wirths, 2004; Yoo and Donthu , 2001)<br><br>Additional customer utility (Lourvier & Johnson, 1988)<br><br>Consumer utility intrinsic to brand (Kamakura & Russell, 1993)<br><br>Non-attribute specific value (Park & Srinivasan, 1994) | Market share (Aaker, 1991)<br>Price premium (Bello & Holbrook, 1995; Holbrook, 1992)<br>Revenue premium (Ailawadi et al., 2003)<br>Price elasticity (Mela, Gupta, & Lehmann, 1997)<br>Profitability (Dubin, 1998)<br>Brand Utility Intercept (Sriram, Blachander, & Kalwani, 2007) | Stock price (e.g., Simon and Sullivan , 1993)<br>Value in acquisition<br>Interbrand Brand Valuation<br>Young & Rubicam's Brand Asset Valuator |

### *2.2.2 Customer Mind-set Measure*

Customer mind-set measures include five dimensions, namely, brand awareness, brand associations, brand attitude, brand attachment and brand activity. In other words, these

five dimensions assess different facets of customer mind-set. Brand awareness is the first level among the five dimensions. It is defined as the consumer's ability to identify (recognize or recall) the brand within the product category, in sufficient detail, in order to make a purchase (Rossiter & Percy, 1997). Brand awareness involves two components: 1) brand recall, which refers to consumers' ability to remember the brand without being exposed to any cue of the brand name; and 2) brand recognition, which refers to consumers' ability to "recognize" the brand when being presented to brand cues. As brand name is akin to the anchor for other brand associations to be built on and linked to (Aaker, 1991), planting the "brand name" in a consumer's mind is the premise to building "brand knowledge" later on.

The second dimension, brand associations, refers to "the strength, favorability, and uniqueness of the perceived attributes and benefits for the brand" (Keller & Lehmann, 2003, p. 28). Brand associations are the sources of brand equity. Brand awareness and brand associations compose the overall brand knowledge in customer mind according to the customer-based brand equity concept (Keller, 1993). Brand attitude is the overall assessment of the brand, while brand attachment refers to customers' loyalty to that brand. For instance, a customer's repeat purchase reflects the behavioral loyalty toward a brand. Besides the behavioral loyalty, customers may be attached to the brand attitudinally. For example, customers may be reluctant to switch to other brands even if other brands are at a price discount. Brand loyalty (Aaker, 1991), brand trustworthiness (Lasser et al., 1995), brand attachment (Lasser, Mittal, & Sharma, 1995), and brand disposition (Keller, 2001) assess customer brand attachment.

Finally, brand activity refers to the brand related activities in which customers are engaged. For instance, customers may search information about the brand or spread positive word-of-mouth of the brand on their own initiative. Also, customers may organize brand communities with other users for this brand. The Harley-Davidson Community is a good example.

Some researchers intend to develop an overall measure of brand equity in customer mind-set. For instance, Netemeyer et al., (2004) assessed four dimensions of customer mind-set: perceived quality, perceived value for the cost, uniqueness, and the willingness to pay a price premium. Yoo and Donthu (2001) measured three dimensions of the brand equity, including: brand loyalty, perceived quality and brand awareness/associations. Lasser et al. (1995) also developed a brand equity scale for televisions and watches by using five dimensions: performance, social image, value, trustworthiness, and attachment.

The other group of customer mind-set measures attempts to summarize the added value of a brand into a single number (Kamakura & Russell, 1993; Louvier & Johnson, 1988; Park & Srinivasan, 1994; Rangaswamy, Burke, & Oliva, 1993; Srinivasan, 1979). For instance, Louvier and Johnson (1988) define the added value as additional customer utility which could not be explained by product attributes. Kamakura and Russell (1993) regard the brand value as "utility intrinsic" to a brand not captured by its tangible characteristics and its short-term prices. Decomposition method is often utilized to obtain the brand value. For example, Park and Srinivasan (1994) decompose the brand intangible value into the attribute specific value and non-attribute specific value

generated from the overall brand impression. Rangaswamy et al. (1993) decompose the utility of brand value into three parts: the utility from attributes, utility from the brands, and utility from the interaction of brands and attributes. Kamakura and Russell (1993) decompose the added value of the branded product into brand tangible value and brand intangible value. Essentially, this group of measures regards "brand equity" as the value endowed by the brand name only. Thus, these works all try to single out the "brand name" effects from the value provided by the brand's attributes or benefits. And, these measures aim to give an overall assessment of customers' views toward the brand.

Conceptually, such brand equity measures are different from the major customer mind-set measures which do not separate the brand name from the value provided by the product. This group of measures will not be discussed further in the remaining part of the thesis.

In summary, the five brand dimensions in customer mind-set could be classified into two big groups: brand knowledge and brand reactions. In particular, brand awareness and brand associations constitute brand knowledge. And brand knowledge is the source of customers' reactions toward a brand. Brand attitudes, brand attachment and brand activity constitute brand reactions. They are the results from brand knowledge. This study will focus on the first two dimensions, namely, brand awareness and brand associations.

### *2.2.3 Product-market Performance Measure*

Product-market performance measures assess the brand market performance resulting from brand equity. Brand performance measures include six key dimensions, such as

price premium, price elasticity, market share, expansion success, cost structure and profitability. Price premium (e.g. Aaker, 1991; Bello & Holbrook, 1995; Holbrook, 1992) assesses the customers' willingness to pay a higher price for a comparable product because of the brand. Price elasticity gauges the customers' price sensitivity toward a brand. Generally, low price sensitivity suggests that customers are loyal to this brand. In addition, low price sensitivity may also imply brand uniqueness. Brand market share measures the relative market position of a brand (e.g. Aaker, 1991). A large market share suggests that this brand is the market leader of this specific product category. The first three dimensions of brand performance summarize the capability of the brand of generating revenue for the brand. However, none of these measures assess the overall performance of brand equity in the market. For instance, a big market share may be the result of deep price cut. And a brand which charges price premium is likely to target a small market segment. A recently developed measure, revenue premium (Ailawadi et al., 2003) uses the revenue of the private label as the basis of benchmarking. Then, the brand equity of branded products is assessed by taking the differences between the private label's revenue and the branded product's revenue. Thus, revenue premium gives a more complete view than other product-market performance measures, such as market share or price premium, by considering both the sales and the price of a brand. In this study, revenue premium will be used as the overall measure of brand product-market performance.

The fourth dimension, brand expansion, assesses the potential of a brand. And the fifth dimension, cost structure measures whether the customer mind-set decreases the cost of

marketing activities. Because of differences of brand knowledge in customers' minds, customers will react differently to the marketing activities of different brands. A brand with strong, favorable and unique brand associations will generate a more favorable response from customers. Therefore, the effectiveness of marketing activities is enhanced. Given all the previous five dimensions, the increase in the brand profitability is the ultimate result of brand performance in the market. However, such measures are rarely available because the cost information is not usually available to researchers.

Product performance measures provide a single figure of brand equity; therefore, they are appealing for financial valuation purposes. Also, the data are readily available compared to the customer mind-set measures. Consequently, it is easy for managers to benchmark and track the changes in brand equity.

### *2.2.4 Firm Level Performance Measure*

Firm level performance measures assess the value created by the brand to the overall corporation. Such measures regard brand as a financial asset of a firm, and the measures help managers to decide the firm value during mergers or acquisitions among corporations. For instance, based on the financial value of a firm, Simon and Sullivan (1993) define brand equity as the incremental cash flows accrued to the branded product. And, they estimate the brand's equity by extracting the brand's value from the value of the firm's other assets. The annual Business Week's publishing of "The Top 100 Brands" estimates each brand value on the basis of projected profits discounted to a present value. This estimation process involves some subjective assessment of the brand's future

potential, such as the risk profile, stability and global reach of the brand. This measure generally isolates the focal brand from the product or the firm, which is regarded impossible by some researchers (Barwise, 1993). In addition, assessment of the firm's stability or risk profile introduces subjectivity into the measure (Ailawadi et al., 2003). Finally, some data, such as stock market data, might not be available to some private firms, and the stock market volatility may cast doubts on such measures as well (Ailawadi et al., 2003).

Although various brand equity measures are proposed, the relationship between the different types of measures is rarely investigated. Only Silverman et al. (1999) have examined the relationship between consumer-based sources of brand equity to market outcomes. Specifically, they relate the consumer-based sources measures, such as brand awareness and brand associations, to the annual sales of a brand and the annual ratings provided by Financial World. However, they found a weak relationship between brand awareness and market outcomes.

Understanding the nature of different brand equity measures and their relationships is essentially important for both managers and academia. It would help the managers to choose measures when they want to track brand equity. In addition, when discrepancies of different measures occur, they would be able to identify the underlying reasons. Furthermore, as proposed by conventional understanding of brand equity measures, customer mind-set measures provide more diagnostic information to managers than the

product-market outcome measures. However, so far, little research has explored or demonstrated such notions.

Given the variety of brand equity measures, this thesis focuses on two specific measures in customer mind-set as the focus of study: brand awareness and brand associations (brand associations are called "customer mind-set measure" throughout the rest of this work), because they are the two components of brand knowledge in customers' mind. In addition, revenue premium is chosen as the measure of product-market performance. In the following sections, the relationship between customer mind-set and product-market performance measures will be discussed.

### 2.3 Relating Customer Mind-set and Product-market Performance Measure

In this section, I will utilize the Brand Value Chain model to explore the conceptual similarities, differences and relationship between customer mind-set measures and product-market performance measures. Relevant literature is discussed and hypotheses are proposed accordingly.

The current literature generally regards that customer mind-set measures offer good diagnostic value for managers. Managers could choose specific measures for their brands according to their marketing goals. In addition, such measures would help managers to predict the potential of the brand, such as brand extendibility and global brand expansion capability (Ailawadi et al., 2003). Product-market performance measures do not provide

a diagnostic view of the underlying strengths and weaknesses of a brand (Ailawadi et al., 2003). Hence, they do not provide managers the requisite information if they want to build the brand equity in the customer's mind. In addition, such measures may just measure one aspect or certain results of the brand equity. Therefore, they are likely to give some biased information to managers. For example, Bello and Holbrook (1995) conducted a study to measure brand equity in terms of price premium. In the context of both nondurable and durable product categories, they found the absence of price premium. They also concluded that there is an absence of brand equity across product classes. Additionally, Ailawadi et al. (2003) pointed out that high market shares may come from deep price cuts. Price premium measures may not represent the current value-conscious consumer attitude toward a brand.

However, except for these general thoughts regarding the two types of measures, little research has been conducted to explore the similarities, differences and relationship between different brand equity measures. In the following discussion, I will explore the conceptual differences and similarities of customer mind-set measure and market performance measures.

### *2.3.1 Correlation between Customer Mind-set and Product-market Performance Measures*

Customer mind-set measures and market performance measures are supposed to measure the same underlying constructs. According to the Brand Value Chain (Keller & Lehmann, 2003), customer mind-set measures and product-market performance measures assess

brand equity at different stages of the value chain. Customer knowledge, attitude and attachment toward the brand must be transferred into purchase activities, so that the brand equity will be reflected by the brand's market performance. Therefore, the two measures should be positively correlated.

H1: Customer mind-set and revenue premium are positively correlated.

Brand awareness is regarded as the premise of brand equity. Customers need an "anchor" to link the brand-related information to the brand name. Hence, whether the brand can be recognized and recalled by customers is the first step in building brand equity (Aaker, 1991; Keller, 1993). In addition, for low-involvement consumer packaged goods, the top-of-mind awareness of the brand is very critical for consumers in making purchase decisions (Elliott & Percy, 2007). Therefore, it is hypothesized that:

H2: Brand awareness and revenue premium are positively correlated.

### *2.3.2 Associations of Brand Equity Measures with Marketing Activities*

In this section, I will discuss the correlation of the two brand equity measures with four important marketing activities, including advertising, distribution, price and price promotion. Specifically, the study will first discuss the impact of marketing mix elements on brand equity based on Keller (1993)'s customer-based brand equity concepts. The relevant literature will be reviewed in order to determine the impact of marketing mix elements on brand equity through effects on brand awareness and brand image respectively (Table 1, Appendix). Then, the possible differences in the correlations with

marketing activities between the customer mind-set and product-market performance measures will be explored.

**Advertising:** Advertising is identified as one of the most important marketing activities in building brand equity (Aaker, 1991; Cobb-Walgren, Ruble, & Donthu, 1995; Keller, 1993, 2002; Simon & Sullivan, 1993; Yoo, Donthu, & Lee, 2000). Brand equity should be positively correlated to advertising expenditure. Firstly, advertising creates and increases brand awareness by offering exposure of brands to customers (Aaker, 1991; Batra, Lehmann, Burke, & Pae, 1995; Keller, 1993; Rossiter & Percy, 1987; Yoo et al., 2000). Krishnan and Chakravarti (1993) reviewed forms of memory induced by advertising and demonstrated empirically that advertising not only creates brand awareness but also increases the brand's likelihood of being included in consumers' consideration set, thereby enhancing the brand equity. Empirical work has investigated the impact of advertising in increasing brand awareness. Using consumer survey data, Yoo et al., (2000) demonstrated that brand associations (brand awareness) are related positively to the advertising expenditure invested in the brand. In summary, advertising expenditure is positively related to brand awareness.

Furthermore, advertising creates and maintains positive brand image by, for instance, positioning the product, enhancing the perceived quality, and reinforcing brand loyalty. Generally, brands with a group of strong, favorable, and unique brand associations enjoy positive images. Advertising helps to build and enhance brand equity in two ways. First, advertising increases the perceived quality of the brand. Product quality is essentially

important for companies to build favorable brand associations (Farquhar, 1989); and, advertising is regarded as an effective tool by which to increase the perceived quality of the brand (Kirmani, 1990; Kirmani & Wright, 1989; Moorthy & Zhao, 2000; Nelson, 1970, 1974; Simon & Sullivan, 1993; Yoo et al., 2000). From the perspective of signaling theory, products are classified into two types: 1) search goods and 2) experience goods. The quality of search goods can be inspected prior to the purchase, while the quality of experience goods can only be detected after the usage. For search products, advertising serves as a direct source of product information (such as attributes, functions, or where to buy) to consumers. For experience goods, advertising provides product quality information indirectly, by serving as a "signal" of quality (Nelson, 1970, 1974). Also, from a consumer behavior perspective, Kirmani & Wright (1989) suggested that consumers use "advertising expenditure" as a surrogate for a company's marketing efforts. Because consumers believe that the investment in advertising must be recovered from sales and future repeat purchases of the product, they in turn conclude that only companies confident in their product quality will invest a lot in advertising. In addition, the observations of the positive correlation of advertising expenditure and product quality in the market reinforce such beliefs. Besides, consumers use "advertising expenditure" as a surrogate for a company's financial resources. As such, they believe that companies with abundant financial resources can only produce quality products. Kirmani & Wright (1989) illustrated the relationship between advertising and perceived quality using experiments. Specifically, they demonstrated that consumers are able to decode the "campaign" elements of advertising and develop product quality perceptions. Furthermore, using secondary data from the market, Moorthy and Zhao (2000)

investigated the relationship of advertising expenditure and perceived quality for both durable and nondurable products. By controlling price, objective quality, and market share in their model, they demonstrated a positive relationship between advertising spending and perceived quality for both durable and nondurable goods. Therefore, advertising contributes to building a "favorable" brand association by enhancing the perceived quality of a brand. Advertising also creates positive brand attitude (Farquhar, 1989). Advertising helps induce positive feelings toward the brand. These positive feelings are then stored in consumers' memories as part of their "brand associations". In this manner, "brand knowledge" is being influenced by advertising (Edell & Moore, 1993). Secondly, advertising increases the uniqueness of brand associations. Advertising helps to build the uniqueness of brand associations (i.e., to position the brand) (Aaker & Shansby, 1982). Advertising induces product differentiation which, in turn, builds brand loyalty, reduces consumers' price sensitivity, and raises the entry barriers (Comanor & Wilson, 1974).

In sum, advertising not only creates and enhances brand awareness, but also builds a favorable, strong, and unique brand image. Hence, brand equity is positively correlated to advertising. Empirical studies have also demonstrated the positive relationship between advertising and brand equity. Simon and Sullivan (1993), in identifying determinants of brand equity, found that advertising increases brand equity. Cobb-Walgren et al. (1995) found a positive relationship between advertising and brand equity in both product and service categories. Yoo et al. (2000) also demonstrated that higher levels of perceived advertising expenditure are positively correlated to brand awareness/associations,

perceived quality, and brand loyalty. In this way, the overall brand equity is increased by advertising expenditure.

**Distribution:** Distribution intensity is important in building brand equity, especially for packaged consumer goods. Firstly, it enhances brand awareness, an important component of brand equity (Aaker, 1991; Keller, 1993). Anything that causes exposure of a brand to consumers contributes to the establishment of brand awareness (Keller, 2002). Repeated exposure of brands in stores leads to consumers' ability to recognize and recall the brand. In addition, since products are organized by "categories" in retail stores, consumers are exposed to brands by each category. That is, consumers are exposed to an environment where the linkage between brand and the related product class is naturally presented. Therefore, distribution helps to establish the brand and product class linkage. Furthermore, for frequently purchased products, shelf visibility (distribution) alone will generate brand awareness and product trial (Smith & Park, 1992). Such trials provide consumers with personal experience with the products, and, in turn, this experience helps to build brand knowledge, including brand awareness and brand image. Secondly, intensive distribution builds satisfaction. Literature on consumers' reaction to out-of-stock (OOS) situations supports the importance of product "availability". Switching to other brands is the predominant reaction to OOS (Corstjens & Corstjens, 1995). Although temporary OOS is different from the "unavailability" of products, OOS research reveals the possibility of brand switching or the cancelling of purchases when consumers can't find their preferred brands, even temporarily. The absence of a product on the shelf leads to the re-evaluation of the product, and may adversely impact the attractiveness of a

product in the long run. Hence, consumers may change their assessment of the utility of less available products. Less available products will be at a greater disadvantage compared to those widely distributed products. For convenience goods, where consumer loyalty is relatively low, consumers have more opportunities to buy the more available products (Reibstein & Farris, 1995). If the brands are widely distributed, consumers save time and effort in traveling and searching for the products. This will increase customer satisfaction (Smith & Park, 1992; Yoo et al., 2000) which will, in turn, help develop a good brand image. Therefore, distribution is positively correlated to brand equity.

**Price:** Price level is generally positively correlated to quality levels (Keller, 2002). From a consumer behavior perspective, consumers use price as a quality cue to make efficient purchase decisions, that is, in achieving the cognitive efficiency (Rao, 2005; Rao & Monroe, 1989). Empirical results support the notion (Rao & Monroe, 1989). Tellis and Wernerfelt (1987) found a positive correlation between price and quality. In a recent study, Shiv, Carmon and Ariely (2005) found placebo effects of price. They demonstrated that marketing mix elements influence and shape consumers' expectancy of product performance. Furthermore, such expectancy will influence the actual evaluation of product performance. The study also demonstrated that such expectancy can be induced by price. From an information economy perspective, price is illustrated as a signal of the quality. Price is used as a quality signal when there is: 1) asymmetric information (i.e., buyers do not know the quality of the product); 2) a market composed of a small group of quality-sensitive consumers; and 3) a large group of price-sensitive consumers. The high-priced but low quality product will not attain "repeat purchases";

hence, its future revenue would be at stake. The market equilibrium implies that quality products are high-priced, while low quality products are low-priced. In sum, consumers understand price as an indicator of "quality" from manufacturers. Furthermore, consumers believe that only firms of good quality will advertise (Nelson, 1974). This paper proposes that such "signals" of quality reinforce each other resulting in synergies. Indeed, Shiv et al. (2005) found that advertising reinforces the expectancy induced by pricing in consumers' minds. As price is positively correlated to perceived quality, Yoo et al. (2000) demonstrated that price is positively related to brand equity. Ability to charge price premiums is cited as one of the advantages provided by brand equity. In summary, price is positively related to brand equity.

**Price Promotion:** Price promotions refer to the monetary incentive offered to the final target consumer, mainly including coupons, price cuts, or free products (Palazon-Vidal & Delgado-Ballester, 2005). Price promotion is documented as having substantial impact on short-term sales. As a result, it has been widely implemented by marketing managers (Blattberg et al., 1995). Consumer product companies are spending more money on promotion than advertising because of its effectiveness in generating sales in the short run (Blattberg et al., 1995). From 1978 to 2001, trade promotion spending increased from 3% to 61% of firms' marketing budget; while advertising spending fell from 40% to 24% of marketing expenditure (Lodish & Mela, 2007).

However, price promotion is not free of criticism. First, price promotion erodes brand equity (brand evaluation) in the long run (Angel & Manuel, 2005). For instance, brand

loyalty will be decreased because price promotion encourages brand switching. Secondly, price cuts will lead consumers to adopt a lower quality perception of the product, which in turn endangers the brand's evaluation (Darke & Chung, 2005; Keller, 2002). Furthermore, frequent price promotions also negatively impact consumers' internal reference prices, which, in turn, makes consumers reluctant to buy the product at its regular price (Lattin & Bucklin, 1989).

Although plenty of studies demonstrate negative effects of price promotion on brand evaluation, the issue, that price promotion erodes brand equity, is still debatable in academia (Blattberg et al., 1995). A few researchers instead found no effects of price promotion on brand evaluation (Bawa & Shoemaker, 1987; Davis, Inman, & McAlister, 1992). These findings, within the various studies, were attributed to the following reasons: data aggregation problem (Neslin & Shoemaker, 1989), differences in product category (Bawa & Shoemaker, 1987; Davis et al., 1992; Ehrenberg, Hammond, & Goodhart1994), industry norms (Nelsin & Shoemaker1989; Raghubir & Corfman, 1999), and brand name/quality (Raghubir & Corfman, 1999). For instance, Neslin and Shoemaker (1989) provided an alternative explanation for the decrease in after-deal purchase rate found by Dodson et al. (1978) and other researchers. They found that a deal attracts many consumers whose purchase probability is very low or zero when there is no price promotion. When the deal is retracted, the overall after-deal purchase rate is driven down by the repeat purchase rate of this group of consumers (switchers). Indeed, the after-deal purchase rate of those consumers who buy the product without a price promotion does not change significantly. Neslin and Shoemaker (1989) identified such a problem as a

"statistical aggregation problem". They demonstrated that because of this statistical aggregation problem, the after-deal purchase rate is lowered even if the promotion has no effect on an individual's purchase probability. In addition to the statistical aggregation problem, researchers identified the product category as a reason for their findings – no effects of price promotion on brand equity (Davis et al., 1992; Neslin & Shoemaker, 1989). In an analysis of 25 consumer packaged goods categories, Ehrenberg et al. (1994) compare the sales volumes and repeat purchase probability before and after price promotions. The results indicate that the price promotion attracts existing consumers, and these consumers' purchasing patterns will not change after retraction of the deal. Hence, no significant differences between before- and after-deal repeat purchase rates are found. The authors conclude that price promotion does not affect brand loyalty negatively. Contrary to Ehrenberg et al. (1994), Bawa and Shoemaker (1987) demonstrate that the largest increase in the probability of purchasing a product using coupons is after the deal occurs among infrequent users or nonusers, while the frequent users' purchasing patterns do not change. Although they reach the same conclusion that brand loyalty is not negatively affected by price promotions, the logic underlying the two studies is quite different. By comparing the before-to-after price promotion brand evaluations, Davis et al. (1992) found no differences. The above studies attribute the absence of negative effects of price promotion to consumers' low involvement in shopping for consumer packaged goods. In a low involvement shopping context, price promotion mainly influences consumers on the point-of-purchase (Assael, 1987); however, the impact should diminish immediately. In a low involvement shopping context, some consumers could not even recall by how much percentage the price was discounted after the experiments

(Davis et al., 1992). Although researchers stated that price promotion is unlikely to have negative effects on brand equity for consumer packaged goods, most of the studies that found negative effects used consumer packaged goods categories (Gedenk & Neslin, 1999; Huber, Holbrook & Kahn1986; Kalwani & Yim, 1992; Lattin & Bucklin, 1989; Mela et al., 1997; Papatla & Krishnamurthi, 1996; Yoo & Donthu, 2001). As such, it seems that product category is not the main reason for the absence of negative effects of price promotion on brand evaluation.

The discrepancies found in these empirical studies regarding the impact of price promotion on brand equity may be due to the following reasons. First, the different findings can be attributed to different dependent variables used in the studies. Early studies used "post deal repurchase probability" (Dodson, Tybout, & Sternthal, 1978; Guadagni & Little, 1983) which was later challenged by Neslin and Shoemaker (1989). Later on, other dependent variables were investigated, including price sensitivity (Mela et al., 1997), expected price (internal reference price) (Kalwani, Yim, Rinne, & Sugita, 1990), and perceived quality (Kahn & Louie, 1990). However, post deal repurchase probability, price sensitivity, and/or expected price are not equivalent to brand equity/brand evaluation. Very few studies use "brand evaluation" as the dependent variable. Davis et al. (1992) use brand evaluation measures based on the work of Farquhar (1989). The measures include three components - affective, cognitive, and behavioral. Conceptualizing brand equity as the difference in a consumer's choice between the branded product and an unbranded product, Yoo et al. (2000) developed a consumer-based overall brand equity scale which consisted of eighteen items. These

items mainly concern the comparison between a focal branded product and an unbranded product. In addition, the authors also measured the three dimensions of brand equity, namely, brand loyalty, brand awareness, and perceived quality. They examined the relationship between price promotion and overall brand equity. A negative association between the frequency of price deals and overall brand equity was found. Furthermore, the frequency of price deals is also found to be negatively associated with two dimensions of brand equity, namely, perceived quality and brand associations/awareness.

The second reason for the discrepancies in empirical findings is the "long-term effects" problem. Mela et al. (1997) defined long-term effects as "the cumulative effect on consumers' brand choice behavior, lasting over several years" (p. 249). They also define short-term effects as "the immediate (weekly) effect of promotion on sales or share of a brand" (p. 249) and medium-term effects as the "4- to 16-week effects of promotion" (p. 249). Close examination of current studies regarding price promotion effects on brand evaluation indicates that not all of the studies really investigate the long-term effects of price promotion. For instance, many studies which investigate the effects of price promotion on repeat purchase probability focused on short-term effects (Dodson et al., 1978; Guadagni & Little, 1983; S. A. Neslin & R. W. Shoemaker, 1989; Shoemaker & Shoaf, 1977). Furthermore, many experimental studies used to study consumer response to price promotions were based only on one price promotion event (Darke & Chung, 2005; Doob, Carlsmith, & Freedman, 1969; Raghubir & Corfman, 1999). A few studies examine the medium-term effect (4 to 16 weeks) of promotion on brand share and brand evaluation (Davis et al., 1992; Ehrenberg et al., 1994). For example, Ehrenberg et al.

(1994) compared the repeat purchase rate before and after eight weeks of the price promotion. Davis et al. (1992) compared the consumers' brand evaluation of several consumer packaged goods before the experiment, and then the brand evaluations were measured again after three months of field experimentation.

Some recent studies tend to focus on the "long-term" effects of price promotion. Using scanner data over eight years, Mela et al. (1997) studied the long-term effects of price promotion on consumers' price sensitivity. They found that price promotions make consumers more price-sensitive in both the loyal and non-loyal segments. Hence, they concluded that price promotion affects the brand evaluation negatively in the long run.

Although some researchers do not state explicitly that they are investigating the long-term effects of price promotion, they model the cumulative effects of price promotion on expected price or brand loyalty. For instance, by modeling the feedback effect of price promotion on brand loyalty, Gednek and Neslin (1999) found that in-store price promotion has negative event feedback effects on brand loyalty. Kalwani et al. (1990), examining the cumulative effects of price promotion on the formation of consumers' expected price, demonstrated that the frequency of promotion decreases consumers' expected price. Except for the work of Boulding et al. (1994), studies focusing on long-term effects found negative effects of price promotion on brand evaluation. Boulding et al. (1994) divided the brands into three groups according to their price level. They found that for firms with above average prices, price promotions negatively affect price elasticity. But no effects were found for firms charging average prices. For firms charging the

lowest prices, price promotions decrease price elasticity for the brand. However, their model has two assumptions. It assumes that all communication activities are designed to increase brand awareness. It also assumes that senders choose messages they perceive to be positive. According to brand equity conceptualization, a brand with favorable equity enjoys high brand awareness, as well as positive and unique brand associations. If these two assumptions are followed, the main focus of their study would be the "uniqueness" of a manufacturer's message. However, the second assumption tends to be unrealistic. Even though senders (manufacturers) choose only positive messages, receivers may not necessarily perceive the messages as "positive". With such strong assumptions, it seems that this study investigated only the effects of price promotion on the uniqueness of brand associations.

In sum, the discrepancies of empirical results in the literature can be attributed to the two main reasons discussed above, namely: 1) few researchers used "brand equity" measures as a dependent variable to indicate the change of consumers' perception of promoted brands, and 2) long-term effects of price promotion on brand equity were examined in very few studies.

By utilizing the customer-based brand equity concepts of Keller (1993), I studied how price promotion impacts brand image and brand uniqueness and, in turn, influences brand equity.

Firstly, price promotion erodes brand equity (brand evaluation) in the long run (Angel & Manuel, 2005). Price promotion decreases a brand's image (i.e., favorability and uniqueness of brand associations). Based on cognitive dissonance theory, if the product is purchased on deal, consumers are likely to attribute their purchase to the monetary incentives, not to the intrinsic benefits offered by the product. Thus, brands purchased at a discount are less favoured by consumers (Doob et al. 1969). Consequently, a brand's image in consumers' minds is adversely impacted by price promotions. Secondly, price discounts also decrease the perceived quality of the brand (Darke & Chung, 2005; Yoo et al., 2000; Raghubir & Corfman, 1999). Frequently discounting products will decrease the internal reference price of the brand. As price is used as one of the quality cues, too frequent price promotions will lead to decrease in perceived quality of the brand. Therefore, price promotions negatively influence consumers' attitudes toward the brand, as well as decreasing the perceived quality of the brand. Finally, price promotion decreases the brand's uniqueness. Both self-perception theory and cognitive dissonance theory postulate that consumers are likely to attribute their purchase of a brand to price promotions, but not to the intrinsic benefits offered by that brand. By stressing the price association of the brand, frequent price promotions will make the price the predominant brand association in the consumer's perception. Therefore, the brand will lose its uniqueness. In addition, Kaul and Wittink (1995) found that price advertising leads to higher price sensitivity among consumers. If we view "price promotion" as a type of communication activity by a company, then frequent price promotions emphasize the brand's price only. Hence, such communication would decrease the uniqueness of the brand and increase consumers' price sensitivity. In sum, frequent price promotions

negatively affect the consumer's attitude toward the brand, and also decrease the perceived brand uniqueness in the mind of the consumer. In sum, it is expected that price promotion is negatively related to brand equity.

### *2.3.3 Effects of Marketing Activities on Different Measures*

**Customer Mind-set and Revenue Premium:** Customer mind-set and revenue premium measure the same underlying construct, brand equity. Essentially, the two measures assess the reflection of brand equity on the different stages of the Brand Value Chain. Therefore, it is expected that their respective correlations with marketing mix elements are more or less similar. Both of them are positively correlated with advertising, distribution and price. And, price promotion is expected to be negatively related to both customer mind-set and revenue premium measure.

H3: The associations of marketing mix elements, specifically, advertising, distribution, price and price promotion have similar associations both customer mind-set and revenue premium measure respectively.

**Brand Awareness and Overall Brand Equity Measures:** Brand awareness is generally created by customers' experience with the product. Anything that exposes the brand to customers has the potential to generate brand awareness (Keller, 2002). As discussed in the previous literature review section, advertising and distribution are effective means by which to generate and increase brand awareness by exposing the brand to customers repeatedly. Therefore, it is expected that brand awareness is positively correlated to both advertising and distribution. However, price promotion is expected to have a negative

association with overall brand equity. Yet, price promotion induces brand switchers and creates product trials for the brand. Hence, such product experiences will enhance brand awareness for the brand. Furthermore, customers' usage of the brand not only enables customers to recognize the brand but also establishes the linkage between the brand with a specific product category. Finally, price promotion is also found to increase market penetration (Ailawadi, Lehmann, & Neslin, 2001). Hence, price promotion is expected to be positively correlated to brand awareness. As for the effects of price, there was no significant relationship found between price and brand awareness in the extant literature. In conclusion, some differences are expected to be found in the impacts of marketing mix elements on brand awareness from the impact of marketing mix on overall brand equity measures. Specifically, it is proposed that:

H4: Price promotion is positively related to brand awareness.

### *2.3.4 Reflection of Cumulative Brand-building Effects*

Both customer mind-set and product-market performance measures are supposed to measure the common underlying construct: brand equity. According to the Customer-Based Brand Equity concept, brand equity resides in the customer's mind: brand knowledge. And, such knowledge is built over the years (i.e., what customers have experienced and learned about the brand over time form the brand knowledge). Therefore, essentially, brand equity is a long-term concept which should reflect the investment in the brand in the past (Keller, 2002).

Customer mind-set measures reflect a customer's brand knowledge. It has several dimensions, including: brand awareness, brand associations, brand attitudes, brand attachment, and brand activity. It is a direct measure of brand equity, as some researchers put it (Keller, 2002). Hence, it is the direct measure of the long-term brand-building activities.

On the other hand, product-market performance is the result of customers' brand knowledge. It is an indirect measure of brand knowledge, compared to customer mind-set measures (Keller, 2002). Many other factors may moderate this process when the customers' brand knowledge is being translated into the brand's market performance. Competitive reaction, customers' profile, and size and channel support are named as possible factors to moderating this procedure (Keller & Lehmann, 2003). Furthermore, some marketing activities take a long time to exhibit their impact on brand equity. Price promotion might be a good example. Generally, it is regarded that price promotion has negative influence on brand equity over the long run. However, price promotion is very effective in generating sales in the short-term. Therefore, as an indirect measure of brand equity, product-market performance measures capture less long-term effects, compared to the customer mind-set measures.

H5: Customer mind-set measures capture more cumulative brand-building effects than product-market performance measures.

### *2.3.5 Customer Mind-set Predicts Product-market Performance Measures*

According to the customer based brand equity concepts, the power of a brand resides in the mind of customers. Brand knowledge in customers' minds determines the differential response of customers to the marketing activities from different brands (Keller, 1993). As discussed in the literature review section of brand equity concept, it is brand knowledge, such as brand awareness and brand associations, which determine whether the brand provides additional value to customers, besides the functional value offered by the product itself. In addition, the Brand Value Chain also models the customer mind-set as the precedents of the brand's market performance. Therefore, it is proposed here that:

H6: Customer mind-set measures predict product-market performance measures.

H7: Brand awareness predicts product-market performance measures.

## Chapter Summary

This chapter mainly explores the conceptual similarities, differences and relationship between two types of brand equity measures: customer mind-set measure, and product-market performance measure. It starts with the literature review of brand equity concepts. Then, three types of brand equity measures are discussed, namely, customer mind-set, brand's market performance and firm-level performance measures. The Brand Value Chain (Keller & Lehmann, 2003) is presented and utilized to facilitate the subsequent discussions about the customer mind-set measure and product-market performance measure. In particular, it is hypothesized that customer mind-set measure and product-market performance measure are positively correlated. In addition, the effects of marketing mix elements are proposed to be similar on both customer mind-set and

product-market performance. However, customer mind-set measure is capable of capturing more cumulative brand-building effects than the product-market performance measure. And, the customer mind-set measure is proposed to precede the product-market performance measure. Finally, this chapter also discusses the differences between brand awareness measure and the overall brand equity assessment. It is proposed that the marketing mix elements' impacts on brand awareness are different from their impacts on the overall brand equity assessment. In particular, price promotion is proposed to be positively related to brand awareness.

# CHPATER 3: METHODOLOGY

This chapter presents the research methodology used to test the hypotheses that were developed in Chapter 2. To facilitate the discussion of the methodology, this chapter is divided into three broad sections: operationalizations of variables, data collection and analysis techniques. First, the variables used in the present research and their respective operationalizations are described. Next, the data sources and method of data collection are presented. Finally, techniques utilized for empirical analyses are presented.

## 3.1 Operationalizations of Variables

### *3.1.1 Brand Equity Measures*

I use two types of brand equity measures to assess the overall brand equity, namely, customer mind-set measure and product-market performance measure.

*Measure of Customer Mind-set*

A consumer packaged goods company provided data on customer mind-set measure of brand equity, which is rooted in Keller's customer-based brand equity concept (1993). The data consists of brand equity measures of 11 major brands in a consumer products category for every six months, for three years, beginning January 2004. In particular, the data involves four major brand equity measures, which are brand performance, brand image, brand judgment, and brand feelings. Specifically, nine statements each are developed to measure brand performance, brand image, and brand judgment respectively. And, 10 statements are designed to measure brand image. Each statement describes how

a customer might feel/think about a brand. If respondents agree with this description, they are asked to check "yes"; otherwise, they check "no". Respondents only consider the brands they know. Hence, the measure of brand performance, brand image, brand judgment and brand feelings are indicated by the percentage of respondents who checked "yes", out of all the respondents who know the brand. The overall brand equity measure is obtained by taking the average ratings of all the statements.

*Measure of Product-market Performance: Revenue Premium*

Revenue premium (Ailawadi et al., 2003) is chosen as the brand equity measure in terms of product-market performance. Revenue premium is defined as the revenue difference between branded products and private label products. Specifically:

$$\text{Re}\,venuepremium_b = (Volume_b)(\text{Pr}\,ice_b) - (Volume_{pl})(\text{Pr}\,ice_{pl}) \quad (1)$$

Where,

$Volume_b$ : the sales volume of a brand;

$\text{Pr}\,ice_b$ : the net price of a brand;

$Volume_{pl}$ : the sales volume of a private label;

$\text{Pr}\,ice_{pl}$ : the net price of a private label.

According to the work of Ailawadi et al. (2003), brand equity is built through the marketing activities of the brand, as well as the activities of its competitors. Therefore, the brand equity is an equilibrium situation reached by the marketing activities of both the brand and competitors. And, revenue outcome shall represent such equilibrium.

Revenue premium measure of brand equity is chosen for the following reasons. Firstly, revenue premium gives a more complete view than other product-market performance measures, such as market share or price premium. The big market share of a certain brand might come from a deep price cut. The price premium charged by a brand may only represent a small privileged market segment. Revenue premium considers both the price and the sales of a brand. Secondly, the measure's reliability and validity are tested and proved (Ailawadi et al., 2003). For instance, the correlation of revenue premium, with its lagged value, is over 0.95, meeting the stability requirement of brand equity measure (Ailawadi et al., 2003). Thirdly, the revenue premium measure of brand equity provides a convenient approach to compute brand equity since the necessary data are readily available. Finally, calculation of the revenue premium measure requires using the private label's revenue as a benchmark. And, for this product category of our dataset, private labels exist.

However, caution must be taken while using this measure. Firstly, it is suggested to use the revenue premium for the long-term data. Because the revenue premium measure assumes that brands pursue rational equilibrium, such equilibrium is likely to hold in the long run. In the work by Ailawadi et al. (2003), the revenue premium of each brand is measured annually.

Different from Ailawadi et al. (2003)'s work, this study uses the semi-annual revenue premium measure in order to match the customer-mind set brand equity measure. The subsequent analysis would demonstrate that the semi-annual revenue premium is very

stable in this current dataset. Hence, the measure stability issue is not a concern in this study.

Secondly, the revenue premium measure requires the existence of private labels in the market. If there is no private label in certain product categories, Ailawadi et al. (2003) suggest that the lowest prices or the lowest-share brand-based revenue premiums could be utilized. The current data set contains private labels.

*Brand Awareness*

In addition to the overall customer mind-set measure of brand equity discussed in the previous section, I have also included another important component of brand equity: brand awareness. The item measuring the brand awareness is: "have you ever heard or seen of Brand X?" Eleven brand names were listed in the questionnaire. The overall brand awareness of a certain brand is measured by the percentage of respondents who checked "yes".

*Other Product-market Performance Measures*

Besides the revenue premium measure of brand equity, I also use other product-market performance measures, including price premium (Bello & Holbrook, 1995; Holbrook, 1992), volume premium (Ailawadi et al., 2003), share premium (Ailawadi et al., 2003), brand market share and revenue. Specifically, price premium is measured as the difference between the brand's price and the private label's price. Market share equals the percentage of the dollar sales within the category's total dollar sales. Hence, the market

share premium is measured as the difference between the brand's market share and the private label's market share. Volume premium equals the difference between the brand's volume sales and the private label's volume sales. Finally, revenue is measured by the product of unit volume multiplied by the net selling price (Ailawadi et al., 2003). Table 2 summarizes a detailed description of variables and data source.

### *3.1.2 Marketing Mix Elements & Cumulative Brand-building Effects*

*Marketing Mix Elements*

Marketing mix includes advertising, distribution, price and price promotion. In this study, advertising is measured as advertising expenditure (,000) of every six months for each brand, and it is obtained from TNS media intelligence. Price, price promotion and distribution data are procured from Information Resources, Inc. (IRI). In particular, the average regular price (i.e., the non promotion price) is used as the price measure. Price promotion is measured as the percentage of sales made on price-promotion. Finally, distribution intensity is measured as the average percentage of ACV (all commodity volume).

*Cumulative Brand-building Effects: Household Penetration, Loyalty & Advertising Stock*

Household penetration is defined as the percentage of all panel households that make at least one purchase of the brand during a given time period. Loyalty is measured by Share of Category Requirement (SCR), which is each brand's market share among the group of households that bought the brand at least once during the time period under consideration. (Bhattacharya, Fader, Lodish, & Desrbo, 1996). It is a summary of the purchase behavior

history of a household (Ortmeyer, Lattin, & Montgomery, 1991). Therefore, it is chosen as the measure of the long-term effect of the firm's marketing activities. In the following sections, the two measures: household penetration and loyalty will be known as long-term factors.

I also employ advertising stock to capture the impact of the advertising expenditure of previous periods. The method to calculate advertising stock is as follows. Suppose that advertising for brand i in time t, $Ad_{it}$, affects its brand equity for the subsequent periods and, in turn, that brand equity in a given time period is affected by previous, as well as present, advertising. I use the Koyck-type models to study the advertising-sales relationship to calculate the advertising stock (Adstock) (Koyck, 1959). Adstock at time t can be written as:

$$Adstock_{it} = b_0 Ad_{it} + b_1 Ad_{it-1} + b_2 Ad_{it-2} + \ldots\ldots \quad (2)$$

Without large data set, it is practically impossible to calculate the coefficients for each period respectively; therefore, it is assumed that the coefficients show an exponentially decaying pattern over time (Pollay et al., 1996). Therefore, equation (2) could be rewritten as:

$$Adstock_{it} = b_0 Ad_{it} + b_0 \lambda Ad_{it-1} + b_0 \lambda^2 Ad_{it-2} + \ldots\ldots \quad (3)$$

Where $0 < \lambda < 1$. Writing out the expression for $Adstock_{it-1}$ and subtracting it from equation (3) produces:

$$Adstock_{it} = (AdStock_{it-1})\lambda + b_0 Ad_{it} \quad (4)$$

And, equation (4) can be further simplified by assuming $b_0 = 1 - \lambda$, thereby yielding

$$Adstock_{it} = (AdStock_{it-1})\lambda + (1-\lambda)Ad_{it} \quad (5)$$

Adstock is initialized equal to the brand's share of advertising expenditure in the first period for which advertising data is available (Pollay et al., 1996). For any value of $\lambda$, the Adstock measure for every other period is calculated using equation (4) successively on each brand's advertising share.

### 3.2. Data Collection

***Customer Mind-set Brand Equity Measure***

The customer mind-set brand equity measures (such as overall brand equity measures and brand awareness) are procured from a consumer packaged goods company. The company tracked 11 important brands in this category every half year from 2004 to 2006 in the United States. This company conducted a weekly equity scan survey with 75 samples per week. Then the data was rolled up monthly. All respondents were recruited from a panel from one of the company's lead suppliers. The company tracked the overall brand equity every half year from 2004 to 2006.

***Marketing Mix Elements, Household Penetration, Loyalty and Revenue Premium***

This dataset comes from two commercial sources: Information Resources, Inc. (IRI) and TNS media intelligence. The dataset covers the period from Jan 2004 to Dec 2006. The dataset includes price, sales, distribution, promotion, and advertising for the 11 brands for every 6 months in the U.S. The definitions of these variables are listed below.

**Table 2: Definition of Market Performance Variables and Data Source**

| Definitions of Variables | | |
|---|---|---|
| Variable | Definition | Source |
| Price | Net selling price per unit volume | IRI |
| Brand volume | Volume of the brand sold | IRI |
| Price premium charged | Brand's price – Private label's price | IRI |
| Percentage market share | (Brand's unit volume sold)/(Category's unit volume sold) | IRI |
| Market share premium | Brand's market share – private label's market share | IRI |
| Volume premium | Brand's unit volume – private label's unit volume | IRI |
| Revenue | Unit volume * price | IRI |
| Revenue premium | (Brand's unit volume * brand's net price per unit volume) – ( private label's unit volume * private label's net price per unit volume) | IRI |
| Distribution | ACV | IRI |
| Price promotion | % of brand's dollar sales made on a price promotion | IRI |
| Household penetration | % of all panel households that make at least one purchase in the brand during the 6-month period | IRI |
| Loyalty (Share of Category Requirement) | Each brand's market share among the group of households that bought the brand at least once during the 6-month period | IRI |
| Advertising | Total advertising expenditure (millions of dollars) across 10 media, computed by monitoring advertisements in each medium/program and applying a relevant rate to each advertisement | TNS |

### 3.3 Analysis Techniques

Quantitative data analysis techniques will be employed to test the proposed hypotheses.

Data analysis is divided into four sections:

1) Descriptive analysis of variables

2) Correlation analysis and multiple regressions

3) Stepwise regressions

4) Cross-prediction and validation

***Descriptive Analysis***

This section involves reporting descriptive statistics of variables which will be used in subsequent hypothesis testing. Variables include brand equity measured by customer mind-set and revenue premium, other product-market performance (such as price premium, revenue, and market share premium), household penetration percentage, loyalty (measured by share of category requirement), and marketing mix elements (including advertising expenditure, price, price promotion, and distribution intensity). Descriptive statistics, such as mean, variances and standard deviation, will be reported.

***Correlation Analysis and Multiple Regressions***

Correlation analysis between customer mind-set and product-market performance is used to test for H1 and H2. (H1: customer mind-set and product-market performance measures are positively correlated. H2: brand awareness and product-market performance measures are positively correlated. )

Then, multiple-regressions are employed to investigate whether the impacts of marketing mix elements on customer mind-set measure and product-market performance measure differ. The first set of regressions are used to investigate the differential impact of marketing mix elements on two different brand equity measures, that is, customer mind-set and revenue premium to test hypotheses 3 (H3: The associations of marketing mix

elements with customer mind-set and revenue premium measure are similar). In particular, two multiple-regression analyses will be conducted. One regression will use the customer mind-set measure as the dependent variable; and the other regression will use the revenue premium as the dependent variable. Both regressions use the same group of independent variables, including marketing mix elements, household penetration and loyalty. The purpose of using both customer mind-set and revenue premium brand equity measures as dependent variables in the regression model is to uncover any differences and similarities between the two types of brand equity measures. At the same time, since both the customer mind-set and the revenue premium are supposed to measure the same underlying construct (i.e., brand equity), it is expected that the regression results from the two regression models should be similar. Hence, the use of both customer mind-set measures and revenue premium as dependent variables, also demonstrates the validity and robustness of each measure.

The second set of regressions explores the impact of marketing mix elements on brand awareness, and then compares the results with the results from the previous regression analyses. In particular, brand awareness is the dependent variable of the regression model, and the independent variables are the same as in the first regression analyses. Some differences in the impact of marketing mix elements on brand awareness and overall brand equity are expected. For instance, price promotion is expected to have a positive relation with brand awareness (H4). However, it is expected to have a negative relation with the overall brand equity, either measured in customer mind-set or revenue premium.

*Stepwise Regression & Adstock*

It is expected that the customer mind-set measure is able to capture more cumulative brand-building effects than the product-market performance measure (H5). Thus, stepwise multiple-regression is employed to further explore the relative impact of current factors (marketing mix elements), and the long-term factors (household penetration percentage and loyalty) on brand equity. As per the previous multiple regressions, both customer mind-set brand equity and revenue premium are used as dependent variables respectively. When the customer mind-set measure is used as the dependent variable, long-term factors are expected to be chosen to enter the model earlier than the model with the revenue premium as dependent variable.

In addition to the stepwise regression analysis, another set of two regressions analyses are implemented to explore whether or not customer mind-set measures capture more cumulative brand-building effects. Specifically, customer mind-set and revenue premium measures are used as dependent variables respectively. Independent variables include Adstock, distribution intensity, net price and price promotion. The model estimation is carried out in two steps. First, I pick a value for smoothing constants $\lambda$ and calculate Adstock for all time periods. These advertising measures are then used in estimating the two regression models. Repeating the process with different $\lambda$ values will help me to select the best-fitting model on the basis of the adjusted $R^2$ criteria. I will use $\lambda$ values ranging from 0.0 (the current effects model) to 0.9 in increments of 0.1 and find a smoothing constant which produces the best fit for the customer mind-set and revenue premium respectively. Since the customer mind-set is expected to reflect cumulative

brand-building effects better than the product-market performance measure (in this study, measured as the revenue premium), the $\lambda$ value which yields the best fit for the customer mind-set measure should be larger than the $\lambda$ value producing the best fit for the revenue premium.

***Cross-prediction and Validation***

Cross-prediction is used to test H6: Customer mind-set measures predict product-market performance measures. Specifically, the last time period of the customer mind-set brand equity measure and the revenue premium measure are treated as the holdout sample. Then the customer mind-set brand equity measures of the previous time periods are used to forecast the current revenue premium. And, the revenue premium of the previous time period is utilized to predict the value of the current customer mind-set measures of brand equity. Then, forecast accuracies are compared. It is expected that the forecast accuracy of the customer mind-set is better than that of the revenue premium. The similar analysis procedure will be implemented to test H7: Brand awareness predict product-market performance measures. Table 3 summarizes the analysis techniques and the corresponding hypotheses tested.

**Table 3: Hypotheses and Analysis Techniques**

| Hypotheses | Analysis Techniques |
|---|---|
| H1: Customer mind-set and revenue premium are positively correlated.<br><br>H2: Brand awareness and revenue premium are positively correlated. | Correlation Analysis |
| H3: The associations of marketing mix elements (including advertising, distribution, price and price promotion) with the customer mind-set and revenue premium measure are similar.<br><br>H4: Price promotion is positively related to brand awareness. | Multiple Regression |
| H5: Customer mind-set measures capture more cumulative brand-building effects than product-market performance measures. | Stepwise Regression and Adstock Analysis |
| H6: Customer mind-set measures predict product-market performance measures.<br><br>H7: Brand awareness predicts product-market performance measures. | Cross-Prediction Tests |

## Chapter Summary

In summary, this chapter illustrates the research methodology used to test the hypotheses developed in Chapter 2. Firstly, the variables used in the present research and their respective operationalizations are described. Then, data sources and the method of data collection are presented. Finally, analysis techniques for empirical analysis are presented.

# CHAPTER 4: DATA DESCRIPTION

This chapter provides basic descriptive statistics on variables which will be used in the subsequent analyses. Generally, basic descriptive statistics are reported for four groups of variables: 1) marketing mix elements, including advertising expenditure, distribution intensity, net price and price promotion; 2) private label, including its market share, sales in dollars, net price and distribution intensity; 3) two long-term factors: household penetration percentage and loyalty (measured by share of category requirement); and 4) brand equity measures, including customer mind-set measures, brand awareness, and revenue premium.

## 4.1 Marketing Mix Variables:

This section details the four major marketing mix elements: advertising expenditure, net price, distribution intensity, and price promotion.

Table 4 presents the descriptive statistics related to the advertising expenditure of all 11 brands contained in the data. Overall, great variances are observed as indicated by the standard deviation ($11,209.8). The minimum advertising expenditure is zero; and the maximum advertising expenditure is $48,302,300 every six months. The big difference in advertising expenditure between brands implies that brands adopt different marketing strategies. For consumer packaged goods, some brands may just rely heavily on distribution to obtain brand awareness and generate sales. For instance, Brand E and Brand K did not advertise at all from 2004 to 2006, as seen in the table. However, some

brands have relatively high advertising expenditure, indicating their intention to build brand equity. For example, Brand I has the highest advertising expenditure among the 11 brands, with an average advertising spending of $36, 205, 870 dollars per six months.

**Table 4: Advertising Expenditure: Descriptive Statistics**

| Brand | N | Mean (,000$) | Std Dev (,000$) | Min (,000$) | Max (,000$) | Variance |
|---|---|---|---|---|---|---|
| **Overall** | 66 | 6,252.9 | 11,209.8 | 0 | 48,302.3 | 125,659,429 |
| **A** | 6 | 13,652.83 | 4,518.48 | 7,104.2 | 19,562.0 | 20,416,665 |
| **B** | 6 | 1,848.95 | 1,159.63 | 0 | 3276.4 | 1,344,747 |
| **C** | 6 | 2,490.07 | 4,650.85 | 0 | 11,682.3 | 21,630,455 |
| **D** | 6 | 873.02 | 559.94 | 274 | 1,584.6 | 313,536 |
| **E** | 6 | 0 | 0 | 0 | 0 | 0 |
| **F** | 6 | 10,530.9 | 5,006.91 | 6,747.4 | 20,542.9 | 25,069,164 |
| **G** | 6 | 2,322.72 | 4,389.05 | 30 | 11,227.5 | 19,263,718 |
| **H** | 6 | 242.55 | 594.12 | 0 | 1,455.3 | 352,983 |
| **I** | 6 | 36,205.87 | 10,536.2 | 23,150.9 | 48,302.3 | 111,011,817 |
| **J** | 6 | 615.65 | 1,013.9 | 0 | 2,648.4 | 1,028,063 |
| **K** | 6 | 0 | 0 | 0 | 0 | 0 |

Table 5 indicates the descriptive statistics of the net price of 11 brands in the data set. The minimum price is $0.37 per unit volume; and the highest price is $1.59 per unit volume. The gap between minimum price and maximum price indicates big price differences among different brands. For instance, Brand D has the highest average net price of $1.57 per unit volume; while Brand K's average net price is the lowest among the 11 brands ($0.38 per unit volume). The small standard deviation of each brand indicates that, during the data period (2004 – 2006), brands did not exhibit great variances in terms of their pricing policy.

**Table 5: Net Price: Descriptive Statistics**

| Brand | N | Mean ($/unit volume) | Std Dev | Min | Max | Variance |
|---|---|---|---|---|---|---|
| **Overall** | 66 | 0.90 | 0.32 | 0.37 | 1.59 | 0.10 |
| **A** | 6 | 0.82 | 0.06 | 0.76 | 0.91 | 0.004 |
| **B** | 6 | 0.65 | 0.02 | 0.62 | 0.67 | 0.0004 |
| **C** | 6 | 1.15 | 0.01 | 1.13 | 1.17 | 0.0002 |
| **D** | 6 | 1.57 | 0.02 | 1.53 | 1.59 | 0.00005 |
| **E** | 6 | 0.74 | 0.009 | 0.72 | 0.75 | 0.00009 |
| **F** | 6 | 1.00 | 0.01 | 0.98 | 1.02 | 0.0002 |
| **G** | 6 | 0.56 | 0.02 | 0.54 | 0.59 | 0.0004 |
| **H** | 6 | 0.84 | 0.03 | 0.81 | 0.89 | 0.0009 |
| **I** | 6 | 1.22 | 0.01 | 1.2 | 1.23 | 0.0001 |
| **J** | 6 | 0.97 | 0.06 | 0.93 | 1.1 | 0.004 |
| **K** | 6 | 0.38 | 0.02 | 0.37 | 0.42 | 0.0004 |

Regarding the distribution intensity (measured by ACV percentage) of the dataset, the brands show moderate variances in their distribution intensity (Table 6). The maximum distribution intensity is 99.6%, and the minimum value is 49.4%. Brand K has the smallest distribution intensity, while brand I has always maintained its distribution intensity over 99%. Brand E and H have relatively weak distribution power as their average distribution intensity is less than 70%.

**Table 6: Distribution Intensity: Descriptive Statistics**

| Brand | N | Mean (ACV) | Std Dev | Min | Max | Variance |
|---|---|---|---|---|---|---|
| **Overall** | 66 | 86.21 | 14.29 | 49.4 | 99.6 | 204.47 |
| **A** | 6 | 94.83 | 0.38 | 94.50 | 95.57 | 0.15 |
| **B** | 6 | 91.60 | 1.19 | 89.97 | 92.64 | 1.41 |
| **C** | 6 | 96.68 | 2.31 | 93.4 | 98.68 | 5.33 |
| **D** | 6 | 84.5 | 0.94 | 82.7 | 85.3 | 0.88 |
| **E** | 6 | 63.53 | 9.29 | 49.4 | 74.54 | 86.45 |
| **F** | 6 | 97.60 | 0.54 | 96.9 | 98.1 | 0.29 |
| **G** | 6 | 97.0 | 0.80 | 96.2 | 97.9 | 0.64 |
| **H** | 6 | 68.3 | 7.88 | 59.2 | 77.5 | 62.11 |
| **I** | 6 | 99.5 | 0.04 | 99.4 | 99.5 | 0.001 |
| **J** | 6 | 91.7 | 5.0 | 86.0 | 97.0 | 25.11 |
| **K** | 6 | 63.2 | 5.5 | 56.3 | 71.3 | 30.53 |

Table 7 illustrates the descriptive statistics related to price promotion (measured by the percentage of sales made on price promotion). Overall, all brands implement price promotion, and average percentage of sales made on price promotion is around 11%, indicating price promotion as an important marketing activity for consumer packaged goods. The minimum value is 1.54%, and the maximum value is 19.5%. Brand D offers the least price promotion since its average percentage of sales made on price promotion is only 2.83%, which is much smaller than the average value of the dataset.

**Table 7: Price Promotion (% of sales made on price promotion): Descriptive Statistics**

| Brand | N | Price Promotion (%) | Std Dev | Min | Max | Variance |
|---|---|---|---|---|---|---|
| **Overall** | 66 | 11.27 | 3.80 | 1.54 | 19.50 | 14.41 |
| **A** | 6 | 13.3 | 0.31 | 12.84 | 13.79 | 0.098 |
| **B** | 6 | 15.25 | 1.35 | 13.3 | 16.86 | 1.83 |
| **C** | 6 | 10.17 | 1.07 | 8.99 | 11.95 | 1.15 |
| **D** | 6 | 2.83 | 0.86 | 1.54 | 4.04 | 0.75 |
| **E** | 6 | 9.21 | 1.70 | 7.27 | 11.56 | 2.91 |
| **F** | 6 | 11.95 | 1.40 | 9.88 | 13.63 | 1.97 |
| **G** | 6 | 12.0 | 1.20 | 10.7 | 13.8 | 1.43 |
| **H** | 6 | 17.5 | 2.10 | 13.8 | 19.5 | 4.43 |
| **I** | 6 | 10.56 | 0.84 | 9.6 | 11.6 | 0.70 |
| **J** | 6 | 12.1 | 1.18 | 11.1 | 14.3 | 1.40 |
| **K** | 6 | 9.2 | 0.98 | 8.08 | 10.8 | 0.96 |

I also report the descriptive statistics of dollar sales and market share. Such descriptive statistics may reveal a brand's strength in the market compared to its competitors.

Table 8 and Table 9 represent the descriptive statistics of dollar sales and market share. Altogether, the 11 brands represent 89% market share of the overall market in the U.S. For the overall dataset, the average sales are $136, 604,935 per half year. The standard deviation implies great variances in sales among different brands. Brand I has the highest average sales ($707,201,689 per half year) and market share (42.3%) among the 11 brands; Brand D has the lowest average sales ($23,694,173 per half year) and market share (1.4%). This result confirms the previous descriptive statistics regarding advertising expenditure and distribution intensity. Sales reflect the size as well as the strength of a brand. Therefore, the brand with the biggest market share, such as Brand I, also has higher distribution intensity and advertising expenditure compared to its competitors.

**Table 8: Dollar Sales: Descriptive Statistics**

| Brand | N | Dollar Sales ($) | Std Dev | Min | Max | Variance |
|---|---|---|---|---|---|---|
| **Overall** | 66 | 136,604,935 | 187,108,921 | 17,410,955 | 728,121,000 | 3.50097E16 |
| **A** | 6 | 141,719,350 | 15,669,835.9 | 126,481,300 | 160,760,000 | 2.45544E14 |
| **B** | 6 | 86,747,793.7 | 3,060,825.35 | 83,289,310 | 90,832,250 | 9.36865E12 |
| **C** | 6 | 76,370,909.3 | 11,956,126.2 | 61,870,224 | 89,947,022 | 1.42949E14 |
| **D** | 6 | 23,694,173 | 1,468,310.89 | 21,981,034 | 25,844,172 | 2.15594E12 |
| **E** | 6 | 3,533,475.4 | 6,357,736.4 | 28,938,648 | 44,725,402 | 4.04208E13 |
| **F** | 6 | 155,763,959 | 8,505,711.3 | 145,629,713 | 167,609,980 | 7.23471E13 |
| **G** | 6 | 122,842,567 | 12,114,282.8 | 106,589,040 | 140,503,932 | 1.46756E14 |
| **H** | 6 | 27,319,963.1 | 8,526,100.8 | 17,410,955 | 38,253,012 | 7.26944E13 |
| **I** | 6 | 707,201,689 | 19,682,646.2 | 675,034,202 | 728,121,000 | 3.87407E14 |
| **J** | 6 | 57,233,228.5 | 107,130,37.2 | 42,760,173 | 71,810,782 | 1.14769E14 |
| **K** | 6 | 68,425,892.6 | 9,197,701.9 | 53,439,919 | 76,176,610 | 8.45977E13 |

**Table 9: Market Share in Dollar Sales: Descriptive Statistics**

| Brand | N | Mean (%) | Std Dev | Min | Max | Variance |
|---|---|---|---|---|---|---|
| **Overall** | 66 | 8.12 | 11.2 | 1.04 | 44.30 | 125.2 |
| **A** | 6 | 8.12 | 0.71 | 7.4 | 9.03 | 0.49 |
| **B** | 6 | 5.19 | 0.24 | 4.93 | 5.6 | 0.05 |
| **C** | 6 | 4.56 | 0.65 | 3.8 | 5.3 | 0.41 |
| **D** | 6 | 1.4 | 0.06 | 1.3 | 1.5 | 0.004 |
| **E** | 6 | 2.1 | 0.34 | 1.7 | 2.6 | 0.11 |
| **F** | 6 | 9.29 | 0.54 | 8.8 | 10 | 0.29 |
| **G** | 6 | 7.3 | 0.56 | 6.5 | 8.1 | 0.31 |
| **H** | 6 | 1.6 | 0.48 | 1.04 | 2.2 | 0.24 |
| **I** | 6 | 42.3 | 1.9 | 39.5 | 44.3 | 3.3 |
| **J** | 6 | 3.4 | 0.56 | 2.6 | 4.2 | 0.32 |
| **K** | 6 | 4.1 | 0.5 | 3.3 | 4.5 | 0.25 |

## 4.2 Descriptive Statistics Relating to Private Label

Since the revenue of the private label is used as the benchmark for the revenue premium measure of brand equity, some descriptive statistics on the private label's market share, sales, net price, and distribution are reported.

Table 10 summarizes the descriptive statistics relating to the private label. The average price for the private label is around $0.47 per unit volume with very small variance. Compared to the average net price of the branded product (mean = $0.90), the private label charges a much lower price. However, the private label is not necessarily the lowest priced product in the market. For instance, the net price of Brand K is lower than the private label's average price. Regarding the distribution intensity, the private label is doing quite well with the average ACV percentage around 85%. This figure is higher than the distribution intensity of some brands such as Brand E, K and J. Since the private label is generally the product which carries the retailer's name, the distribution intensity of the private label reflects the retailer's tendency to produce and distribute the private label. The average market share of the private label is around 2.5%, with a minimum value of 2.3% and a maximum value of 2.7%. It is higher than some brands' market share, such as Brand E and K. Additionally examined was whether the private label's market share and sales grew from 2004 to 2006. It was found that the private label's dollar market share grew 19% from 2004 to 2006, and its dollar sales grew 24% during the three years of the data. The whole category grew around 5% in total market dollar sales. Hence, the private label's market position is growing stronger.

**Table 10: Descriptive Statistics Relating to Private Label**

| Variable | Mean | Std. Deviation | Min | Max | Variance |
|---|---|---|---|---|---|
| Net Price ($/unit volume) | 0.47 | 0.009 | 0.46 | 0.49 | 0.00009 |
| Distribution intensity (ACV) | 84.7 | 6.4 | 70.9 | 89.6 | 41.2 |
| Market share in dollar value (%) | 2.5 | 0.14 | 2.3 | 2.7 | 0.02 |
| Sales in dollars | 43,518,711.7 | 3,174,651.3 | 38,755,170 | 48,203,700 | 1.00784E13 |

### 4.3 Household Penetration Percentage & Loyalty

Table 11 illustrates the descriptive statistics of household penetration percentage in the dataset. The overall average household penetration percentage is 13.7%, with standard deviation of 9.17%. Brand D has the lowest average household penetration rate, while Brand I has the highest average household penetration rate at 35.2%. Overall, the variance of penetration rate is small, indicating household penetration rate is a relatively stable measure.

**Table 11: Household Penetration Percentage: Descriptive Analysis**

| Brand | N | Mean (%) | Std Dev | Min | Max | Variance |
|---|---|---|---|---|---|---|
| Overall | 66 | 13.7 | 9.17 | 1.76 | 36.50 | 84.25 |
| A | 6 | 22.32 | 0.18 | 22.14 | 22.48 | 0.03 |
| B | 6 | 14.9 | 0.28 | 14.65 | 15.19 | 0.078 |
| C | 6 | 9.33 | 0.47 | 8.91 | 9.84 | 0.23 |
| D | 6 | 1.89 | 0.17 | 1.76 | 2.20 | 0.03 |
| E | 6 | 6.84 | 0.95 | 6.1 | 8.50 | 0.91 |
| F | 6 | 12.40 | 0.37 | 12.10 | 12.8 | 0.14 |
| G | 6 | 21.4 | 0.63 | 21.1 | 22.7 | 0.40 |
| H | 6 | 4.37 | 0.51 | 4.03 | 5.34 | 0.26 |
| I | 6 | 35.2 | 1.48 | 33.6 | 36.5 | 2.19 |
| J | 6 | 9.61 | 1.1 | 8.6 | 10.9 | 1.2 |
| K | 6 | 12.6 | 0.60 | 12.1 | 13.5 | 0.36 |

The average loyalty of the overall data is around 35% with standard deviation of 9.15 (Table 12). Brand D has the lowest average loyalty at 18.27%; and Brand I has the highest average loyalty at 55.5%. From previous descriptive statistics, it is observed that Brand I is relatively strong among the 11 brands. The relatively small standard deviation of each brand indicates that loyalty (measured by share of category requirement) is also a relatively stable measure.

**Table 12: Loyalty (measured by share of category requirement): Descriptive Statistics**

| Brand | N | Mean (%) | Std Dev | Min | Max | Variance |
|---|---|---|---|---|---|---|
| **Overall** | 66 | 35.60 | 9.15 | 14.81 | 56.27 | 83.71 |
| **A** | 6 | 36.24 | 0.57 | 35.52 | 36.62 | 0.32 |
| **B** | 6 | 32.53 | 0.99 | 31.03 | 33.37 | 0.98 |
| **C** | 6 | 33.47 | 0.71 | 33.13 | 34.9 | 0.51 |
| **D** | 6 | 18.27 | 3.66 | 14.8 | 21.6 | 13.4 |
| **E** | 6 | 38.0 | 2.74 | 34.9 | 41.3 | 7.52 |
| **F** | 6 | 38.84 | 0.65 | 37.5 | 39.1 | 0.42 |
| **G** | 6 | 36.1 | 0.30 | 35.6 | 36.3 | 0.09 |
| **H** | 6 | 40.95 | 1.24 | 38.9 | 42.3 | 1.55 |
| **I** | 6 | 55.5 | 1.11 | 54.1 | 56.3 | 1.24 |
| **J** | 6 | 24.6 | 0.75 | 23.4 | 25.4 | 0.56 |
| **K** | 6 | 35.9 | 1.09 | 33.8 | 36.6 | 1.20 |

### 4.4 Brand Equity Measured by Customer Mind-set & Revenue Premium

This section illustrates the descriptive statistics relating to brand equity measure. In particular, it contains basic statistics of brand awareness, customer mind-set brand equity and revenue premium. Then a comparison of brand rankings between the customer mind-set and the revenue premium measure is conducted for a preliminary assessment of the differences and similarities between the two measures.

### *4.4.1. Descriptive Statistics of Customer Mind-set & Revenue Premium*

Table 13 represents the descriptive statistics of brand awareness. The average brand awareness of the overall dataset is 76%, with a minimum value of 36% and a maximum value of 96%. Brand I has the highest brand awareness at 95%, while Brand K's brand awareness is the lowest (42.2%) among the 11 brands. Interestingly, Brand D, which has the lowest market share and sales, has a moderate brand awareness of 66.7%. The standard deviation of each brand is relatively small (ranging from 2.6% – 0.5%), indicating that brand awareness is also a stable concept. It is unlikely for a brand to increase its brand awareness within a short time.

**Table 13: Brand Awareness: Descriptive Analysis**

| Brand | N | Mean (%) | Std Dev | Min | Max | Variance |
|---|---|---|---|---|---|---|
| **Overall** | 66 | 76 | 13.5 | 38 | 96 | 183.7 |
| **A** | 6 | .72 | 1.97 | 69 | 75 | 3.88 |
| **B** | 6 | 76.8 | 1.3 | 75 | 79 | 1.70 |
| **C** | 6 | 89.17 | 1.47 | 88 | 91 | 2.16 |
| **D** | 6 | 66.7 | 1.63 | 65 | 69 | 2.66 |
| **E** | 6 | 73.2 | 2.22 | 71 | 76 | 4.9 |
| **F** | 6 | 84.5 | 1.05 | 83 | 86 | 1.1 |
| **G** | 6 | 75.5 | 1.4 | 74 | 77 | 1.96 |
| **H** | 6 | 72.6 | 1.9 | 71 | 76 | 3.61 |
| **I** | 6 | 95.5 | 0.54 | 95 | 96 | 0.3 |
| **J** | 6 | 84.2 | 2.2 | 82 | 87 | 4.84 |
| **K** | 6 | 42.2 | 2.6 | 38 | 45 | 6.76 |

Table 14 illustrates the descriptive statistics of brand equity measured by customer mind-set. As noted in the methodology part, the customer mind-set measure is a percentage measure, ranging from 0 – 1. The questionnaire includes 37 statements investigating customers' response to brand feeling, brand performance, brand image, and brand judgment. Each statement is a positive description of the brand or customers' opinions

toward the brand. And respondents are asked to check "yes" if they agree with the statement, and "no" if not. The customer mind-set measure is the average of the percentage ratings of 37 statements. In general, the customer mind-set measure could be interpreted as "what percentage of the respondents has a positive attitude toward the brand."

The overall average customer mind-set measure is around 17%. With the exception of Brand I with the highest average customer mind-set of 49%, and the customer mind-set measures for other brands range from 12% to 22%, implying that customers do not think very positively of the brands within this product category. The second brand following Brand I is Brand A, with a customer mind-set measure of 22%. Brand D has the lowest average customer mind-set of 9%, implying that only 9% of all the respondents who know Brand D think positively of Brand D.

The standard deviation of each brand's measure is relatively small, indicating that customer mind-set is a stable measure. The stability of customer mind-set brand equity issue will be discussed further in the later sections.

**Table 14: Customer Mind-set Measure: Descriptive Statistics**

| Brand | N | Mean | Std Dev | Min | Max | Variance |
|---|---|---|---|---|---|---|
| **Overall** | 66 | 0.174 | 0.108 | 0.075 | 0.508 | 0.012 |
| **A** | 6 | 0.22 | 0.008 | 0.21 | 0.23 | 0.000065 |
| **B** | 6 | 0.13 | 0.009 | 0.13 | 0.15 | 0.000089 |
| **C** | 6 | 0.19 | 0.015 | 0.17 | 0.21 | 0.00024 |
| **D** | 6 | 0.09 | 0.013 | 0.07 | 0.11 | 0.00019 |
| **E** | 6 | 0.11 | 0.0056 | 0.11 | 0.12 | 0.00003 |
| **F** | 6 | 0.17 | 0.006 | 0.16 | 0.17 | 0.00004 |
| **G** | 6 | 0.14 | 0.0099 | 0.13 | 0.15 | 0.000098 |
| **H** | 6 | 0.098 | 0.01 | 0.08 | 0.11 | 0.00014 |
| **I** | 6 | 0.49 | 0.01 | 0.47 | 0.51 | 0.0002 |
| **J** | 6 | 0.15 | 0.017 | 0.13 | 0.17 | 0.0003 |
| **K** | 6 | 0.12 | 0.009 | 0.11 | 0.14 | 0.00088 |

Table 15 illustrates the descriptive statistics of revenue premium of the current dataset. Because revenue premium is measured by the difference between branded products' revenue and the private label's revenue, negative figures are likely to appear if some branded products' revenue is smaller than that of the private label. Essentially, the private label here serves as the benchmark for comparison.

Overall, the average revenue premium is $109,924,686 per half year. However, the big gap between the minimum value ($-28,529,375) and maximum value ($796,965,773) indicates the great variances in revenue premium among the 11 brands. Brand I has the highest average revenue premium among all the brands. Brand D has the lowest average revenue premium among all the brands, which is $-20,397,169. Brand E and H also have negative average revenue premium. However, it would be premature to conclude that Brand D's equity is very low. Along the same lines, negative revenue premium of several brands also suggests the interpretation difficulty of this measure. Since the revenue premium is a brand equity measure based on benchmarking, it is safer to interpret that

Brand D's brand equity measured by the revenue premium is smaller than the private label.

**Table 15: Revenue Premium: Descriptive Analysis**

| Brand | N | Mean($) | Std Dev | Min | Max | Variance |
|---|---|---|---|---|---|---|
| **Overall** | **66** | 109,924,686 | 213,420,245 | -28,529,375 | 796,965,773 | 4.55482E16 |
| **A** | 6 | 112,522,814 | 13,797,672.4 | 99,982,075 | 131,238,198 | 1.90376E14 |
| **B** | 6 | 60,086,231.5 | 5,320,051.91 | 51,969,694 | 68,738,885 | 2.8303E13 |
| **C** | 6 | 37,161,336.9 | 14,590,996.2 | 19,168,828 | 54,013,375 | 2.12897E14 |
| **D** | 6 | -20,397,169 | 3,418,534.11 | -24,501,761 | -15,247,371 | 1.16864E13 |
| **E** | 6 | -3,290,253.6 | 9,397,404.72 | -12,874,332 | 10,767,161 | 8.83112E13 |
| **F** | 6 | 127,381,179 | 9,000,893.8 | 112,465,801 | 139,347,859 | 8.10161E13 |
| **G** | 6 | 94,458,630.9 | 19,610,255.4 | 70,042,658 | 124,012,119 | 3.84562E14 |
| **H** | 6 | -15,036,559 | 11,633,495.7 | -28,529,375 | 583,963 | 1.35338E14 |
| **I** | 6 | 761,316,580 | 24,062,640.9 | 727,482,442 | 796,965,773 | 5.79011E14 |
| **J** | 6 | 22,166,280.6 | 14,943,633.5 | 3,104,996 | 43,597,098 | 2.23312E14 |
| **K** | 6 | 32,802,476.1 | 11,997,680.4 | 13,043,805 | 43,399,962 | 1.43944E14 |

### *4.4.2. Ranking Comparison between Customer Mind-set & Revenue Premium*

Table 16 contains rankings of brands using the two brand equity measures of customer mind-set and revenue premium. The comparison of ranking between the two brand equity measures preliminarily uncovers the difference between the two measures. Some similarities and discrepancies are observed between the customer mind-set ranking and the revenue premium ranking. Brand I is ranked as the top one in both customer mind-set and revenue premium measures, indicating strongest brand equity among the 11 brands.

Brand D is relatively weak among all the brands, as indicated by its 11th ranking by both customer mind-set and revenue premium measures.

However, some discrepancies are also observed. For instance, Brand C is ranked as the third brand in terms of customer mind-set. But, its revenue premium is ranked as the sixth among the 11 brands. As discussed in the marketing mix elements section, Brand C has a relatively high price, suggesting that it may target a small segment within this specific product category. Therefore, it is possible for Brand C to have high customer mind-set ratings but relatively low revenue premium. The differences in rankings of the two types of measures indicate the underlying differences between them. Customer mind-set reflects the general opinion of consumers towards a brand, and revenue premium reflects the brand's performance in the market. Some premium brands may enjoy high brand equity in the customer's mind, but not high revenue. And a brand with a high revenue premium might not necessarily have a positive opinion in the customer's mind. For instance, Brand B is ranked as the fifth brand in terms of revenue premium, but its ranking in customer mind-set is seventh among the 11 brands. This ranking comparison demonstrates the need to further explore the theoretical differences and relationship between the two brand equity measures: customer mind-set and revenue premium.

**Table 16: Comparison of the Ranking of Different Measures**

| Brand | Rank of Customer Mind-set Measures | Rank of Revenue Premium |
|---|---|---|
| A | 2 | 3 |
| B | 7 | 5 |
| C | 3 | 6 |
| D | 11 | 11 |
| E | 9 | 9 |
| F | 4 | 2 |
| G | 6 | 4 |
| H | 10 | 10 |
| I | 1 | 1 |
| J | 5 | 8 |
| K | 8 | 7 |

## Chapter Summary

This chapter provides basic descriptive statistics of the variables such as advertising expenditure, the customer mind-set and the revenue premium in our dataset. In particular, for the overall dataset, great variations are found in advertising expenditure, the revenue premium, customer mind-set and brand awareness across the 11 brands. However, for each brand, the measures of customer mind-set, revenue premium and brand awareness do not change drastically from the previous time period to the next time period, implying the stability of those measures. Finally, a comparison of the rankings in the customer mind-set measure and the revenue premium suggests differences between the two measures. And this topic will be further explored in the following chapter (Chapter 5).

# CHAPTER 5: HYPOTHESIS TEST

In this chapter, hypotheses proposed in literature review section are to be tested. Specifically, this chapter starts with the analysis of the brand equity trend over time. Then, correlation analyses of different brand equity measures are conducted to test whether customer mind-set measures and product-market performance measures are positively correlated. Thirdly, the associations of marketing activities with different brand equity measures are explored. Next, the effects of long term factors which reflect the cumulative brand-building effects are examined. Finally, cross-prediction tests are implemented to test whether customer mind-set measures predict product-market performance measures.

## 5.1 Change in Brand Equity Measures over Time

In this section, the trends of brand equity measures (including brand awareness, customer mind-set measure and revenue premium) are explored. Firstly, I investigated the stability of the brand equity measures. Then, the brand equity's trends over the time period covered by our dataset are examined.

In order to explore the stability of the two brand equity measures, correlations of brand equity measures with their lagged value are analyzed. Brand equity is a stable concept. Therefore, it is unlikely to vary drastically from time to time (Aaker, 1991; Farquhar, 1989). Hence, a good brand equity measure is supposed to be stable over time (Ailawadi et al., 2003).

The correlation results of customer mind-set measure and revenue premium measure with their respective lagged values demonstrate that both measures are stable. The correlation of brand awareness with its lagged value is 0.98 ($p<.0001$). The correlation of customer mind-set brand equity measure with its lagged value in the data is 0.99 ($p<.0001$). The correlation of revenue premium with its lagged value in the dataset is 0.99 ($p<.0001$). The high correlations demonstrate the measures' stability.

In addition to checking the stability of brand equity in the data set, the trend of brand equity measure is also explored. In particular, two analyses are conducted. Firstly, correlation analysis between the brand equity measures (including brand awareness, customer mind-set and revenue premium) and time is conducted both at the aggregate level and the individual brand level. Then the specific percentage change of brand equity measures is investigated for each brand respectively. And the median change in brand equity of the 11 brands is calculated. Finally, a correlation analysis between brand equity measures and market share of private labels is conducted with the purpose to check whether the growth of private labels has a negative association with the national brands' equity.

**Table 17: Correlation of Brand Equity Measures with Time**

| Brand | Correlation of Customer Mind-set with Time | Correlation of Revenue Premium with Time | Correlation of Brand Awareness with Time |
|---|---|---|---|
| **All Brands in Dataset** | -0.05 | -0.021 | 0 |
| **A** | 0.74 | 0.92** | 0.33 |
| **B** | -0.76 | -0.53 | 0.12 |
| **C** | -0.85* | -0.98 ** | -0.76 |
| **D** | -0.51 | -0.94** | 0.77 |
| **E** | -0.61 | -0.97** | -0.64 |
| **F** | 0.67 | 0.29 | 0.15 |
| **G** | 0.006 | -0.97** | 0.66 |
| **H** | -0.88* | -0.99** | -0.82* |
| **I** | -0.44 | 0.70 | -0.29 |
| **J** | -0.95** | -0.97** | -0.60 |
| **K** | -0.75 | -0.91* | 0.95* |

*, $p < .05$
**, $p < .01$
***, $p<.0001$

**Table 18: Percentage Change in Brand Equity Measures (Brand Level)**

| Brand | Percentage Change in Customer Mind-set (%) | Percentage Change in Revenue Premium (%) | Percentage Change in Brand Awareness (%) |
|---|---|---|---|
| **A** | 3 | 27 | 4 |
| **B** | -16 | -13 | 0 |
| **C** | -16 | -64 | -3 |
| **D** | -17 | -61 | 6 |
| **E** | -6 | -219 | -5 |
| **F** | 8 | 4 | 1 |
| **G** | -9 | -44 | 3 |
| **H** | -18 | -49 | -7 |
| **I** | -2 | 6 | 0 |
| **J** | -23 | -93 | -5 |
| **K** | -11 | -70 | 18 |
| **Median of Percentage Change in Brand Equity Measure** | -11 | -49 | 0 |

Regarding the overall data set, the brand equity is not found to have significant correlation with time. However, a close examination of the relationship between brand

equity and time for each brand reveals overall erosions in brand equity for this product category. Table 17 indicates that the brand equity measured in customer mind-set of three brands (C, H, J) is decreasing with time. For instance, the customer mind-set measure is negatively correlated with time for Brand C ($r = -0.85$, $p<.05$). Regarding the revenue premium measures, seven brands (out of the 11 brands in the dataset) demonstrate erosions in revenue premium from 2004 to 2006. The revenue premium of Brand C is negatively correlated with time, with r value of -0.98 ($p <.01$). Only Brand A indicates an increase over time in brand equity measured in revenue premium.

Table 18 illustrates the percentage change in brand equity measures for the overall dataset and 11 brands respectively. The median percentage loss in customer mind-set across the 11 brands in our sample is 11% over the three years. And the median percentage loss in revenue premium across the 11 brands in our sample is 49%, much larger than the loss in customer mind-set. Figure 1 to Figure 22 in the appendix illustrate the trend in brand equity, measured by customer mind-set and revenue premium for each brand.

Table 19 illustrates the correlation of brand equity measures with the market share of the private label. The customer mind-set values of C, H and J are negatively correlated with the market share of the private label. For instance, the correlation of the customer mind-set of Brand C with the private label's market share is -0.96 ($p <.01$).

The revenue premium measures of seven brands (including Brand C, E, F, G, H, J and K) are negatively correlated with the private label's market share. For example, the revenue premium of Brand C is negatively correlated with the market share of the private label, with the r value of -0.94 ($p<.01$). Interestingly, a comparison of Table 19 and Table 20 reveals that the brands whose brand equity decreased from 2004 to 2006 are the same brands whose brand equity are negatively correlated with the market share of the private label. At the same time, the private label's market share increased by 19% and the dollar sales increased by 24% from 2004 to 2006. The erosions of brand equity are accompanied by the growth of private label.

Among the 11 brands, only Brand A illustrates an increase in revenue premium from 2004 to 2006. Its revenue premium is positively correlated with time. The reasons underlying the increase in revenue premium of Brand A could be the introduction of a series of new products since 2005. And this group of products is positioned as premium brands in this market which generated an increase in sales for Brand A.

Brand awareness does not appear to exhibit trend over time at the aggregate level. Only the brand awareness of Brand H is found to have a negative correlation with time, with the r value of -0.82 ($p<.05$). Brand H's distribution intensity has been decreasing from 77% to 59% from 2004 to 2006, which may contribute to the decrease of its brand awareness. Interestingly, although experienced erosions in brand equity, Brand K is found to have had an increase in brand awareness over the three years. The reasons could

be that Brand K increased its promotion investment. As promotion generates product experience, brand awareness could be enhanced because of the product usage experience.

**Table 19: Correlation of Brand Equity Measures with Market Share of Private Label**

| Brand | Customer Mind-set | Revenue Premium | Brand Awareness |
|---|---|---|---|
| All Brands in Dataset | -0.038 | -0.022 | -0.02 |
| A | 0.81 | 0.86* | 0 |
| B | -0.68 | -0.60 | -0.14 |
| C | -0.96** | -0.94** | -0.87* |
| D | -0.29 | -0.89* | 0.45 |
| E | -0.53 | -0.89* | -0.74 |
| F | 0.73 | 0.008 | -0.17 |
| G | 0.22 | -0.87* | 0.39 |
| H | -0.85* | -0.92** | -0.74 |
| I | -0.25 | 0.4 | -0.33 |
| J | -0.89* | -0.91* | -0.74 |
| K | -0.56 | -0.80* | 0.76 |

*, $p < .05$
**, $p < .01$
***, $p<.0001$

## 5.2 Relationship between Customer Mind-set and Product-market Performance Measures

In the literature review section, it is hypothesized that customer mind-set measures and product-market performance measures should be positively correlated (H1). Correlation analysis between customer mind-set and product-market performance measures would reveal whether the two types of measures are measuring the same underlying construct: brand equity. Furthermore, the positive correlation between the two measures also lends support to the validity of the brand equity measures (Ailawadi et al., 2003).

In addition to customer mind-set brand equity and revenue premium, brand awareness, price premium (Bello & Holbrook, 1995; Holbrook, 1992), volume premium, market share, and market share premium are also included in the correlation analyses. It is expected that brand equity will also be reflected in other product-market performance measures (Ailawadi et al., 2003).

Table 20 summarizes the correlations of customer mind-set measures with other product-market performance measures. Three results are particularly noted. First, the high correlation 0.97 ($p<.0001$) of revenue premium and customer mind-set measure demonstrates that the two measures are converging, hence, measuring the same underlying constructs. Therefore, hypothesis 1 (H1: Customer mind-set and revenue premium are positively correlated) is supported.

Second, the correlation of brand awareness with the customer mind-set measure and the revenue premium are moderately high, indicating the importance of brand awareness in building brand equity and generating sales, supporting hypothesis 2 (H2: Brand awareness and revenue premium are positively correlated). This result is different from the findings in the work by Silverman et al. (1999). In their paper, the correlation between familiarity and brand value is not significant. However, in their study, brand equity is measured by the annual Brand Value estimates provided by Financial World. Brands chosen by Financial World are generally corporate brands such as Shell, GE or Cisco, which enjoy very high brand awareness. However, such high corporate brand awareness does not necessarily translate directly into sales. For instance, respondents

who are familiar with Cisco are not necessarily the customers of Cisco. Therefore, the familiarity measure in Silverman et al.'s (1999) work might not offer much insight into the relationship between brand awareness and brand equity.

Third, the correlation of price premium with customer mind-set is low ($r = 0.284$), yet significant. In addition, price premium is positively correlated to other product-market performance measures such as revenue premium, market share, and share premium. The results are different from the findings in Ailwadi et al. (2003), where they find zero correlation between price premium and revenue premium in both local market dataset, as well as national market dataset. Different from the work of Ailawadi et al. (2003), the dataset of this study comes from one product category; while the work of Ailawadi et al. (2003) included 17 product categories. It is conceivable that some significant findings were washed out in data aggregation in their study. Our findings demonstrate that price premium, at least for this specific product category, does reveal some information about brand equity. The positive correlation of price premium with customer-mind set measure illustrates that high priced products are likely to enjoy high brand equity. And the positive correlation of price premium with revenue premium also suggests that high price products are likely to perform well in the market.

Finally, in this current data set, market share is also highly correlated with revenue premium and customer mind-set measures and the correlation is higher than those found in the work by Ailwadi et al. (2003). Such high correlation might also be due to relative homogeneity of our dataset where all brands come from the same product category.

In sum, the results of the correlation analysis support hypothesis 5: customer mind-set measures and product-market performance measures are positively correlated. In addition, such positive correlation also demonstrates the validity of the customer mind-set and revenue premium measures.

**Table 20: Correlation of Customer Mind-set Measures and Other Product-market Performance Measures**

| | Customer Mind-set | Brand Awareness | Price Premium | Volume Premium | Revenue Premium | Market Share | Share Premium | Revenue |
|---|---|---|---|---|---|---|---|---|
| **Customer Mind-set Brand Equity** | 1.0 | | | | | | | |
| **Brand Awareness** | 0.562 *** | 1.0 | | | | | | |
| **Price Premium** | 0.284 * | 0.49* | 1.0 | | | | | |
| **Volume Premium** | 0.903*** | 0.33** | 0.006 | 1.0 | | | | |
| **Revenue Premium** | 0.967*** | 0.502*** | 0.24* | 0.956*** | 1.0 | | | |
| **Market Share** | 0.96*** | 0.504*** | 0.24* | 0.954*** | 0.99*** | 1.0 | | |
| **Share Premium** | 0.966*** | 0.504*** | 0.24* | 0.954*** | 0.99*** | 0.99*** | 1.0 | |
| **Revenue** | 0.974*** | 0.528*** | 0.25* | 0.952*** | 0.99*** | 0.99*** | 0.99*** | 1.0 |

*, $p < .05$
**, $p < .01$
***, $p<.0001$

I will further discuss the differences and relationship between the customer mind-set and the revenue premium measure of brand equity in the following empirical analysis sections.

## 5.3 Impact of Marketing Mix Elements on Different Measures

The following analyses investigate the impact of marketing mix elements on three types of brand equity measures, namely, brand awareness, customer mind-set and revenue premium. The purpose is to explore whether the effect of marketing mix elements are different on varying brand equity measures. In particular, the analyses will be conducted in two steps. Firstly, the correlations among independent variables are analyzed in order to identify any possible multicollinearity problems. Then, multiple regressions are utilized to explore the effect of marketing mix elements on brand equity measures. Hypothesis three and four are tested respectively (H3: The associations of marketing mix elements with customer mind-set and revenue premium measure are similar; and H4: Price promotion is positively related to brand awareness).

### *5.3.1 Correlation Analysis among Marketing Mix Elements, Penetration and Loyalty*

I conduct correlation analysis among the independent variables in order to identify any possible multicollinearity problem. As illustrated by Table 21, advertising expenditure is highly correlated with penetration and loyalty, with the Pearson correlation value of 0.78 ($p<.0001$), and 0.66 ($p<.0001$) respectively. It is important to notice these strong correlations while analyzing relationships among variables in the model as multicollinearity is likely to affect the results.

**Table 21: Major Pearson Correlations**

| | Advertising Expenditure | Distribution Intensity | Net Price | Price Promotion | Penetration | Loyalty |
|---|---|---|---|---|---|---|
| **Advertising Expenditure** | 1.0 | | | | | |
| **Distribution Intensity** | 0.45** | 1.0 | | | | |
| **Net Price** | 0.29* | 035** | 1.0 | | | |
| **Price Promotion** | -0.03 | 0.07 | -0.48*** | 1.0 | | |
| **Penetration** | 0.78*** | 0.53*** | -0.12 | 0.19 | 1.0 | |
| **Loyalty** | 0.66*** | 0.03 | -0.21 | 0.38** | 0.67*** | 1.0 |

*, $p < .05$
**, $p < .01$
***, $p<.0001$

### *5.3.2 Impact of Marketing Mix Elements on Customer Mind-set, Revenue Premium, and Brand Awareness*

In this section, regression analysis is conducted to investigate whether the impact of marketing mix on customer mind-set measure, brand awareness and revenue premium are different. The impact of marketing mix on both customer mind-set and revenue premium is expected to be similar. That is, advertising, distribution and price are positively related to both customer mind-set and revenue premium. And price promotion has negative relationship with both measures. However, price promotion should be positively associated with brand awareness.

In the analysis, the impact of marketing mix elements and long-term factors (including household penetration percentage and loyalty) on brand equity measures is examined by estimating the following regressions respectively:

$$CusotmerMindset_{it} = \alpha_0 + \alpha_1 Ad_{it} + \alpha_2 Dist_{it} + \alpha_3 P_{it} + \alpha_4 \Pr om_{it} + \alpha_5 Ptr_{it} + \alpha_6 Loy_{it} + \alpha_7 T \quad (6)$$

$$\text{Re}venue\,\Pr emium_{it} = \beta_0 + \beta_1 Ad_{it} + \beta_2 Dist_{it} + \beta_3 P_{it} + \beta_4 \Pr om_{it} + \beta_5 Ptr_{it} + \beta_6 Loy_{it} + \beta_7 T \quad (7)$$

$$BrandAwareness_{it} = \delta_0 + \delta_1 Ad_{it} + \delta_2 Dist_{it} + \delta_3 P_{it} + \delta_4 \Pr om_{it} + \delta_5 Ptr_{it} + \delta_6 Loy_{it} + \delta_7 T \quad (8)$$

Where,

$Ad_{it}$: advertising expenditure of brand i at time t;

$Dist_{it}$: % ACV of brand i at time t;

$P_{it}$: regular price of brand i at time t;

$\Pr om_{it}$: percentage of sales made on price promotion of brand i at time t;

$Ptr_{it}$: percentage of household penetration of brand i at time t;

$Loy_{it}$: share of category requirement of brand i at time t;

$T$: time.

In equation (6), the customer mind-set brand equity of brand i in time t is a function of its advertising expenditure, distribution intensity (ACV), regular price, percentage of sales made on price promotion, household penetration percentage, loyalty, and time. In equation (7), the revenue premium of brand i in time t is a function of its advertising expenditure, distribution intensity (ACV), regular price, percentage of sales made on price promotion, household penetration percentage, loyalty, and time. In equation (7), the brand awareness of brand i in time t is a function of its advertising expenditure, distribution intensity (ACV), regular price, percentage of sales made on price promotion, household penetration percentage, loyalty, and time.

Because the data set includes 6 time periods, it is not time-series data in the strict sense. So, brand equity of the previous time period is not included in the model. Time variable is modeled in order to capture time effects if any time trend is present.

**Table 22: Regression of Customer Mind-set Measure, Revenue Premium and Brand Awareness on Marketing Mix Elements, Penetration Rate and Loyalty**

| | **Customer Mind-set** | | **Revenue Premium** | | **Brand Awareness** | |
|---|---|---|---|---|---|---|
| | *R –Square = 0.94* | | *R-square= 0.94* | | *R-square=0.77* | |
| | *F = 127.32 (p<.0001, d.f. = 7)* | | *F = 144.70 (p<.0001, d.f. = 7)* | | *F=29.06 (p<.0001, d.f. = 7)* | |
| | *Regression Coefficient* | | *Regression Coefficient* | | *Regression Coefficient* | |
| **Independent Variables** | **Unstandardized** | **Standardized** | **Unstandardized** | **Standardized** | **Unstandardized** | **Standardized** |
| | | | | | | |
| ***Intercept*** ( $\alpha_0, \beta_0, \delta_0$ ) | -0.11 * (0.043) | 0 | -368,804,174 (81,555,958) *** | 0 | -0.35** (0.11) | 0 |
| ***Advertising Expenditure*** ( $\alpha_1, \beta_1, \delta_1$ ) | 8.289121E-7 (7.72200E-7) | -0.086 | 1,881.50 (1,439.19) | 0.098 | -0.000002 (0.000002) | -0.14 |
| ***Distribution*** ( $\alpha_2, \beta_2, \delta_2$ ) | -0.0007 (0.0004) | -0.10 | -2,330,984 (879,895)* | -0.16 | 0007*** (0.001) | 0.71 |
| ***Price*** ( $\alpha_3, \beta_3, \delta_3$ ) | 0.15 *** (0.02) | 0.45 | 272,500,698 ( 40,339,187)*** | 0.41 | 0.20** (0.05) | 0.47 |
| ***Price Promotion*** ( $\alpha_4, \beta_4, \delta_4$ ) | 0.0003 ( 0.001) | 0.10 | -1,644,800** ( 2,466,749) | -0.03 | 0.008** (0.003) | 0.22 |
| ***Penetration*** ( $\alpha_5, \beta_5, \delta_5$ ) | 0.008 *** (0.001) | 0.71 | 16,668,407*** (2,056,332) | 0.72 | -0.004 (0.003) | -0.28 |
| ***Loyalty*** ( $\alpha_6, \beta_6, \delta_6$ ) | 0.003 ** (0.0007) | 0.26 | 6,789,452*** ( 1,426,808) | 0.29 | 0.009*** (0.002) | 0.58 |
| ***Time*** ( $\alpha_7, \beta_7, \delta_7$ ) | -0.005 * (0.002) | -0.083 | -8,314,937* (3,936,277) | -0.07 | 0.004 (0.005) | 0.06 |

*$p < .05$
**$p < .01$
*** $p < .0001$
***Notes: The standard errors are in parentheses; d.f. = degrees of freedom***

***Customer Mind-set vs. Revenue Premium:*** Table 22 presents the analysis results. For equation (6) in which the customer mind-set brand equity measurement is used as the dependent variable, the R-square value is 0.94 indicating a good fit of the model. Price is found to have a positive relationship with customer mind-set brand equity, with the regression coefficient of 0.15 ($p<.0001$). However, no significant relationship is found between advertising, distribution, price promotion and the customer mind-set brand equity. Penetration and loyalty are found to have a positive relationship with the customer mind-set brand equity, with the estimated coefficient of 0.008 ($p<.0001$), and 0.003 ($p = 0.002$) respectively.

For equation (7) in which revenue premium is used as the dependent variable, the R-square value is 0.94, suggesting a good model fit. As indicated by the table, distribution has a significant negative association with revenue premium, with the regression coefficient of -2,330,984 ($p = 0.01$). Price is positively related to revenue premium, with estimated coefficient of 272, 500, 698 ($p<.0001$). Similar to the results of equation (1), penetration and loyalty also are found to have a positive relation to revenue premium.

In general, the analysis results of both regression models (equation 6 and equation 7) are inconsistent with our expectations based on the literature review. For instance, advertising is not found to have significant positive impact on brand equity. Secondly, the analysis results from two models are not consistent. Distribution is expected to be positively associated to brand equity, however, it is found to be negatively related to

revenue premium. And for the equation in which customer mind-set is used as the dependent variable, distribution is found to have no significant impact on brand equity.

The possible reason underlying such inconsistent results could be the multicollinearity problem among variables. A careful examination of the correlation table (Table 21) reveals that penetration is highly correlated to both distribution ($r = 0.78$, $p<.0001$) and advertising ($r = 0.53$, $p <.0001$). Hence, penetration is taken out from both equations (6) and (7) since it causes the multicollinearity problem and could be a redundant measurement. Then, the regression analysis is re-conducted. The results are presented in the following table (Table 23).

**Table 23: Regression of Customer Mind-set Measure, Revenue Premium and Brand Awareness on Marketing Mix Elements and Loyalty**

| | **Customer mind-set** | | **Revenue Premium** | | **Brand Awareness** | |
|---|---|---|---|---|---|---|
| | *R-square = 0.88* | | *R –square = 0.88* | | *R-square=0.76* | |
| | *F= 71.38.32 (p<..0001,d.f. =6)* | | *F = 75.29 (p< .0001,d.f. =6)* | | *F=31.51 (p<.0001,d.f.=6)* | |
| | Regression Coefficient | | Regression Coefficient | | Regression Coefficient | |
| **Independent Variables** | **Unstandardized** | **Standardized** | **Unstandardized** | **Standardized** | **Unstandardized** | **Standardized** |
| | | | | | | |
| *Intercept*( $\alpha_0, \beta_0, \delta_0$) | -0.17 (0.06)** | 0 | -501,256,881 (115,698,427)*** | 0 | -0.31** (0.11) | 0 |
| *Advertising Expenditure*( $\alpha_1, \beta_1, \delta_1$) | 0.000004 (8.396678E-7)*** | 0.47 | 9,195.04 (1,623.58)*** | 0.48 | -0.000004 * (0.000001) | -0.29 |
| *Distribution*( $\alpha_2, \beta_2, \delta_2$) | 0.002 (0.0005) ** | 0.24 | 2,801,061** (884,784) | 0.19 | 0.005*** (0.0008) | 0.57 |
| *Price*( $\alpha_3, \beta_3, \delta_3$) | 0.03 (0.021) | 0.09 | 37,180,381 (40,555,991) | 0.056 | 0.26*** (0.036) | 0.61 |
| *Price Promotion*( $\alpha_4, \beta_4, \delta_4$) | -0.004 (0.002)** | -0.13 | -9,790,280 (3,262,039) ** | -0.17 | 0.010 ** (0.003) | 0.27 |
| *Loyalty*( $\alpha_6, \beta_6, \delta_6$) | 0.005 (0.0009)*** | 0.46 | 11,389,161 (1,895,596) *** | 0.49 | 0.008*** (0.002) | 0.51 |
| *Time*( $\alpha_7, \beta_7, \delta_7$) | -0.0034 (0.003) | -0.05 | -4,659,526 (5,662,200) | -0.04 | 0.004 (0.005) | 0.05 |

*$p < .10$
**$p< .05$
*** $p < .0001$
***Notes: The standard errors are in parentheses; d.f. = degrees of freedom***

For the regression model in which customer mind-set is used as the dependent variable, the R square is around 0.88 indicating a good model fit. Advertising has a positive impact on brand equity, with an estimated regression coefficient of 0.00004 (p <.0001). Distribution is positively associated to brand equity, with the estimated regression coefficient of 0.002 (p<.01). Price promotion has a negative influence on customer mind-set. Its regression coefficient is -0.004 (p<.01).

For the regression model in which revenue premium is the dependent variable, R square is around 0.88. Both advertising and distribution are demonstrated to have a significant positive relationship on revenue premium, with the regression coefficient of 9,195 ($p<.0001$) and 2,801,61 ($p<.01$) respectively. Price promotion is found to have a negative association with revenue premium.

Comparison of the standardized coefficient of advertising expenditure illustrates advertising as the most important tool to establish brand equity. This result also confirms the findings of other researchers (e.g. Ailawadi et al., 2003; Yoo et al., 2000). Distribution also has a positive impact on brand equity, confirming the results found by Yoo et al. (2000). In our study, price promotion is negatively associated with both measures, indicating erosion in brand equity if the brand offers too much promotion. This finding confirms the results found by Yoo et al. (2000), but it is different from the results in the work of Ailawadi et al. (2003). In the work of Ailawadi et al. (2003), the impact of price promotion on revenue premium is explored. And the authors found the coefficient of price promotion insignificant. They explained that price promotion mainly serves to increases market penetration and has little effect on brand loyalty (Ailawadi et al., 2003, p. 12). However, in the present study, price promotion has a negative impact on both customer mind-set and revenue premium. Price promotion's impact on brand equity deserves further study.

Finally, price is found to have no significant association with the two measures in the model estimation. Since price is negatively correlated to price promotion ($r = -0.48$, $p < .0001$), multicollinearity may be the reason for the absence of any significant effect. I took price promotion out of the model and re-ran the two regression analyses. For both models, price is found to be positively related to brand equity, either measured in customer mind-set or revenue premium, indicating that the higher the price of the brand, the higher the brand equity.

In summary, the regression results of the two models support our expectations. First, the effects of marketing mix elements on customer mind-set and revenue premium are similar. This result further confirms that the two measures are assessing the same underlying construct: brand equity. Hence, hypothesis 3 is supported. Secondly, the signs of estimated regression coefficient of advertising, distribution and price promotion also support our expectations. That is, advertising, and distribution are positively associated with brand equity. Price promotion is negatively related to brand equity.

***Brand Awareness vs. Customer Mind-set & Revenue Premium:*** Table 23 illustrates the regression analysis results regarding the impact of marketing mix elements on brand awareness. Distribution and price are positively related to brand awareness, such as the effects of distribution and price on overall brand equity as assessed by customer mind-set. Contrary to the results of customer mind-set, price promotion is demonstrated to be positively associated with brand awareness, which supports our expectations. Price promotion increases the customer's brand experience. Thus, it has a positive impact on

brand awareness. The results indicate that advertising is negatively related to brand equity. Since advertising is highly correlated with loyalty (r = 0.68, p<.0001), the collinearity issue may be the cause of the negative regression coefficient estimates of advertising. In order to test the effects of advertising of brand awareness, I took the variable "loyalty" out of the regression model, and re-ran the regression analysis. The results are represented in Table 24.

**Table 24: Regression of Brand Awareness on Marketing Mix Elements**

| | **Brand Awareness as Dependent Variable** | |
|---|---|---|
| | *R-square = 0.68* | |
| | *F= 26.22 (p< .0001, d.f. =5)* | |
| | Regression Coefficient | |
| **Independent Variables** | **Unstandardized** | **Standardized** |
| | | |
| ***Intercept*** | 0.026<br>(0.08) | 0 |
| ***Advertising Expenditure*** | 0.000002 (9.99E-7) | 0.13 |
| ***Distribution*** | 0.004 (0.0008)*** | 0.43 |
| ***Price*** | 0.21 (0.04)*** | 0.50 |
| ***Price Promotion*** | 0.01(0.003)*** | 0.42 |
| ***Time*** | 0.004 (0.005) | 0.05 |

*$p < .05$
**$p< .01$
*** $p < .0001$
***Notes: The standard errors are in parentheses; d.f. = degrees of freedom***

The analysis found that distribution is positively related to brand awareness, with an estimated regression coefficient of 0.004 (p<.0001), confirming the belief that the wider the brand's distribution, the higher its brand awareness. Price is also found to have positive association with brand awareness, with an estimated regression coefficient of 0.50 (p<.0001). This result suggests that, in this product category, brands with a

relatively higher price are more widely known or recognized by consumers than those brands with a relatively lower price. In addition, higher priced brands may also allocate more expenses in advertising. Hence, they are likely to enjoy higher brand awareness. Finally, price promotion also contributes to brand awareness with an estimated coefficient of 0.21 ($p<.0001$), supporting hypothesis 4. Interestingly, the relationship between advertising and brand awareness is found to be insignificant. As the product category of our dataset is a quite mature market, increasing advertising may have little effect in increasing brand awareness. Generally, the market share leaders have higher advertising expenditure. However, for the market share leaders, the effect of advertising is diminishing unless their advertising provides some unique/new information of products, such as new product development. Therefore, the advertising's effect on brand awareness is not prominent in this current dataset.

In sum, the results reveal that the effects of marketing mix elements on customer mind-set and revenue premium are similar, supporting hypothesis 3. Advertising, price and distribution are positively related to both customer mind-set and revenue premium. Price promotion has a negative association with both customer mind-set and revenue premium measure. On the other hand, the effects of marketing mix elements on brand awareness are different from the overall brand equity assessment. In particular, advertising which is found to be one of the most important means in building brand equity is demonstrated to be not significantly related to brand awareness for this product category. Price promotion is positively related to brand awareness, supporting hypothesis 3.

## 5.3 Cumulative Brand-building Effects

In order to test whether the customer mind-set measure captures more cumulative brand-building effects than product-market performance measure (H5), two types of analyses will be conducted. Firstly, stepwise regression will be implemented. It is expected that the loyalty variable will enter the model earlier in mind-set regression relative to revenue premium regression. Secondly, I will use Adstock to replace the current advertising expenditure in the model. Advertising is one of the most important means to building brand equity. And Adstock is used to capture the impact of the advertising expenditures of the previous period. As discussed in the methodology section, Adstock is obtained by calculating the following equation:

$$Adstock_{it} = (AdStock_{it-1})\lambda + (1-\lambda)Ad_{it} \quad (5)$$

Adstock will replace the current advertising expenditure in the regression model. I will use $\lambda$ values ranging from 0.0 (the current effects model) to 0.9 in increments of 0.1, and find a smoothing constant which produces the best fit for customer mind-set and revenue premium respectively. Since customer mind-set is expected to reflect cumulative brand-building effects better than product-market performance measure (in this study, measured as revenue premium), the $\lambda$ value which yields the best fit for customer mind-set measure should be larger than the $\lambda$ value producing the best fit for revenue premium.

### *5.3.1 Stepwise Regression*

Stepwise regressions will be conducted for the three models specified below. Although the purpose of stepwise regression is to test hypotheses 5 (H5: Customer mind-set measures capture more cumulative brand-building effects than product-market

performance measures), brand awareness is also used as the dependent variable in the model to explore the relative impacts of marketing mix elements on it.

$$CustmerMindset_{it} = \alpha_0 + \alpha_1 Ad_{it} + \alpha_2 Dist_{it} + \alpha_3 P_{it} + \alpha_4 \Pr om_{it} + \alpha_5 Loy_{it} + \alpha_6 T \quad (9)$$

$$\text{Re}venue\,\Pr emium_{it} = \beta_0 + \beta_1 Ad_{it} + \beta_2 Dist_{it} + \beta_3 P_{it} + \beta_4 \Pr om_{it} + \beta_5 Loy_{it} + \beta_6 T \quad (10)$$

$$BrandAwareness_{it} = \delta_0 + \delta_1 Ad_{it} + \delta_2 Dist_{it} + \delta_3 P_{it} + \delta_4 \Pr om_{it} + \delta_5 Loy_{it} + \delta_6 T \quad (11)$$

Where,

$Ad_{it}$ : advertising expenditure of brand i at time t;

$Dist_{it}$ : % ACV of brand i at time t;

$P_{it}$ : regular price of brand i at time t;

$\Pr om_{it}$ : percentage of sales made on price promotion of brand i at time t;

$Loy_{it}$ : share of category requirement of brand i at time t;

T: time.

**Table 25: Stepwise Regression Results**

| *Dependent Variable* | *Variable Step Entered* | *Number of Variables* | *Partial R-square* | *Model R-square* | *C(p)* | *F Value* | *Pr >F* |
|---|---|---|---|---|---|---|---|
| ***Customer Mind-set*** | 1. Advertising | 1 | 0.8038 | 0.8038 | 33.5918 | 262.25 | <.0001 |
| | 2. Loyalty | 2 | 0.0192 | 0.8231 | 26.2219 | 6.85 | 0.0111 |
| | 3. Distribution | 3 | 0.0295 | 0.8526 | 13.8423 | 12.41 | 0.0008 |
| | 4. Price Promotion | 4 | 0.0195 | 0.8721 | 6.3255 | 9.31 | 0.0034 |
| | | | | | | | |
| ***Revenue Premium*** | 1. Advertising | 1 | 0.8095 | 0.8095 | 35.3121 | 271.92 | <.0001 |
| | 2. Loyalty | 2 | 0.0330 | 0.8425 | 20.4569 | 13.20 | 0.0006 |
| | 3. Price Promotion | 3 | 0.0135 | 0.8559 | 15.5822 | 5.79 | 0.0190 |
| | 4. Distribution | 4 | 0.0259 | 0.8818 | 4.3534 | 13.37 | 0.0005 |
| | | | | | | | |
| ***Brand Awareness*** | 1.Distribution | 1 | 0.4681 | 0.4681 | 64.9409 | 56.33 | <.0001 |
| | 2. Loyalty | 2 | 0.0837 | 0.5519 | 51.1661 | 11.77 | 0.011 |
| | 3. Price | 3 | 0.1167 | 0.6686 | 24.2107 | 21.84 | <.0001 |
| | 4. Price Promotion | 4 | 0.0688 | 0.7374 | 9.1326 | 15.99 | 0.0002 |
| | 5. Advertising | 5 | 0.0228 | 0.7602 | 5.4834 | 5.70 | 0.0201 |

Table 25 summarizes the stepwise regression analyses. Firstly, the entry orders of the marketing mix elements into equations (9) and (10) are similar. For both models, advertising is the first variable being chosen to enter the model, followed by variable "loyalty". Distribution is found to be the third variable to enter the model when customer mind-set is used as the dependent variable. Then price promotion is the last one being chosen. For equation (10) in which revenue premium is the dependent variable, price promotion is the third variable being entered to the model, followed by distribution. For both equations, time and price do not enter the model. Since it is proposed that customer mind-set captures more cumulative brand-building effects than revenue premium, the variable "loyalty", which reflects the cumulative brand-building effects, is expected to enter into equation (9) earlier than its entry sequence into equation (10). However, the analyses results do not support our hypothesis. Two possible factors may contribute to this result. Firstly, the product category of our dataset is mature. Hence, the market is quite stable. And so are the customer mind-set and revenue premium measure. Therefore, the lack of enough variations in the dependent variables may not be able to capture the differences of the predicting variables. Secondly, the loyalty measure (assessed by "Share of Category Requirements") might not capture the cumulative brand-building effects. As our dataset is not time-series data in the strict sense, loyalty measures are actually capturing the differences in advertising expenditure or other marketing mix elements across different brands, but not the cumulative brand-building effects over the long run.

I also conducted stepwise regression to test the impact of marketing mix elements and loyalty on brand awareness. Firstly, distribution is found to be the first variable to enter the model, which illustrates the importance of distribution in building brand awareness for the frequently purchased consumer products. Similar to the regression results of equations (9) and (10), loyalty is the second variable being chosen for the model. As the fourth variable entering the model, sales promotion is also found to be positively related to brand awareness, further confirming hypothesis 4. By creating brand experience for consumers, price promotion increases brand awareness. Finally, advertising enters the model last, which is also consistent with the previous findings.

In summary, the results of stepwise regression analyses do not support the hypotheses that customer mind-set measures capture more cumulative brand-building effects than revenue premium. Loyalty is the second variable being chosen to enter into the model for both equations (9) and (10).

### *5.3.2 Effects of AdStock*

The other method to test hypothesis 5 is to use Adstock as the variable to capture the cumulative brand-building effects. Adstock measures the effects of previous advertising expenditure. Adstock replaces the current advertising expenditure. Therefore, customer mind-set and revenue premium are the dependent variables of Adstock, distribution, price and price promotion. More formally, the customer mind-set and revenue premium for brand i ($i = 1, 2, \ldots, m$) in the period t is given by the following equations. Since advertising is not found to have a significant association with brand awareness from the

previous analysis, brand awareness will not be used as the dependent variable in this particular analysis.

$$CusotmerMindset_{it} = \phi_0 + \phi_1 Adstock_{it} + \phi_2 Dist_{it} + \phi_3 P_{it} + \phi_4 \Pr om_{it} \quad (12)$$

$$\text{Re}venue \Pr emium_{it} = \varphi_0 + \varphi_1 Adstock_{it} + \varphi_2 Dist_{it} + \varphi_3 P_{it} + \varphi_4 \Pr om_{it} \quad (13)$$

Where,

$$Adstock_{it} = (Ad_{it-1})\lambda + (1-\lambda)Ad_{it} \quad (5)$$

$Dist_{it}$: % ACV of brand i at time t;

$P_{it}$: regular price of brand i at time t;

$\Pr om_{it}$: percentage of sales made on price promotion of brand i at time t;

Adstock is initialized equal to the brand's share of advertising expenditure in the first period for which advertising data is available (Pollay et al., 1996). For any value of $\lambda$, the Adstock measure for every other period is calculated using equation (4) successively on each brand's advertising share. I will use $\lambda$ values ranging from 0.0 (the current effects model) to 0.9 in increments of 0.1 and find a smoothing constant which produces the best fit for customer mind-set and revenue premium respectively. Since customer mind-set is expected to reflect cumulative brand-building effects better than product-market performance measure (in this study, measured as revenue premium), the $\lambda$ value which yields the best fit for the customer mind-set measure should be larger than the $\lambda$ value producing the best fit for the revenue premium.

**Table 26: Regression Results of Equations (12) & (13)**

| | Adjusted R-square | |
|---|---|---|
| $\lambda$ Value | Equation (12) Customer Mind-set as Dependent variable. | Equation (13), Revenue Premium as dependent Variable |
| 0 | 0.8024 | 0.8005 |
| 0.1 | 0.8476 | 0.8410 |
| 0.2 | 0.8605 | 0.8554 |
| 0.3 | 0.8744 | 0.8628 |
| 0.4 | 0.8839 | 0.8783 |
| 0.5 | 0.8929 | 0.8854 |
| 0.6 | 0.9006 | 0.8898 |
| 0.7 | 0.9073 | ***0.8909*** |
| 0.8 | 0.9129 | 0.8882 |
| 0.9 | ***0.9169*** | 0.8799 |
| 1 | 0.9168 | 0.8612 |

Table 26 summarizes the adjusted R –square value for different $\lambda$ values ranging from 0.0 (the current effects model) to 1 in the increments of 0.1 for equations (12) and (13). Overall, the results support the hypotheses that the customer mind-set measure captures more cumulative brand-building effects than the revenue premium. Specifically, for the customer mind-set measure, the smoothing constant of 0.9 provided the best fit, whereas $\lambda$ =0.7 provides the best fit for the revenue premium. The results suggest that the previous advertising expenditure contributes most to the customer mind-set. However, regarding the revenue premium, the current advertising has a relatively larger impact on product-market performance than its impact on customer mind-set. So, customer mind-set captures more cumulative brand-building effects. Therefore, hypothesis 5 is supported when Adstock is used to represent the cumulative brand-building effects.

## 5.4 Cross Prediction between Customer Mind-set, Brand Awareness and Revenue Premium

This section investigates the prediction relationship between customer mind-set, brand awareness and revenue premium. It is hypothesized that customer mind-set predicts revenue premium (H6). And, brand awareness is also the precedent of revenue premium (H7). The analysis will be conducted in two stages. In the first step, regression analysis is conducted to obtain the parameter estimates for subsequent prediction tests. In particular, time 1 to time 5 are used as the prediction sample. The dependent variables are the current value of brand equity, and the independent variables are the lag values of brand equity measures. In the second step, the estimated parameters from step 1 will be used to forecast the brand equity values of time 6. Then the prediction accuracies are compared.

### *5.4.1 Customer Mind-set and Revenue Premium*

General wisdom regards customer mind-set measures of brand equity as providing better diagnostic information for managers than product-market performance measures. Furthermore, according to the Brand Value Chain (Keller & Lehmann, 2003), product-market performance is the result of customer mind-set. However, such a notion has never been empirically tested. In our study, a cross-prediction analysis is utilized to investigate the relationship between customer mind-set and product-market performance measures. Specifically, the customer mind-set measures of the previous time periods are used to forecast the current revenue premium; and the revenue premium measures of the previous time periods are utilized to predict the current customer mind-set. Since there are 6 time periods in the current dataset, time periods from 1 to 5 are used to obtain the parameter

estimates. Then estimates are used to predict the brand equity value in time 6. Finally, the prediction accuracies of the two measures are compared. MAPE is used to assess the forecast accuracy.

$$MAPE = \frac{\sum_{t=1}^{n} \frac{|e_t|}{Y_t}}{n} \quad (14)$$

Where, $e_t$ is the forecast error in time period t;

$Y_t$ is the actual value in time period t;

$n$ is the number of forecast observations in the estimation period.

However, the comparison is made between two different dependent variables (i.e., customer mind-set vs. revenue premium). Therefore, $Y_t$ (the actual value in time period t) is replaced by the standardized deviation of the two measurements respectively to account for the different variances of the two variables.

The forecast is conducted in two steps. In step one, two regressions are conducted to obtain parameter estimates for forecast purpose. In particular, the revenue premium value of the previous one time period is used to predict the current customer mind-set value. And the customer mind-set value of the previous one time period is used to predict the current revenue premium. In step two, the coefficient estimates from step one are used to predict the customer mind-set and revenue premium in time 6 respectively. Finally, the prediction accuracies are compared. It is expected that time lag exists between customer mind-set and revenue premium. That is, the change in customer mind-set will not be reflected immediately in product-market performance. Hence, this cross-

prediction analysis will be implemented for the brand equity measures from the previous two, three, and four time periods. Specifically, I will use the lag two, three, and four customer mind-set values to predict the current revenue premium respectively. And, the revenue premium value from previous periods will be used to predict the current revenue premium. In addition, prediction accuracies will be compared.

Table 27 to Table 34 present the results of regressions. Customer mind-set measures are regressed on the revenue premium value from the previous four time periods respectively. And revenue premium measures are also regressed on the customer mind-set value from the previous time periods respectively.

**Table 27: Regress Customer Mind-set on Lag Revenue Premium**

| R square = 0.93 | | |
|---|---|---|
| *F= 578.05 (p< .0001, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | 0.11834 | <.0001 |
| Lag Revenue Premium | 4.97187E-10 | <.0001 |

**Table 28: Regress Customer Mind-set on Lag 2 Revenue Premium**

| R square = 0.93 | | |
|---|---|---|
| *F= 391.56 (p< .0001, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | 0.11518 | <.0001 |
| Lag 2 Revenue Premium | 4.97539E-10 | <.0001 |

**Table 29: Regress Customer Mind-set on Lag 3 Revenue Premium**

| R square = 0.93 | | |
|---|---|---|
| *F= 269.72 (p< .0001, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | 0.11244 | <.0001 |
| Lag 3 Revenue Premium | 5.11035E-10 | <.0001 |

**Table 30: Regress Customer Mind-set on Lag 4 Revenue Premium**

| R square = 0.92 | | |
|---|---|---|
| *F= 101.83 (p< .0001, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | 0.10852 | <.0001 |
| Lag 4 Revenue Premium | 5.01326E-10 | <.0001 |

**Table 31: Regress Revenue Premium on Lag Customer Mind-set**

| R square = 0.94 | | |
|---|---|---|
| *F=634.32 (p< .0001, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | -232,057,597 | <.0001 |
| Lag Customer Mind-set Measure | 1,930,219,689 | <.0001 |

**Table 32: Regress Revenue Premium on Lag 2 Customer Mind-set**

| R square = 0.93 | | |
|---|---|---|
| *F= 398.20 (p< .0001, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | -239,825,356 | <.0001 |
| Lag 2 Customer Mind-set Measure | 1,961,090,367 | <.0001 |

**Table 33: Regress Revenue Premium on Lag 3 Customer Mind-set**

| R square = 0.93 | | |
|---|---|---|
| *F= 275.10 (p< .0001, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | -247,462,432 | <.0001 |
| Lag 3 Customer Mind-set Measure | 1,970,072,352 | <.0001 |

**Table 34: Regress Revenue Premium on Lag 4 Customer Mind-set**

| R square = 0.93 | | |
|---|---|---|
| *F= 115.29 (p< .0001, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | -257,487,186 | <.0001 |
| Lag 4 Customer Mind-set Measure | 2,036,846,155 | <.0001 |

***Note: d.f. = degrees of freedom***

In general, the R square values of the regression analyses are good, ranging from 0.92 to 0.94, indicating a good model fit (Table 27 to Table 34). The results suggest that the lag values of the customer mind-set measure are a good predictor of the current value of the revenue premium. And, the revenue premium's lag values also explain the variations in the current value of the customer mind-set well.

In the next analyses, cross-prediction will be implemented and prediction accuracies will be compared. Specifically, the coefficient estimates are used to predict the customer mind-set and revenue premium in time 6 respectively. Then the prediction accuracies are compared.

**Table 35: MAPE Measures of Prediction Accuracy**

| | **MAPE** |
|---|---|
| Lag customer mind-set to predict current revenue premium | 0.22 |
| Lag revenue premium to predict current customer mind-set | 0.13 |
| | |
| Lag 2 customer mind-set to predict current revenue premium | 0.15 |
| Lag 2 revenue premium to predict current customer mind-set | 0.11 |
| | |
| Lag 3 customer mind-set to predict current revenue premium | 0.23 |
| Lag 3 revenue premium to predict current customer mind-set | 0.13 |
| | |
| Lag 4 customer mind-set to predict current revenue premium | 0.20 |
| Lag 4 revenue premium to predict current customer mind-set | 0.11 |

As Table 35 illustrates, the prediction accuracy of the revenue premium is better than that of the customer mind-set. Specifically, the prediction accuracy (measured by MAPE) of the revenue premium is ranging from 0.11 to 0.13; whereas, the prediction accuracy of the customer mind-set ranges from 0.15 to 0.22. For instance, if we use the customer mind-set measure from the previous one time period to forecast the current revenue premium value, the MAPE is 0.22. However, when the revenue premium measure from the previous one time period is used to predict the current customer mind-set, the MAPE is 0.13, indicating that its prediction accuracy is better than that of the customer mind-set. Therefore, hypothesis 6 (H6: Customer mind-set measure predicts product-market performance measure) is not supported by the cross-prediction tests.

The following reasons possibly explain why the revenue premium performs better than the customer mind-set in this cross-prediction test. Firstly, the product category would be one of the potential reasons. The Brand Value Chain model follows the general persuasive hierarchy model, that is, the "cognition → affect → behavior" pattern. The marketing communication of the brand first informs and persuades consumers, then it influences consumers' affect toward a brand. Such affects, in turn, induces consumers' behavior in the market. However, for low-involvement product category, consumers' affect or attitude toward a brand might be formed after the product experience or product trial. For instance, Ehrenberg (1974) suggests an awareness → trial → reinforcement sequence and indicates that the main effect of advertising is to reinforce the satisfaction of brands already used. Some empirical findings also support the notion that product usage experience has a greater impact on a consumer's attitude, belief or affect toward a

brand than does advertising (cf. Vakratsas & Ambler, 1999). The product category used in this current dataset is frequently purchased consumer packaged goods. Following the previous discussion, consumers' usage experience with the brand is likely to have greater impact than advertising or other marketing communications in shaping consumers' brand affect and attitude. Secondly, the product category of this dataset is mature and the major brands in this product category are well established. It is unlikely to observe a clear sequence of "marketing investment → customer mind-set →product-market performance" for such a mature product category. Marketing communications, consumers' existing attitudes or beliefs toward the brand and consumers' usage experience with the brand are likely to have influence on one another, or have interactions with one another. For instance, some empirical research finds that one of the major roles of advertising is to reinforce the habits or frames of consumers' previous usage experience for low involvement products (c.f. Vakratsas & Ambler, 1999). Therefore, the marketing communication activities are likely to interact with the consumer's brand experience, and in turn influence the customer's attitude toward the brand. Hence, for such mature product categories and well-established brands, teasing out such a clear sequence of "marketing investment → customer mind-set → product-market performance" would be difficult, if not impossible. Keller and Lehmann (2003) also suggest some possible modifications to the Brand Value Chain. For instance, feedback loops are possible. As the results of the cross-prediction analysis indicate, revenue premium could have feedback effects on customer mind-set. In addition, it is also suggested that "in some cases, the value creation may not occur sequentially as depicted" (p. 398). One possible example is that the stock analysts may react to some advertising

campaign. Hence, the stock price and shareholder value would be increased. Our analysis results also suggest that the sequence of "marketing investment → customer mind-set → product-market performance' may not happen sequentially either for mature, frequently purchased consumer packaged goods.

### *5.4.2 Brand Awareness and Revenue Premium*

Similar to the cross prediction tests conducted for customer mind-set and revenue premium, cross prediction analyses are implemented to explore the relationship between brand awareness and revenue premium (H7: Brand awareness predicts product-market performance measures). Brand awareness is regarded as one of the most important factors in determining the consumer's purchase behavior for low-involvement, frequently-purchased consumer packaged goods (Elliott & Percy, 2007). In addition, brand awareness is the prerequisite of building brand knowledge. It is named as an anchor in the consumer's mind, to which all the brand information is related (Aaker, 1991). Specifically, the brand awareness measures of the previous time periods are used to forecast the current revenue premium; and the revenue premium measures of the previous time periods are utilized to predict the current brand awareness. Since there are 6 time periods in the current dataset, time periods from 1 to 5 are used to obtain the parameter estimates. Then estimates are used to predict the brand equity value in time 6. Finally, the prediction accuracies of the two measures are compared. MAPE is used to assess the forecast accuracy.

Table 36 to Table 43 present the results of regressions. Brand awareness measures are regressed on the revenue premium value from the previous four time periods respectively. And, the revenue premium measures are also regressed on the brand awareness value from previous time periods respectively.

As the regression results indicate, R square values of all the regression analysis range from 0.18 to 0.27, indicating a relatively weak model fit compared to the previous regression models regarding revenue premium and customer mind-set. In particular, when the revenue premium values are used as explanatory variables, the models' fits are generally higher than those models whose explanatory variables are the lag values of brand awareness. This result implies that the lag values of revenue premium are better factors in explaining the variations in the current value of brand awareness. In addition, when the lag four value of the revenue premium is used as the independent variable, the estimated coefficient is not significant (p =0.85, Table 40). Likewise, when the lag three value of brand awareness is used as independent variables, its estimated regression coefficient is not significant either (p = 0.19, Table 44). Therefore, the lag four values of both revenue premium and brand awareness will not be used to cross-predict the current value of each variable in the analysis.

**Table 36: Regress Brand Awareness on Lag Revenue Premium**

| R square = 0.27 | | |
|---|---|---|
| *F= 15.18 (p= 0.019, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | 0.71823 | <.0001 |
| Lag Revenue Premium | 3.31238E-10 | <.0003 |

**Table 37: Regress Brand Awareness on Lag 2 Revenue Premium**

| R square = 0.27 | | |
|---|---|---|
| *F= 11.52 (p= 0.009, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | 0.72033 | <.0001 |
| Lag 2 Revenue Premium | 3.30329E-10 | 0019 |

**Table 38: Regress Brand Awareness on Lag 3 Revenue Premium**

| R square = 0.30 | | |
|---|---|---|
| *F= 8.52 (p= 0.008, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | 0.71092 | <.0001 |
| Lag 3 Revenue Premium | 3.47918E-10 | <.0085 |

**Table 39: Regress Brand Awareness on Lag 4 Revenue Premium**

| R square = 0.29 | | |
|---|---|---|
| *F= 3.75 (p= 0.08, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | 0.71202 | <.0001 |
| Lag 4 Revenue Premium | 3.4906E-10 | 0.085 |

**Table 40: Regress Revenue Premium on Lag Brand Awareness**

| R square = 0.23 | | |
|---|---|---|
| *F= 13.03 (p= 0.0008, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | -458,289,972 | 0.0065 |
| Lag Customer Mind-set Measure | 751,318,629 | 0.0008 |

**Table 41: Regress Revenue Premium on Lag 2 Brand Awareness**

| R square = 0.22 | | |
|---|---|---|
| *F= 8.65 (p= 0.006, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | -434,177,244 | 0.0276 |
| Lag 2 Customer Mind-set Measure | 715,717,222 | 0.0006 |

**Table 42: Regress Revenue Premium on Lag 3 Brand Awareness**

| R square = 0.22 | | |
|---|---|---|
| *F= 5.51 (p= 0.03, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | -420,437,296 | 0.08 |
| Lag 3 Customer Mind-set Measure | 700,747,400 | 0.03 |

**Table 43: Regress Revenue Premium on Lag 4 Brand Awareness**

| R square = 0.18 | | |
|---|---|---|
| *F= 2.00 (p= 0.19, d.f. =1)* | | |
| **Parameter** | **Estimate** | **P value** |
| Intercept | -378,845,788 | 0.31 |
| Lag 3 Customer Mind-set Measure | 645,384,682 | 0.19 |

***Note: d.f. = degrees of freedom***

In the next analyses, cross-prediction is implemented and prediction accuracies are compared. Specifically, the coefficient estimates are used to predict the customer mind-set and revenue premium in time 6 respectively. Then the prediction accuracies are compared. The revenue premium of the last one, two and three time periods are used to predict the current brand awareness assessment respectively. And, only brand awareness from the last one, two and three time periods are utilized to predict the current revenue premium measure.

**Table 44: MAPE Measures of Prediction Accuracy**

| | MAPE |
|---|---|
| Lag brand awareness to predict current revenue premium | 0.62 |
| Lag revenue premium to predict current brand awareness | 0.52 |
| | |
| Lag 2 brand awareness to predict revenue premium | 0.60 |
| Lag 2 revenue premium to predict current brand awareness | 0.52 |
| | |
| Lag 3 brand awareness to predict current revenue premium | 0.65 |
| Lag 3 revenue premium to predict brand awareness | 0.52 |

As Table 44 illustrates, the prediction accuracy of the revenue premium is better than that of the customer mind-set. The prediction accuracy (measured by MAPE) of the revenue premium is 0.52, whereas, the prediction accuracy of the brand awareness ranges from 0.60 to 0.65. For instance, if we use the brand awareness measure from the previous one time period to forecast the current revenue premium value, the MAPE is 0.62. However, when the revenue premium measure from the previous one time period is used to predict the current brand awareness, the MAPE is 0.52, indicating that its prediction accuracy is better than that of brand awareness. Hence, hypothesis 7 is not supported.

This finding suggests that consumers' brand usage experience determines whether consumers are able to recognize and recall that brand. It further supports the findings from the previous cross prediction tests regarding customer mind-set and brand equity. Furthermore, this finding implies that consumers do not have to know a brand prior to

their purchase decision. Some purchase decisions are likely to be made on-the-spot when consumers are doing shopping in the distribution outlets. Hence, the result confirms the previous finding regarding the relationship between brand awareness and marketing mix elements. In the previous analysis, distribution and price promotion are found to have a positive relationship with brand awareness. And, distribution is the most important element in enhancing brand awareness.

**Chapter Summary**

To summarize, this chapter conducted empirical analyses regarding the conceptual differences, similarities and relationship between two brand equity measures, namely, customer mind-set and revenue premium. The chapter started by examining the brand equity trends over the time period. It is found that, at the aggregate level, brand equity as measured by customer mind-set or revenue premium does not exhibit any trend over time. However, at the individual brand level, some brands indicate erosions in brand equity over time. Then, the correlation between customer mind-set and revenue premium is conducted to test whether they measure the same underlying brand equity constructs. Besides the customer mind-set and revenue premium, some other product- market performance and customer mind-set measures are also included in the analysis, such as brand awareness, market share, and price premium. The correlation analyses found that customer mind-set and product-market performance measures are generally highly correlated, which indicates that they are assessing the same construct, brand equity. This finding supports hypothesis 1 and 2.

Following the correlation analysis, the impacts of marketing mix elements on customer mind-set, brand awareness and revenue premium are explored respectively. The effects of marketing mix elements are similar for both the customer mind-set and revenue premium. Advertising, distribution and price are found to be positively associated with both measures, while price promotion is negatively related to both customer mind-set and revenue premium. Hence, hypothesis 3 is supported. Regarding the impact of marketing mix elements on brand awareness, distribution is identified to be the most important factor enhancing brand awareness. Price promotion, contrary to its effect on overall brand equity, has a positive influence over brand awareness. Hypothesis 4 is supported.

Next, the effects of Adstock on customer mind-set and revenue premium are investigated. The customer mind-set is found to reflect more cumulative brand-building effects than revenue premium does, which supports hypothesis 5.

Finally, cross-prediction tests are implemented to test hypothesis 6 and 7. The results indicate that revenue premium predicts customer mind-set measure better than customer mind-set and brand awareness. The findings do not support the hypotheses and are also contrary to the conceptual relationship proposed by the Brand Value Chain (Keller & Lehmann, 2003). The academic and managerial implications of the findings will be discussed in the following chapter.

# CHAPTER 6: DISCUSSION

In this chapter, the findings presented in the previous chapter and their implications are discussed. The main research question of the dissertation is, "What are the relationship and differences between two types of brand equity measures, namely, customer mind-set measure and product-market performance measure?" The previous chapter reported the correlations of customer mind-set and product-market performance measures. This was followed by an examination of the respective impact of marketing mix elements on customer mind-set and product-market performance measure. Furthermore, it was explored whether customer mind-set measure captures more cumulative brand-building effects than the product-market performance by considering the Adstock impact on both measures respectively. Finally, the cross-prediction relationship between customer mind-set and product-market performance measure was tested. The implications of the results from the analyses are discussed below.

The discussion will focus on the stability issue of brand equity. Then, the differences and similarities between the customer mind-set and product-market performance measures, and the prediction relationship between the two measures, will be discussed.

## 6.1 Brand Equity Stability

The notion that brand equity is a stable concept, and is unlikely to vary drastically from time to time, is confirmed by the highly positively correlation between the current and the lag value of brand equity. In particular, this study used three brand equity measures,

namely, brand awareness, overall customer mind-set measure and revenue premium. The correlations of all of the three measures, with their lagged value, range from 0.98 to 0.99 ($p<.0001$). Hence, brand equity is demonstrated to be very stable. Furthermore, this result confirms the findings in Ailawadi et al. (2003). In their study, the correlation of revenue premium with its lagged value in the local sample is 0.96, and the correlation of revenue premium with its lagged value in the national sample is 0.98.

In the current study, both product-market performance measure and customer mind-set measures are analyzed. Two customer mind-set measures, namely, brand awareness and overall customer mind-set, are used in the analyses. And, the correlation of customer mind-set measures with their lagged value is also highly positive. Therefore, it would be safe to draw the conclusion that brand equity is very stable, based on our empirical results. It appears unlikely for managers to change the brand equity within a short time. This could be good news as well as bad news for managers. It takes long-term investments to build a brand, and at the same time, once the brand equity is being built, it is unlikely to decay within a short time period, given a relatively stable market or no major negative publicity of the brand. Therefore, the well-established brands with high brand equity will be able to benefit from the past investment in the brand for a reasonably long time, even if advertising support is dropped (Aaker, 1991). For instance, Boston Consulting Group compared the leading brands in 1925 with those in 1985 in 22 product categories, and found that the leading brands in 19 product categories were the same (Aaker, 1991). On the other hand, for new brands or brands whose brand equity is relatively weak, it will take a lot of endeavor, as well as a long time period, for the brand to take up. In addition,

for brands with negative brand image, it would be very tough for managers to alter such brand knowledge in customers' minds. Therefore, in summary, it would be hard for a challenging brand to compete with those brands that are well-established (Aaker, 1991).

### 6.2 Trends in Brand Equity Measure

Brand equity is not significantly correlated with time on aggregate data. Furthermore, the time variable is found to be insignificant in the regression analysis on the aggregate data. However, when examining at the brand level, we find that the brand equity displays a trend of decline. Both the brand equity measured by the customer mind-set and the revenue premium are found to decrease over time. Three brands out of the 11 brands in the dataset experienced a decrease in brand equity measured in customer mind-set. Seven brands out of the 11 brands in the dataset underwent a decrease in brand equity measured in revenue premium. And the decrease of brand equity was accompanied by the increase of sales and market share of the private label.

Our results confirm the conventional notion that the growth of the private label has a negative impact on the brand equity of national brands. Furthermore, our results are consistent with the findings Ailawadi et al. (2003), where a median percentage loss in revenue premium across all brands was 29% over a six-year period. Furthermore, Sriram et al. (2007) also found an erosion of brand equity measured by product performance in the market in the toothpaste category. And, big brands such as Crest and Colgate are found to have lost most in terms of percentage. This current study not only demonstrates that revenue premium is decreasing over time, but also that the customer mind-set

measure is eroding over time. In addition, the number of brands whose revenue premium is decreasing is greater than the number of brands whose customer mind-set is decreasing. This result may suggest that revenue premium can "flag when a brand is in trouble or when it is strong " (Ailawadi et al., 2003, p. 2).

Brand awareness remains very stable over the three-year time period in our sample. Only two brands indicate some change in brand awareness over time. Brand H demonstrates a decline in brand awareness, whereas, Brand K's brand awareness rises over time from 2004 to 2006. Possible reasons of the stability of brand awareness are as follows. Firstly, this product category is quite mature, and the several brands in this data set are well established. There might be no room for the brand's awareness to increase (i.e., saturation effect). Secondly, brand awareness itself is a very stable concept. And, the brand awareness of a well-established brand is likely to stay high over a long time period (Aaker, 1991).

However, high brand awareness does not guarantee high brand equity, either measured in customer mind-set or product-market performance. Customers must have a reason to purchase the brand even though they can recall and recognize the brand. Hence, it is observed that the stable brand awareness is actually accompanied by the erosion in overall brand equity in this product category. For a mature product category, where the market is well penetrated, companies must find ways to convey new information on the product to customers and give them a "reason" to purchase the brand. Brand A is the only brand whose revenue premium enjoyed an increase over the three-year period in our

sample. The possible reason underlying such an increase could be the introduction of a series of new products into the market since late 2004. The importance of R&D has been demonstrated in previous literature (e.g. Simon & Sullivan, 1993).

### 6.3 Customer Mind-set & Product-market Performance Measures

Three types of brand equity measures are investigated in the thesis, namely, brand awareness, customer mind-set and revenue premium. Brand awareness assesses whether customers know about this brand. And customer mind-set measures the overall brand knowledge in the customer's mind. Revenue premium is one of the measures of the brand's performance in the market place. The following discussion, regarding the differences of different brand equity measures, will focus on the overall brand equity assessment. Hence, the focus will be on the customer mind-set and revenue premium measure. The similarities between the two measures will be discussed first, followed by the discussion of the differences between the two measures. Finally, the prediction relationship between customer mind-set and revenue premium will be explored.

Essentially, the customer mind-set and the revenue premium measure the same underlying construct, that is, brand equity. Customer mind-set assesses the brand knowledge in customers' minds, while revenue premium gauges the brands' performance in the market place. This notion is supported by our empirical analyses results.

Price premium is found to have a positive correlation with both customer mind-set and revenue premium. In the work by Bello and Holbrook (1995), brand equity is measured

by price premium. However, they did not find significant price premium effects in the product categories (popcorn, coffee, recording tapes, colas and automobiles) included in their study after controlling for the quality. Ailawadi et al., (2003) didn't find significant correlation between price premium and revenue premium in their work. However, our work illustrates that price premium is positively correlated to both customer mind-set and revenue premium. The result suggests that price premium does capture some facet of the brand equity. On the other hand, the correlation of price premium with customer mind-set and revenue premium is not strong. Its correlation with customer mind-set is 0.28 ($p<.05$). And, its correlation with revenue premium is 0.24 ($p<.05$). Hence, this result illustrates the importance of considering not only price but also volume when measuring brand equity in the market place.

In addition to the correlation analysis of brand equity measures, this study also investigates the impact of marketing mix elements on customer mind-set and revenue premium respectively. It is found that the impacts of marketing mix elements (including advertising, distribution, price and price promotion) on customer mind-set and revenue premium are similar. This finding provides support to the notion that customer mind-set and revenue premium assess the same underlying construct (i.e., brand equity). In particular, advertising, distribution and price are found to be positively associated with both customer mind-set and revenue premium. And, price promotion is found to have a negative association with both customer mind-set and revenue premium. In summary, the correlation tests and the investigation of the marketing mix elements' association with

two brand equity measures provide evidence that customer mind-set and revenue premium essentially assess the same underlying brand equity construct.

However, some differences between the two measures are also observed. Customer mind-set is found to capture more cumulative brand-building effects than revenue premium. Brand equity is a long-term concept and it is built up by the brand's marketing investment over the long run. Essentially, brand equity reflects the history of investments in the brand. Therefore, a measure which better captures the cumulative brand-building is expected to represent the "true" brand equity better.

Finally, regarding the relationship between customer mind-set and revenue premium, the current study uncovers that revenue premium predicts customer mind-set better. According to the Brand Value Chain, marketing communication activities influence the brand knowledge in the customer's mind. Then, the brand knowledge in the customer's mind, in turn, is transferred into the brand's market performance. Some factors, such as competitive reaction, channel support and customers' profile, may moderate (either multiply or negate) the effects of the customer mind-set. However, our study demonstrates that revenue premium (i.e., the product-market performance) predicts customer mind-set. For frequently purchased consumer packaged goods, consumers may not follow the sequence of "cognition → affect → behavior". It is likely that the sequence of "awareness → trial → affect" actually happens in low-involvement purchase of products. The purchase of frequently purchased consumer packaged goods does not involve high financial risk or social risk. Hence, consumers are unlikely to spend a lot of

time in collecting information about brands, coming up with a group of alternatives, and making their purchase decision. On the contrary, consumers' attitudes or affects toward the brand may be formed after their trial or usage experience with the brand. Therefore, revenue premium (i.e., product-market performance) predicts customer mind-set.

This finding has several theoretical implications. Firstly, the Brand Value Chain model may be context specific. For instance, it may be more appropriate for a new brand or a new product category to follow the sequence of "marketing investment → customer mind-set → product-market performance" as opposed to a mature product category with several well-established brands. Secondly, the sequence of "customer mind-set → product-market performance" might be reversed for some low-involvement frequently purchased consumer products. For such product category, brand awareness may be sufficient to generate sales or purchase behavior. And the consumers' usage experience with the brands contributes in building the brand knowledge in consumers' minds. The marketing communications of the brand reinforce the information and knowledge in the customer's mind after their trial. This finding also suggests an alternative modification added to the Brand Value Chain model. The product-market performance could have feedback effects to customer mind-set. In addition, when customer mind-set is transferred into product-market performance, this process may involve a lot of noise, such as competitors' reactions, consumers' profiles and trade support. However, when product-market performance feeds back to customer brand knowledge, this process involves less noise. That is, product trial and usage experience are the major and most important elements in building brand equity.

### 6.4 Brand Awareness

Brand awareness is the premise to building brand equity. It is like an "anchor" of the brand knowledge in the customer's mind, to which the brand-related information could be linked (Aaker, 1991). Without brand awareness, it is impossible to build the brand knowledge in the customer's mind. The thesis also explores the differences and similarities between brand awareness and the overall brand equity assessment. Similar to the overall brand equity measures, brand awareness is very stable and it is unlikely to change drastically from the previous time period to the following time period. Once brand awareness is built, it will last a long time even if advertising is dropped.

Differences between brand awareness and overall brand equity measures are identified in the current study. The impact of marketing mix elements on brand awareness is different from their impact on overall brand equity. Advertising is not the most important marketing element associated with brand awareness. In addition, price promotion is found to have a negative association with both customer mind-set and revenue premium. However, it has a positive relationship with brand awareness. Price promotion encourages brand switching and gives consumers incentives and chances to try those brands which they do not purchase on regular price. Hence, brand awareness is enhanced. This finding suggests that the valence of information or product experience would not impact the brand awareness. Sheer brand exposure or experience will enhance brand awareness.

The current study also investigates the correlation between brand awareness with overall brand equity assessment. Brand awareness is positively related to both customer mind-set and revenue premium, indicating that familiarity induces liking, especially for frequently purchased consumer packaged products (Aaker, 1991). Few studies have explored the relationship between brand awareness and the brand's performance in the market. Only Silverman et al., (1999) have investigated the correlation between familiarity and brand value. However, a very weak relationship between brand familiarity and brand value is found. In their study, the annual Brand Value reported by Financial World is utilized as the measure of brand equity. Brands in their study are corporate brands, such as IBM, Shell, and Cisco, which have very high brand awareness. However, respondents who are familiar with those brands are not necessarily customers of them. In addition, respondents in their study are undergraduate students. Therefore, it is unlikely that the brand awareness would be found to be highly correlated to the market outcome in Silverman et al., (1999). Our study utilizes the brand level data, and it links the real market data to the brand awareness. The results illustrate a positive relationship between brand awareness and brand equity, which indicates that brand awareness, not only increases consumers' preference to the brands, but also enhances the market performance (in terms of sales) empirically.

Finally, cross prediction analysis between brand awareness and revenue premium also indicates that revenue premium predicts brand awareness better. The results have several theoretical implications. Firstly, the results echo with findings of the prediction tests regarding the relationship between customer mind-set and revenue premium. It is also

demonstrated that product usage experience feeds back to brand awareness, which in turn enhances the overall brand equity. In addition, the results also indicate that the purchase decision of frequently purchased consumer packaged goods does not necessarily require brand awareness in the consumer's mind before the consumer's visit to the distribution outlets. The purchase decision could be made right on the spot. Even when consumers do not know the brands before their visit to the grocery store, the sheer shelf visibility may induce purchase behavior. The product usage experience, in turn, enhances brand awareness. Secondly, the cross-prediction results also confirm the regression analysis findings regarding the impact of marketing mix on brand awareness. Distribution is found to be the most important element establishing brand awareness. And, price promotion is positively related to brand awareness, contrary to its effects on overall brand equity.

### 6.5 Marketing Mix Elements and Brand Equity

Besides the exploration of relationship between customer mind-set measure and product-market performance measure, the thesis also examines the relationship between marketing mix elements and brand equity. In particular, it is the first time that a study links the real market data with customer mind-set. That is, the study relates the managers' marketing decisions to what is happening in customers' minds. One of the advantages provided by customer mind-set measures is their diagnostic ability. Essentially, Keller, (1993) for the first time, identified the "sources" of brand equity: brand knowledge in the customer's mind. Furthermore, components of brand knowledge are also identified: brand awareness and brand image. Therefore, the fundamental way to build brand equity is to build brand knowledge in the customer's mind. Linking the real market data to customer

mind-set measures reveals the relationship between specific marketing decision/elements and customer mind-set measures. Furthermore, using both customer mind-set and revenue premium as dependent variables respectively demonstrates the robustness of the analysis.

Firstly, advertising is found to be the most important element to building brand equity. Our findings confirm the empirical results found by other studies (e.g. Ailawadi et al., 2003; Sriram et al., 2007; Yoo et al., 2000). Advertising sends out product-related information and shapes the brand image in consumers' minds. A good advertising copy may induce positive brand attitude, and consumers are likely to transfer such positive attitudes of the advertising toward the brand being advertised (Aaker, 1987). However, for frequently purchased consumer packaged goods, advertising is unlikely to play an important role in generating brand awareness. Consumers are unlikely to pay attention to advertising of products in a well-penetrated and mature product category, unless advertising conveys some unique or innovative information about this product.

Secondly, distribution intensity is found to have a positive relationship with brand equity. For frequently purchased consumer packaged goods, distribution intensity creates customer satisfaction by saving time and energy for consumers to search for a specific brand. Furthermore, consumers do not have to compromise their brand preferences if a specific brand is not available in the distribution outlets. However, this finding could be context specific. For instance, for luxury goods, intensive distribution could even hurt the

exclusive brand image of the brands. And, the fit between distribution outlets and the product image is also important in generating brand equity.

Thirdly, in our study, price promotion is negatively related to overall assessment of brand equity. The finding confirms the results found in the work by Yoo et al., (2000). It is inconsistent with the results found by Ailawadi et al., (2003), where an insignificant relationship between price promotion and revenue premium is identified. However, our study uses two types of brand equity measures, namely, customer mind-set and revenue premium. When each measure is used as the dependent variable in the model, price promotion is found to be negatively associated with brand equity. Hence, overuse of price promotion has an adverse influence on brand equity, because it decreases the perceived quality and the consumer's internal reference price of the brand. And in the long run, the customer's attitude toward the brand and the brand's market performance will be influenced negatively.

### 6.6 Managerial Implications

The following section will discuss and illustrate managerial implications of this study; in particular, how to use the two types of brand equity measures and how to track brand equity. Feedback effects of product-market performance to customer mind-set will be discussed. Finally, building brand equity by implementing marketing mix elements will also be explored.

### *6.6.1 Customer Mind-set Measure or Revenue Premium?*

The results suggest that revenue premium is a convenient and practical choice for managers to track brand equity. Firstly, our results demonstrate that customer mind-set and revenue premium measures assess the same underlying construct, brand equity. Hence, in terms of the overall brand equity assessment, revenue premium tells the same information as the customer mind-set. In addition, revenue premium provides a convenient method for managers to track brand equity continuously. Tracking customer mind-set measure generally requires tedious efforts such as questionnaire design, sample selection and survey, which raises difficulties for managers especially when they have to track brand equity continuously. And, for relative smaller brands in the market, managers may not have the time and financial resources do such tracking. On the contrary, revenue premium only requires the revenue of the branded products and private labels, which information are readily available for managers. Secondly, the thesis finds the feedback effects of revenue premium on customer mind-set for the mature, frequently purchased consumer packaged goods category. Revenue premium flags the problems of the brand before the customer mind-set does. In addition, customers' usage experience with the brands turns out to be the most important factor in building brand equity. Therefore, tracking brand equity by using revenue premium could signal the problems of the brand to managers earlier than the customer mind-set measures. Furthermore, collecting customer mind-set measures generally takes a longer time to collect compared to revenue premium. Thus, revenue premium provides a convenient way to track the real-time brand equity.

However, the caveats exist when using revenue premium. Firstly, as revenue premium is essentially a benchmark measure, the choice of the baseline brand would be very important when utilizing revenue premium to track brand equity. In our dataset, there exists the private label, and the activities of the private label are actually similar to the products with "no name". However, the private labels of certain product categories may command brand equity. In addition, some private labels are trying to position themselves as prestige brands. For instance, the private label "President's Choice" of Loblaws, the largest Canadian grocery chain, illustrates that the private label could evolve into the premium brand and compete with national brands (Wulf, Odekerken-Schroder, Goedertier, & Ossel, 2005). Thus, selection of the baseline brand might be quite challenging for certain product categories. In the work of Ailwadai et al., (2003), the lowest-price or lowest-share brand is recommended as the choice of the baseline brand to compute the revenue premium measure. And, they have demonstrated the robustness of the revenue premium measure as long as the choice of the baseline brand is sensible. Secondly, compared to customer mind-set measures, the revenue premium measure does not provide diagnostic information. Thus, although the revenue premium would signal the problems with the brand, equity does not offer information on what is wrong with the brand. It is still advisable for managers to check the customer mind-set if revenue premium flags problems of the brand. Finally, the real source of brand equity is the brand knowledge in the customer's mind and the customer's product usage experience should be transferred into brand-related knowledge in the customer's mind. Managers are suggested to examine the feedback effects of revenue premium on customer mind-set, so that they would be able to know whether product usage experience provides positive

brand information and contributes to the overall brand knowledge in the customer's mind. I will illustrate how to track the feedback effects of revenue premium (i.e., product-market performance) on customer mind-set in the following discussions in detail.

Regarding customer mind-set measures, the major advantage is the diagnostic information provided. In the thesis, customer mind-set measure is designed based on the customer-based brand equity concept. Specifically, it includes brand performance, brand feelings, brand image and brand judgment (Keller, 1993). The thesis shows that customer-based brand equity could be operationalized realistically and gives good reliability and validity. In addition, the customer mind-set measure captures more cumulative brand-building effects. Therefore, in addition to diagnostic information, customer mind-set reveals information closer to the "true" brand knowledge in the customer's mind. By tracking customer mind-set over time, managers would be able to diagnose the impact of their marketing action. This type of insight may not be feasible with revenue premium type measures.

### *6.6.2 Illustrative Application for Tracking Brand Equity: The Case of Brand I*

I use Brand I to demonstrate how to track brand equity measured both in revenue premium and customer mind-set by following similar method implemented by Sriram et al. (2007). Moreover, I illustrate how to diagnose the tracking information and use the information for future marketing decision.

Firstly, we use values of marketing mix elements to predict the revenue premium and customer mind-set. Specifically, the lag value of brand equity from previous time periods, the current advertising expenditure, distribution intensity, net price and price promotion are used to forecast the current revenue premium or customer mind-set respectively (Siram et al., 2007). The models are as follows respectively,

$$CusotmerMindset_{it} = \kappa_0 + \kappa_1 LagCustomerMindset_{it} + \kappa_2 Ad_{it} + \kappa_3 Dist_{it} + \kappa_4 P_{it} + \kappa_5 \Pr om_{it} \quad (15)$$

$$\text{Re}venue\,\Pr emium_{it} = \mu_0 + \mu_1 Lag\,\text{Re}venue\,\Pr emium_{it} + \mu_2 Ad_{it} + \mu_3 Dist_{it} + \mu_4 P_{it} + \mu_5 \Pr om_{it} \quad (16)$$

Then, the "observed" brand equity measures in customer mind-set and revenue premium are compared to the predicted confidence band. In Figure 3 and Figure 4, I present the "observed" brand equity in revenue premium and customer mind-set respectively, along with the 95% confidence band of the brand equity that model (15) and (16) would predict. Thus, points within the confidence band represent observed brand equity values that can be explained with some confidence by the Brand I's previous brand equity and its current marketing activities, including advertising, distribution, price and price promotion. On the other hand, "points outside the confidence band would require further investigation since they cannot be well explained by the systematic factors" (Sriram et al., 2007, p. 73).

In the case of Brand I, one case of the observed revenue premium falls out of the confidence band. And two cases exceed the upper band slightly. Regarding its measure of customer mind-set, one observed value falls out of the lower confidence band. These deviations warrant discussions.

Regarding the revenue premium of Brand I, the observed revenue premium of the first half year of 2005 and the first half year of 2006 exceed the upper confidence band slightly. In particular, the 95% upper confidence band of the first half year of 2005 is 770,707,700 $, but the observed revenue premium is 775,055,910 $. And the 95% upper confidence band of the first half year of 2006 is 795,091,452$, while the observed revenue premium is 796,965,773$. The first deviation (in the first half year of 2005) marks the new product introduction of Brand I. In January 2005, Brand I introduced a new product to the market. And the second deviation (in the first half year of 2006) coincides with another new product introduction of this brand. In April, 2006, I launched a new product into the market. On the other hand, the observed revenue premium of Brand I in the second half year of 2005 is lower than the 95% lower confidence band of predicted value. And this negative deviation coincides with the competitive new product introduction. In October 2005, Brand A launched a series of new products into the market. These new products introduced by Brand A are innovative in terms of their form and usage compared to the previous products in this product category. And they provide great convenience to consumers. In addition, they challenge the conventional package of this product category.

Regarding the trend of customer mind-set measures, it is observed that customer mind-set does not change at the same time with the introduction of new products. The customer mind-set of Brand I falls out of the lower predicted confidence band in the first half year of 2006. The change in customer mind-set almost follows the change in revenue premium, which confirms that the consumers' product experience feeds back to the brand

knowledge in their mind. Overall, there is only one deviation identified in customer mind-set measure of Brand I, compared to three deviations found in the revenue premium of Brand I.

In summary, the illustration of Brand I's brand equity from 2004 to 2006 indicates that: 1) new product introduction is very important for brands to enhance their brand equity, especially for a mature product category, and 2) customer usage experience of the brand is crucial in building brand equity. Furthermore, the Brand I's illustration indicates that managers could track the observed brand equity with the predicted values and look into reasons of deviations in the observed value. Generally, the data of advertising expenditure, distribution, price and net price are readily available for managers. Therefore, they could investigate what increases the brand equity besides the major marketing mix elements.

**Figure 3: Revenue Premium of Brand I**

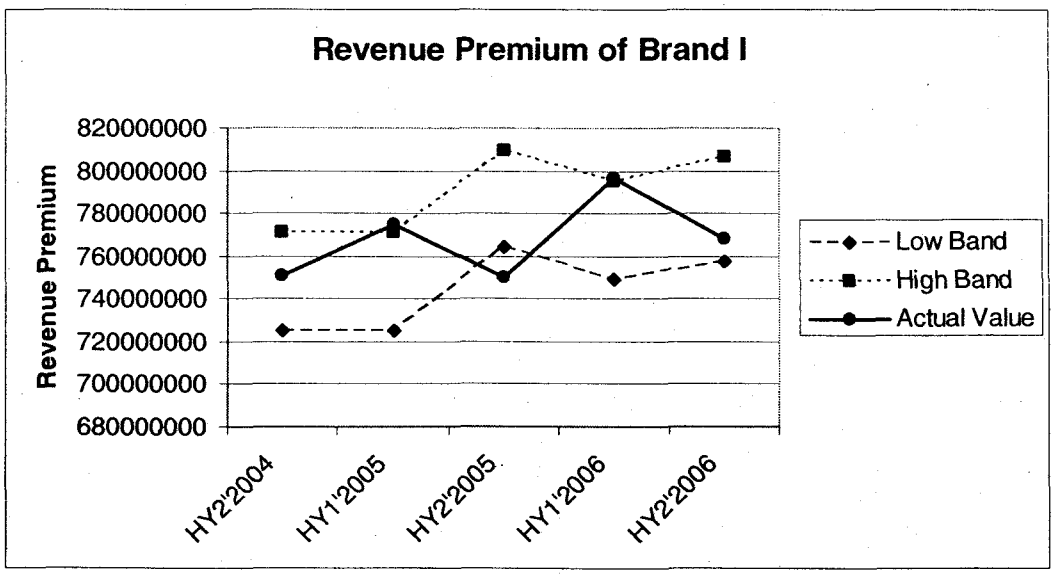
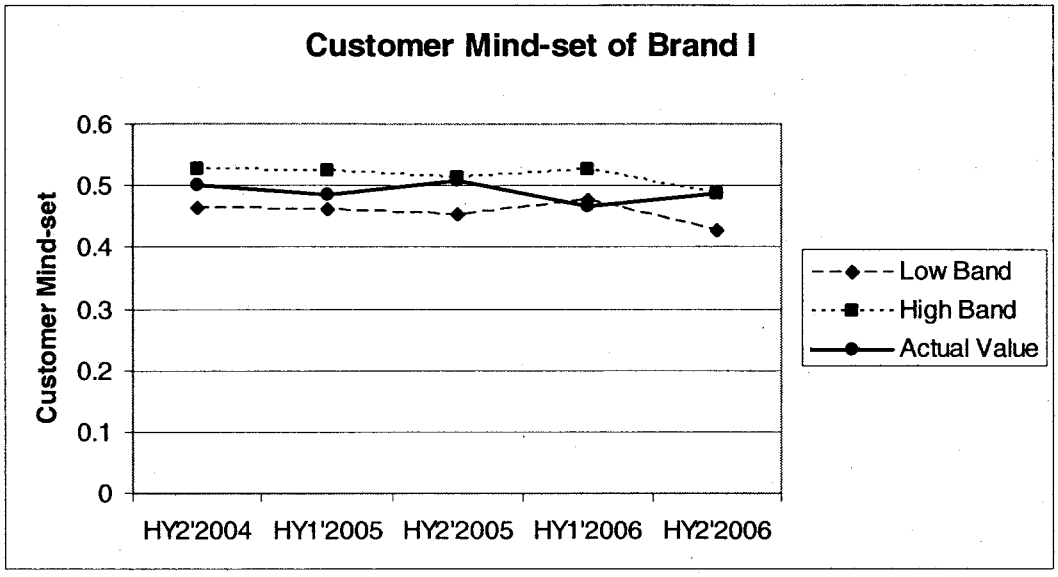


**Figure 4: Customer Mind-set of Brand I**




### *6.6.3 Illustrative Application on Tracking Feedback Effects on Revenue Premium on Customer Mind-set: The Case of Brand I & A*

Managers are also advised to track the feedback effects of revenue premium (i.e., product-market performance) on customer mind-set. In particular, managers could utilize the revenue premium value from the previous time period to predict the customer mind-set measure of the current time period. The model is as follows:

$$CusotmerMindset_{it} = \rho_0 + \rho_1 Lag\,\mathrm{Re}venue\,\mathrm{Pr}emium_{it} \quad (17)$$

Then, they could compare the observed customer mind-set value with the predicted confidence band in order to identify any positive or negative deviations. The case of Brand I and Brand A demonstrates the strategic lessons of how to build brand equity.

Figure 5 illustrates the observed customer mind-set measures of Brand I, compared to the confidence band predicted from the lag revenue premium value. Different from Figure 4, none of the observed customer mind-set values has exceeded the upper confidence band. Nor has the observed customer mind-set value fallen out of the lower confidence band. The feedback effects of revenue premium on customer mind-set look normal for Brand I. Although Brand I introduced new products into the market in the first half year of 2005 and the first half year of 2006, no surprise is observed in terms of the customer mind-set. That is to say, customers do not feel exceptionally good about the brand after their usage of the products, including the new products.

However, Brand A illustrates a different picture (Figure 6). The observed value of customer mind-set surpasses the upper confident band predicted by the revenue premium value of the last time period. That is to say, that customers' product usage experience is exceptionally good concerning the new products introduced by Brand A in the previous time period. Hence, the brand knowledge is enriched by the brand experience and customers' affect toward the brand is boosted.

Both Brand I and Brand A introduced new products. However, feedback effects of product-market performance are different. A brief discussion of the differences of the marketing activities between Brand I and Brand A might help to understand such differences. Firstly, the new products introduced by Brand I are generally the line extensions in this product category. But the new products introduced by Brand A are very different from its previous products and the existing products in this product

category. In other words, the new products are very unique in terms of their size, package and quality. Furthermore, the introduction of Brand A is accompanied by a heavy and innovative advertising and public relation campaign. On the contrary, Brand I introduced the new product in January 2005. But the advertising expenditure dropped slightly within that time period. Advertising would play an important role in framing and reinforce the product usage experience, and, in turn, contribute in building brand knowledge in customers' minds.

Several potential factors may help to amplify the feedback effects of revenue premium on customer mind-set. Firstly, advertising could reinforce or frame the usage experience (cf. Vakratsas & Ambler, 1999). Secondly, brand quality is also essential in determining whether customers would develop positive brand attitude following the usage of the product. Thirdly, the customers' perceived value of brand influences customer satisfaction with the product, and hence impacts on the customer mind-set. Generally, the perceived value of a brand refers to the benefits that customers obtained from the brand, compared to the price they paid for that brand (Zeithaml, 1988). A brand with a high perceived value is expected to multiply the feedback effects of revenue premium. The factors which have synergies with the brand market performance warrant further investigation in future studies.

**Figure 5: Customer Mind-set of Brand I**

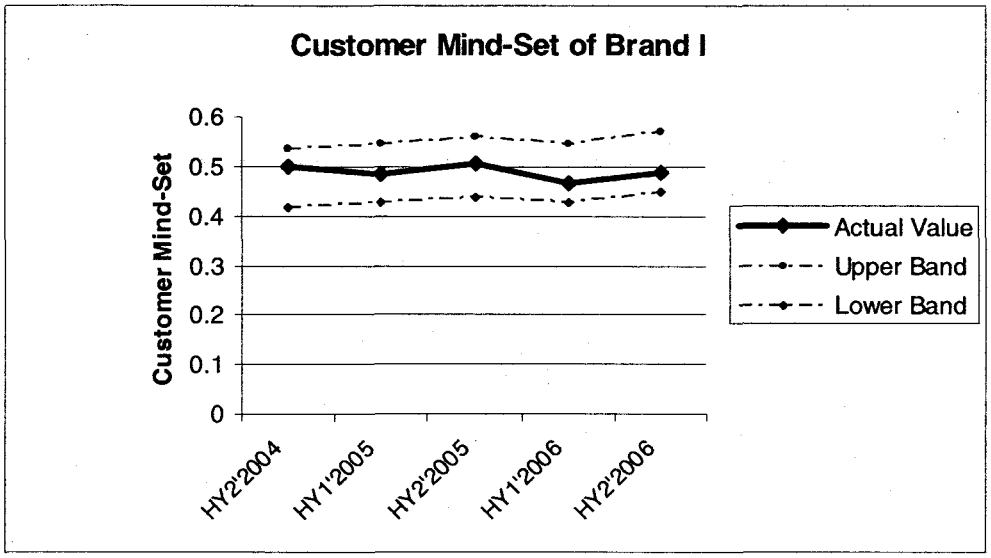
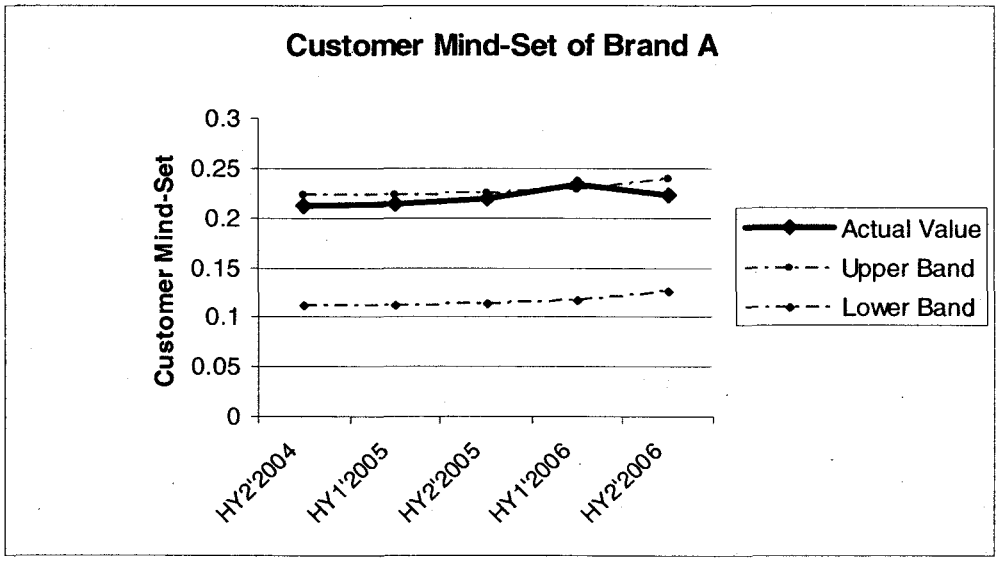



**Figure 5: Customer Mind-set of Brand A**




### *6.6.4 Managerial Implications of How to Build Brand Equity*

The thesis links the real marketing activity data with the customer mind-set brand equity measure and the revenue premium measure. In addition, it explores the impact of marketing mix elements on the overall brand equity, as well as the brand awareness. In

general, the findings confirm the empirical results in the literature. That is, advertising, distribution and price are positively associated with the overall brand equity. However, several important findings are worthwhile to discuss in terms of their managerial implications.

Firstly, managers could utilize price promotion to build brand awareness. For the low-involvement, consumer packaged goods, brand awareness is important for consumers when making purchase decisions. In addition, the familiarity will induce the liking of the brand. Price promotion gives incentive for consumers to try different brands. For instance, price promotion may induce consumers to switch to brands with the relatively higher price. And the brand usage experience will enhance brand awareness. For smaller brands, price promotion may endow an incentive for consumers to give them a try. Therefore, brand awareness will be increased. However, too much price promotion may negatively influence the overall brand equity. Too frequent price promotions, or too deep price cuts, are likely to have a negative influence on the perceived brand quality. Furthermore, price promotion may also decrease the internal reference price in the customer's mind. It is advised that, for those brands with very high brand awareness, managers should not implement price cuts too frequently. Secondly, it is suggested that managers should increase the brand's distribution intensity to enhance both brand awareness and overall brand equity. For frequently purchased consumer packaged goods, distribution enhances brand awareness by providing brand exposure to consumers. Furthermore, the sheer shelf presence of the brand may generate product trial. Hence, managers should increase the distribution intensity of their brand.

Product innovation is an important method in enhancing brand equity, in addition to advertising and distribution, especially for a mature product category. However, as the previous managerial illustration indicates, the extent of "innovation" is critical for brands. The uniqueness of the new product enhances the brand equity. But, an innovative product would require a lot of advertising investment to frame and reinforce the product usage experience, and to "educate" consumers on this new product.

**Chapter Summary**

This chapter discussed the managerial implications provided by this current research. Essentially, it is suggested that revenue premium is a practical and convenient brand equity measure for managers to track the overall brand equity, especially for brands which do not have abundant financial and time resources to track the customer mind-set measures. However, as brand knowledge is the real source of brand equity, it is still advisable for managers to check the customer mind-set measure, if possible. In addition, managers could utilize the marketing activities data to predict the revenue premium measure and customer mind-set measure. The comparison of the predicted value and observed value would reveal either positive or negative deviation of the observed value from the predicted value. Those extreme deviations require further investigation into the marketing activities of this brand and the competitor's brand as well. Thirdly, feedback effects of product-market performance are essential in building brand knowledge. Product innovation and advertising campaigns are found to be important factors in amplifying the effects of consumers' brand usage experience. Furthermore, regarding

building brand equity using normal marketing mix elements, managers are advised to use price promotion with caution. Price promotion enhances brand awareness, but it has negative impact on brand equity in the long run. Finally, managers should also increase distribution intensity of the brand to provide brand exposure to consumers and generate sales.

# CHAPTER 7: CONCLUSION, LIMITATION AND FUTURE RESEARCH

This chapter concludes the thesis. In addition, it discusses the limitations of the thesis. And future research topics are explored.

## 7.1 Conclusions

In conclusion, the thesis offers a variety of contributions to both academia and business. Firstly, to the best of our knowledge, this study, for the first time, explores the differences, similarities and relationship between two types of brand equity measures, namely, customer mind-set measure and revenue premium measure. I utilize the framework of Brand Value Chain (Keller & Lehmann, 2003) to investigate the differences and relationship between customer mind-set measures and product-market performance measures of brand equity. Keller and Lehmann (2006) call for research to investigate the link between different types of measures of brand equity. This research is a step toward this direction. In particular, this study contributes to brand equity measure literature by studying and empirically testing theoretical similarities and differences between the two types of measures. Furthermore, the current analysis also lends empirical support to Keller and Lehmann (2003)'s Brand Value Chain model. For marketing practitioners, this research helps them understand discrepancies between customer mind-set measures and product-market measures, when different measures provide different information. By revealing the differences between brand equity measures, this study helps managers to choose appropriate brand equity measures for specific marketing purposes.

In terms of the relationship between the revenue premium and the customer mind-set measure, the empirical analyses confirm that customer mind-set and revenue premium assesses the same underlying construct, that is, brand equity. The impacts of marketing mix elements on both customer mind-set and revenue premium are similar. That is, advertising, distribution and price are positively associated with brand equity. And, price promotion is negatively related to the overall brand equity.

The thesis is also the first attempt to test the Brand Value Chain model proposed by Keller & Lehmann (2003). The empirical results illustrate that, for low-involvement frequently purchased consumer packaged goods, revenue premium (i.e., product-market performance) actually predicts the customer mind-set, which is contrary to the relationship proposed by Brand Value Chain (Keller & Lehmann, 2003). The finding has both academic and managerial implications. From the academic perspective, the findings suggest some alternatives to the Brand Value Chain for different product categories. The sequence of "marketing investment → brand affect →purchase behavior" may not be applicable for frequently purchased consumer packaged products, especially when the product-market is quite mature. In addition, our empirical findings also suggest a feedback loop from "brand market performance" to "customer mind-set". Product usage experience is essential for brands in building brand knowledge for consumers. And, advertising plays a role in reinforcing or framing the brand usage experience.

From the perspective of managers, the results indicate that managers should try to generate product trials. They are advised to use advertising to reinforce the product

experience in customers' minds in order to build the brand knowledge. In terms of the choice of brand equity measures, the revenue premium is demonstrated to be a practical and convenient brand equity measure for managers to track the overall brand equity of their brands continuously. The information revealed by the revenue premium is very close to the "true" brand equity of the brand. In addition, the revenue premium signals the problems of the brand earlier than the customer mind-set. Therefore, if managers only want to track and monitor the equity of their brand, the revenue premium is a practical and convenient choice.

Secondly, this study links the real marketing data with customer mind-set measures of brand equity. The impacts of multiple marketing mix variables (specifically, advertising, pricing, distribution and price promotion) on brand equity are investigated. Shocker, Srivastava and Reukert (1994) suggested that it is important to develop more of a "systems view" on how brand equity is being created by various marketing activities. This research is a step toward this direction. Only Yoo et al. (2000) have investigated the effects of multiple marketing variables (i.e., advertising, price deals, store image, price, and distribution image) on brand equity to date. However, the study of Yoo et al. (2000) is based on survey data, whereas the current study uses real market data. Furthermore, the results reveal the impact of marketing elements in building brand equity for marketing practitioners. Particularly valuable will be the information on the impact of price promotion on the two types of brand equity measures. For consumer packaged goods, price promotion has been widely implemented by marketing managers (Blattberg et al., 1995). However, price promotion is also criticized as it might jeopardize brand

equity. The current study provides an empirical study of the impact of price promotion on both customer mind-set and product-market performance measures. A negative impact association of price promotion with both customer mind-set measure and product-market performance measure is identified. Hence, managers are advised to use price promotion with more caution.

Furthermore, to the best of our knowledge, this study, for the first time, takes into consideration not only one but both of the accepted measures of brand equity, namely, customer mind-set and product-performance measures. Using both measures as dependent variables helps verify the robustness of the analysis results. Furthermore, this is the first time researchers are able to link real marketing mix element data with customer mind-set brand equity measures.

Finally, the current research not only investigates the overall brand equity measures, but also explores the brand awareness measure. Firstly, the thesis explores the relationship between the brand awareness and overall brand equity measured by both the customer mind-set and the revenue premium. In addition, the thesis also examines the marketing mix elements' impact on brand awareness, and compares the effects with those of the brand equity. Finally, a cross-prediction test between brand awareness and revenue premium is also conducted.

In the current literature, only Silverman et al., (1999) have tried to link brand awareness with brand valuation However, they found a very weak relationship between brand

familiarity and brand value. The brands used in their study are those corporate brands such as IBM, Cisco and Shell, which are well-known to respondents. But people who know those brands are not necessarily customers of those big brands. Therefore, a weak relationship between brand awareness and brand valuation is found.

In this study, brands at the product level are the focus of our study. Brand awareness is linked with the real performance of the brand in the market. It is found that brand awareness is both positively associated with customer mind-set and product-market performance (measured by revenue premium). Furthermore, the impact of marketing mix elements on brand awareness is different from their impact on overall brand equity assessment. Particularly, the results indicate that distribution is the most important element in increasing brand awareness, and price promotion has a positive relationship with brand awareness because it promotes product trial. However, advertising does not contribute much in increasing brand awareness. In terms of the cross-prediction tests, revenue premium (i.e., product-market performance) is found to predict brand awareness; hence, confirming the findings in the cross-prediction tests between revenue premium and customer mind-set. Thus, for low-involvement, frequently purchased consumer packaged goods, product trials are very critical in increasing brand awareness. The prior brand awareness may not be necessary for consumers in making purchase decisions. Consumers are likely to make purchase decisions while they are in the distribution outlets. Hence, the sheer shelf-visibility could generate purchases for consumers. The results further support the importance of distribution and price promotion in building brand awareness.

## 7.2 Limitation and Future Research

Though adding to our understanding of brand equity and measures of brand equity, this research has limitations that provide challenging avenues for further research. Firstly, there is an obvious need to replicate these results in other product categories, particularly those product categories that are growing and have many new product activities and advertising campaigns. In addition, it is advisable to replicate the results in high-involvement categories. For such product categories, consumers generally take time and energy to collect product information before making purchase decisions. The prediction relationship between the customer mind-set and the revenue premium might be different from what we have found in the thesis. We would expect to find the sequence of "marketing investment → brand affect → purchase behavior" sequence in those product categories.

Secondly, the feedback effects of product-market performance on customer mind-set should be investigated further in future studies. For instance, researchers could explore possible factors which might amplify or negate the feedback effects of market performance on customer mind-set. In the previous discussion in Chapter 6, several possible factors are proposed, including R&D, product quality, advertising, or perceived quality. This topic warrants further investigation.

Thirdly, the time periods of the dataset could be increased. Our dataset covers the time periods from January 2004 to December 2006. And, the variables are measured every six months. As brand equity is a long-run concept, the changes in brand equity might take a

longer time to surface. For instance, in our dataset, the brand equity is not found to erode over time for the aggregate data. If a longitudinal dataset covering a longer time period were used, we might have been able to identify the overall trend in the brand equity for the aggregate data. However, the practical difficulty in collecting customer mind-set data could be one of the major obstacles of such further research.

Fourthly, our operationalization of the price promotion variable could be improved. Our usage of the "percentage of sales made on price promotion" neglects the specific types of price promotion, such as the depth and frequency of price promotion. The information provided to managers is the association between the price promotion and brand equity. However, managers would not know how they should utilize the price promotion in terms of the depth and frequency. In future research, the depth and frequency of price promotion could be used as the variable to measure price promotion. In addition, future research could investigate whether there are threshold effects of price promotion on brand equity. Finally, non-price promotion such as contests, sweeptakes, free gifts and loyalty programs are also tools for marketing managers to generate product trial, provide brand experience and enrich brand knowledge for customers. Thus, effects of non-price promotion would be one of the future research avenues.

Finally, this study uses the overall measures of advertising expenditure and distribution intensity and relates them to the brand equity measures. In future research, researchers could investigate different media impact on brand equity with the purpose of identifying the most important media in building brand equity. And, such research could be

replicated in different product categories. Regarding distribution intensity, the effects of different distribution outlets on brand equity are also potential research topics. This research direction is especially relevant for high-involvement products which may require a fit between brand image and distribution outlets.

**Summary** The thesis explores the theoretical differences, similarities and relationship between two types of brand equity measures, namely the customer mind-set measure and the product-performance measure. In particular, the thesis investigate: 1) the correlation between the two types of measures; 2) which measure reflects the underlying brand equity construct better; 3) the impacts of marketing mix elements on the two types measures respectively; and 4) the prediction relationship between customer mind-set measure and product-market performance measure. The Brand Value Chain (Keller & Lehmann, 2003) and customer-based brand equity concept (Keller, 1993) are the major theory background utilized in this research. Two types of data, namely consumer survey data and marketing data from commercial sources are used for analyses. The findings, firstly sheds light on the underlying theory and relationship between two types of brand equity measurements and provides empirical test of the theory. Secondly, the thesis provides a systematic exploration of the impact of marketing mix elements on brand equity using real market data and two different measurements. Third, practical guidance for managers on how to choose a specific brand equity measures and how to track the brand equity measures over time for their brands are discussed.

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## Appendix:

### Table 1: Literature Regarding Marketing Mix Elements Effects on Brand Equity & Its Dimensions

| | | **Advertising** | **Distribution** | **Price** | **Price Promotion** |
|---|---|---|---|---|---|
| **Brand Awareness** | | (Aaker, 1991; Keller, 1993; Krishnan & Chakravarti, 1993; Rossiter & Percy, 1987; Yoo et al., 2000) + | (Aaker,1991; Keller, 1993; Smith & Park, 1992; Yoo et al., 2000) + | | |
| **Brand Image** | Favorability | (Edell & Moore, 1993; Farquhar, 1989; Kirmani, 1990; Kirmani & Wright, 1989; Kirmani & Zeithaml, 1993; Moorthy & Zhao, 2000; Nelson, 1974; Yoo & Donthu, 2001; Yoo et al., 2000)+ | | (Aaker & Jacobson, 1987; Keller, 2002; Nelson, 1974; Rao, 2005; Rao & Monroe, 1989; Tellis & Wernerfelt, 1987; Shiv et al., 2005; Yoo et al. 2000;) + | (Darke & Chung, 2005; Dodson et al., 1978; Doob et al., 1969; Guadagni & Little, 1983; Kahn & Louie, 1990; Kalwani & Yim, 1992; S. A. Neslin & R. W. Shoemaker, 1989; Raghubir & Corfman, 1999) -- |

Note: "+", positive; "–", Negative; "/", no effects.

**Table 1 Cont'd: Literature Regarding Marketing Mix Elements Effects on Brand Equity & Its Dimensions**

| | | Advertising | Distribution | Price | Price Promotion |
|---|---|---|---|---|---|
| **Brand Image** | Favorability | | | | (Villarejo-Ramos & Sánchez-Franco, 2005)+<br><br>Nelsin& Shoemaker, 1989; Ehrenberg et al., 1994): /<br><br>Grewal et al. (1998): mixed |
| | Strength | (Edell & Moore, 1993; Farquhar, 1989) + | | | |
| | Uniqueness | (Aaker & Shansby 1982;<br>(Boulding et al., 1994; Comanor & Wilson, 1974; Kaul & Wittink, 1995); +<br><br>(Prasad & Ring 1976;<br>Wittink , 1977) – | | | Mela et al. (1997) –<br>Boulding et al. (1994): mixed |
| **Brand Equity (Overall)** | | ( Ailawadi et al., 2003 ; Cobb-Walgren et al., 1995; Simon & Sullivan, 1993; Siram et al., 2007 ; Yoo et al., 2000;<br>Villarejo-Ramo & Sanchez-Franco 2005) + | Yoo et al. (2000) + | Yoo et al. (2000) + | (Yoo et al. 2000, Villarejo-Ramos & Sanchez-Franco, 2005) –<br>(Ailawadi et al., 2003 ; Davis et al., 1992 ; Siram et al., 2007) / |

Note: +, positive; --, negative; /, no effects.

## Table 2: Literature Regarding Price Promotion Effects on Brand Equity

| Paper | Effects | Product Category | Dependent Variable | Time Span | Findings | Theory |
|---|---|---|---|---|---|---|
| Dodson, Tybout and Sternthal (1978) | Negative | Margarine, flour | Post deal repurchase probability | 1963-1970 (8 years) | Retraction of deal decreases the repurchase probability for media-distributed coupons and cents-off marked in stores, but not for package coupons. | Self-perception theory |
| Gedenk and Neslin (1999) | Negative | Yogurt, mineral water | Feedback effect of price promotion on "brand loyalty" | Yogurt: 138 weeks; Mineral water:: 48 weeks | In store price promotions are associated with negative purchase event feedback compared to non-promotion purchase. | Self-perception theory; behavioral learning theory based on Skinner (1988) |
| Guadagni and Little (1983) | Negative | Ground coffee | After promotion repeat purchase rate | 32 weeks | Promotional purchase has a negative effect on subsequent purchase probability. | |
| Mela, Gupta and Lehmann (1997) | Negative | Customer packaged goods (non food products); specific product class not identified. | Price sensitivity | 8 years (long-term) | Price promotions increase customers' price sensitivity in the long run. Non-price promotions reduce price sensitivity for loyal customers but increase price sensitivity for non-loyal customers. | |
| Kalwani et al. (1990) | Negative | Ground coffee | Expected price; Probability of brand choice | 65 weeks ( 40 weeks for estimation) | Frequency of "promotion" has negative effect on expected price. | Adaptation level theory (Helson 1964); Reference price theory. |

## Table 2 Cont'd: Research of Price Promotion Effects on Brand Equity

| Paper | Effects | Product Category | Dependent Variable | Time Span | Findings | Theory |
|---|---|---|---|---|---|---|
| Lattin and Bucklin (1989) | Negative | Ground coffee | Reference price<br>Brand choice probability | 75 weeks | Too much promotion adversely affect customers' reference price and brand choice behavior. | Reference price |
| Papatla and Krishnamurthi (1996) | Negative | Liquid detergent | | 52 weeks | Loyalty was decreased by coupon purchase.<br>Price sensitivity was increased by coupon purchase. | |
| Shoemaker and Shoaf (1977) | Negative | Laundry cleaning products, disposable paper products, baking mixes, beverages | After deal repeat purchase rates | | The repeat purchase rate is lower if the previous purchase was made on deal. | |
| Villarejo-Ramos and Sanchez – Franco (2005) | Negative | Domestic equipment-washing machines | Perceived quality, brand image, brand equity | - | Price deals increase perceived quality;<br>Non significant association between price deals and brand image;<br>Price deals decrease brand equity. | |
| Yoo and Donthu (2000) | Negative | Athletic shoes, camera film and color televisions | Perceived quality; brand awareness/associations | | Price promotion is negatively related to brand equity. | |
| Darke and Chung (2005) | Negative | Service: hair stylist headphones | Perceived quality | | Price discount decreases perception of quality. | Self-perception theory;<br>Quality-price inference |

## Table 2 Cont'd: Research of Price Promotion Effects on Brand Equity

| Paper | Effects | Product Category | Dependent Variable | Time Span | Findings | Theory |
|---|---|---|---|---|---|---|
| Doob et al. (1969) | Negative | House brands: mouthwash, toothpaste, aluminum foil, light bulbs, cookies | Sales after retraction of low introduction price | Different time span for different products ranging from 3 – 20 weeks | After the retraction of low introduction price, the sales decrease. | Cognitive dissonance |
| Kahn and Louie (1990) | Negative | Shampoo product | Post promotion proportion of brand share (i.e., brand choice probability) | 60 decision series | For last purchase loyal customers, the promoted brand's share decreases after retraction of promotion. | Reference price theory, self-perception theory, economics of information. |
| Kalwani and Yim (1992) | Negative | Liquid laundry detergent | Brand prefernces, expected brand prices, brand choice | Experiemental design: 10 weeks | Both the price promotion frequency and the size of price discounts have a significant adverse impact on a brand's expected price. | Adaptation level theory |
| Raghubir and Corfman (1999) | Negative | Service: dentists, health clubs, mutual fund industry | Brand evaluation (professional, qualified, competent, reliable, busy, quality conscious, and well-known) | | Price discount affects brand evaluation unfavorably under some specific conditions:<br>a. if customers have not seen promotion before;<br>b. if it is not industry norm to have price promotion;<br>c. whether customers have little product knowledge. | Attribution theory; Price-quality inference. |
| Bawa and Shoemaker (1987) | No effects | Brand name and product class not identified | After promotion repeat purchase rate | | Probability of repurchase increases for non-user or infrequent user.<br>Probability of repurchase doesn't change for frequent users. | |

## Table 2 Cont'd: Research of Price Promotion Effects on Brand Equity

| Paper | Effects | Product Category | Dependent Variable | Time Span | Findings | Theory |
|---|---|---|---|---|---|---|
| Davis et al., (1992) | No effects | Experiment category: canned pasta, pain reliever, tooth paste; | Brand evaluation based on Farquhar (1989), including three components: affective, cognitive, and behavioral intention | 3 months | Absence of negative effects of promotion on brand evaluation. | |
| Ehrenberg et al. (1994) | No effects | Household customer packaged goods | Repeat-buying rate | One to three years | Price promotion didn't affect brand's subsequent sales or brand loyalty. | |
| Neslin and Shomaker (1989) | No effects | Regular and instant coffee | After deal repeat purchase rate | 108 weeks | Price promotion attracts many customers with low probability of purchasing the brand without promotion. After price promotion repeat purchase probability was brought down by this group of customers | |

## Table 2 Cont'd: Research of Price Promotion Effects on Brand Equity

| Paper | Effects | Product Category | Dependent Variable | Time Span | Findings | Theory |
|---|---|---|---|---|---|---|
| Boulding et al., (1994) | Mixed effects | Consumer packaged goods | Promotion effects on price elasticity | One year and half year lag effects of promotion | For firms with price above average, price promotion negatively affects price elasticity. For firms charging average price, no effects were found. For firms charging lowest price, price promotion has positive effects on price elasticity. | |
| Grewal et al., (1998) | Mixed effects | Bicycle | Perceived quality, reference price | | Price discount decreases buyer's internal reference price, but it is not significantly related to perceived quality. | |
| Palazon-Vidal & Delgado0Ballester (2005) | Positive effect | Chocolate | Number of brand associations, valence of brand associations, uniqueness of brand associations. | | Monetary promotion increases the number of brand associations and the number of net positive brand associations. | Brand Knowledge theory. |

**Figure 1 - 22: Time Trend Customer Mind-set/Revenue Premium at Individual Brand Level**

**Figure 1: Brand A Customer Mind-set Trend**

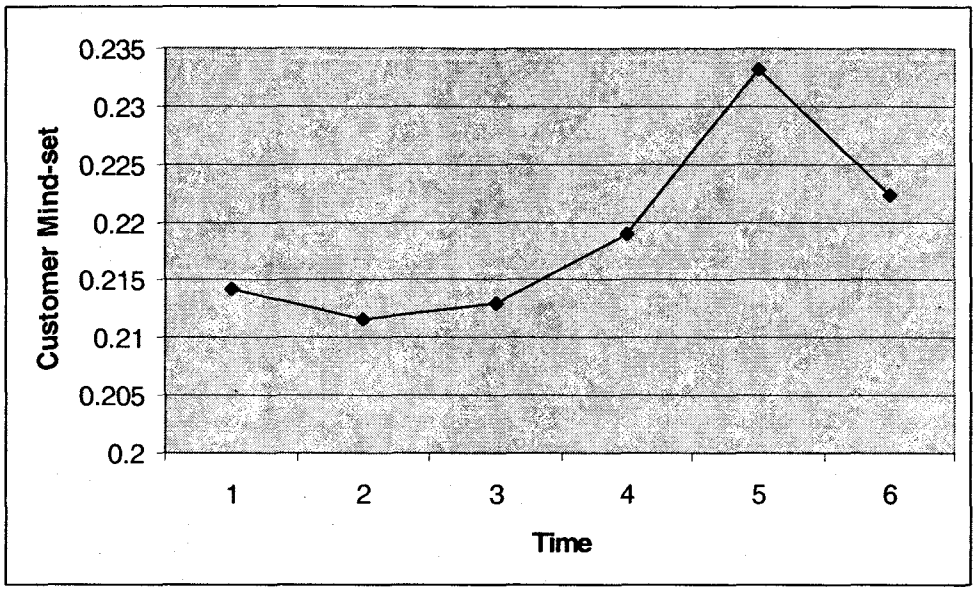


**Figure 2: Brand A Revenue Premium Trend**

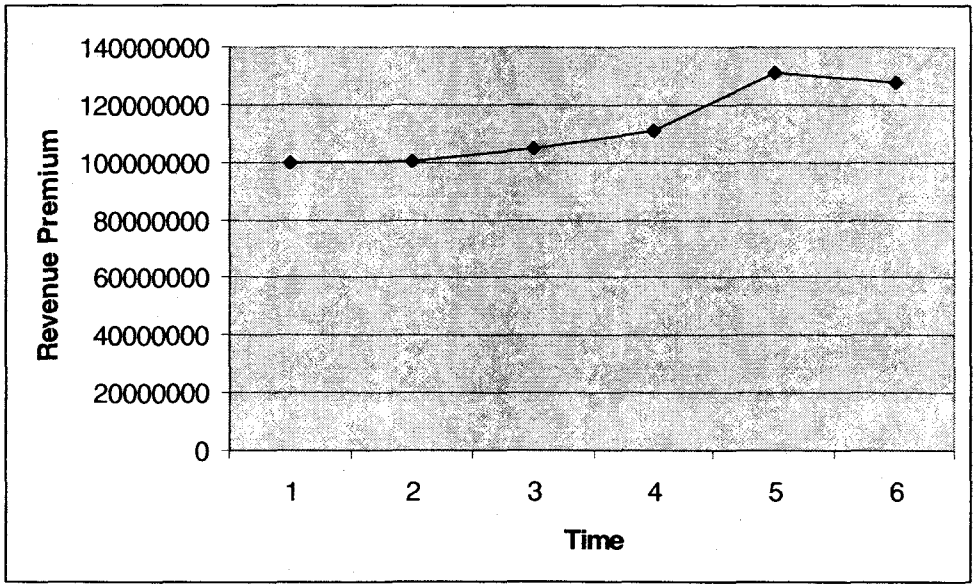

**Figure 3: Brand B Customer Mind-set Trend**

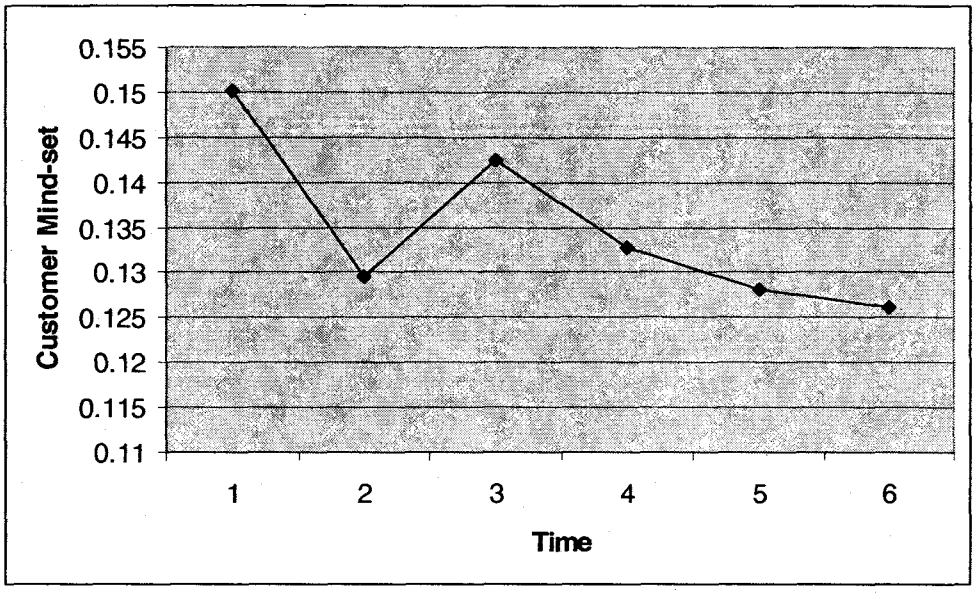


**Figure 4: Brand B Revenue Premium Trend**

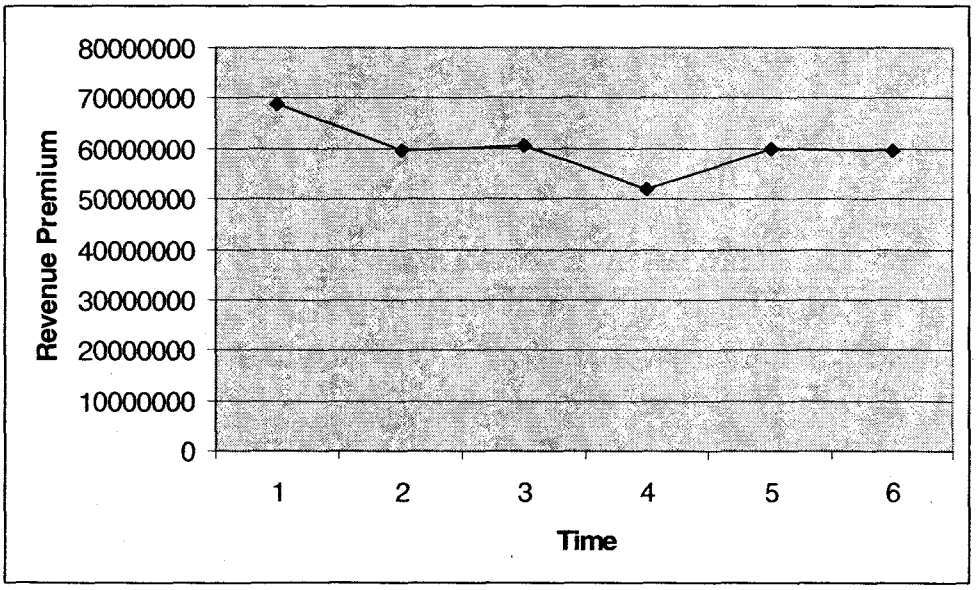

**Figure 5: Brand C Customer Mind-set Trend**

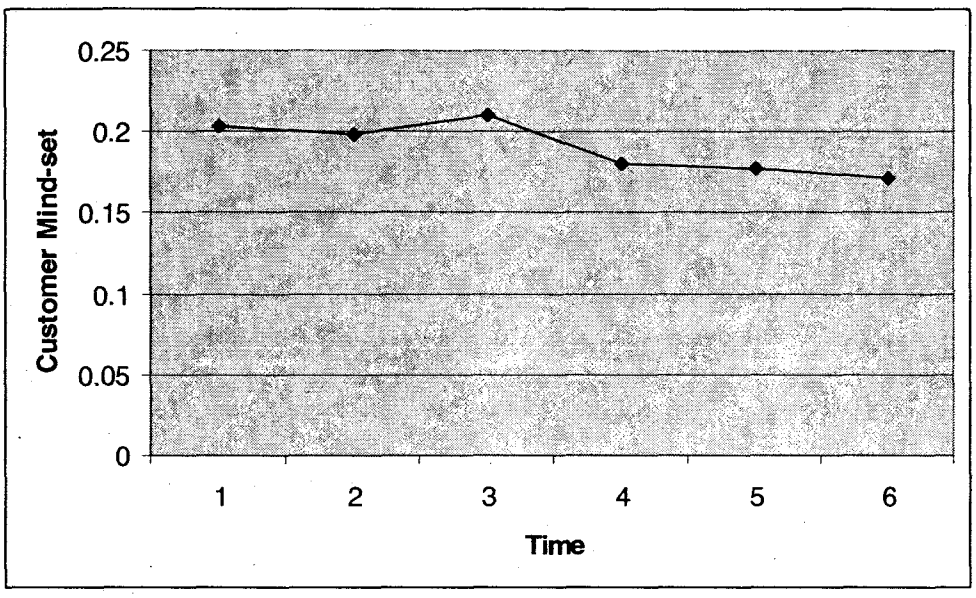


**Figure 6: Brand C Revenue Premium Trend**

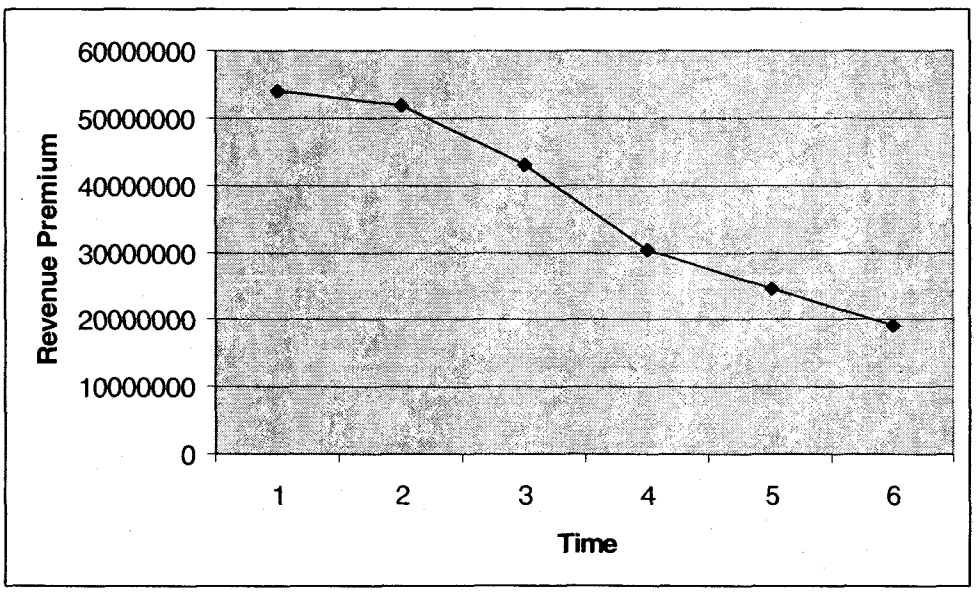

**Figure 7: Brand D Customer Mind-set Trend**

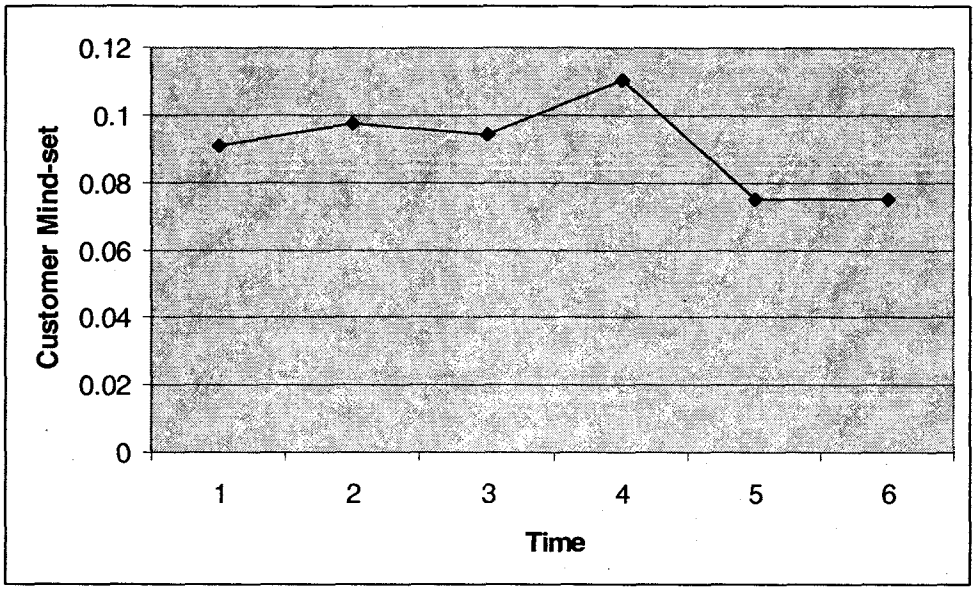


**Figure 8: Brand D Revenue Premium Trend**

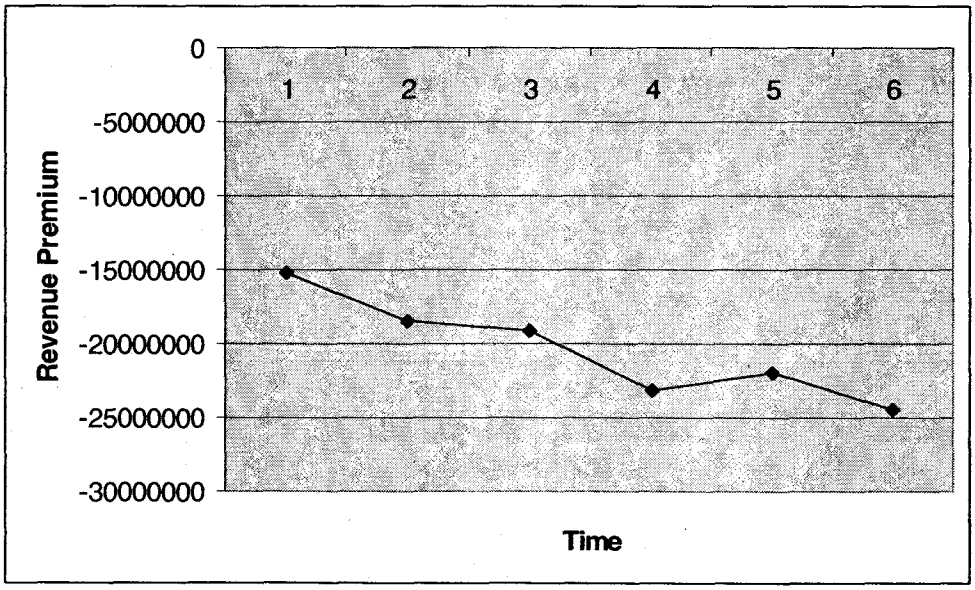

**Figure 9: Brand E Customer Mind-set Trend**

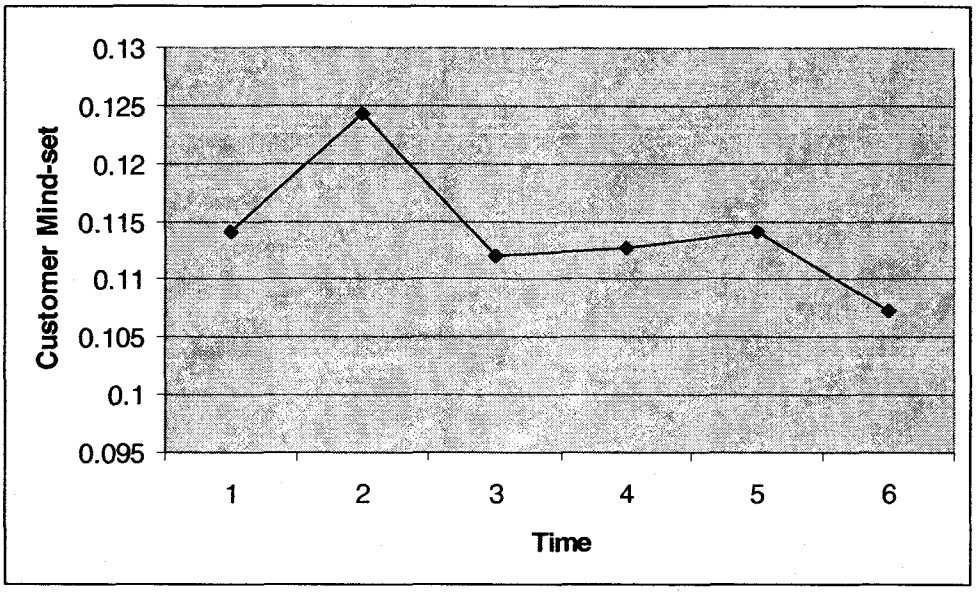


**Figure 10: Brand E Revenue Premium Trend**

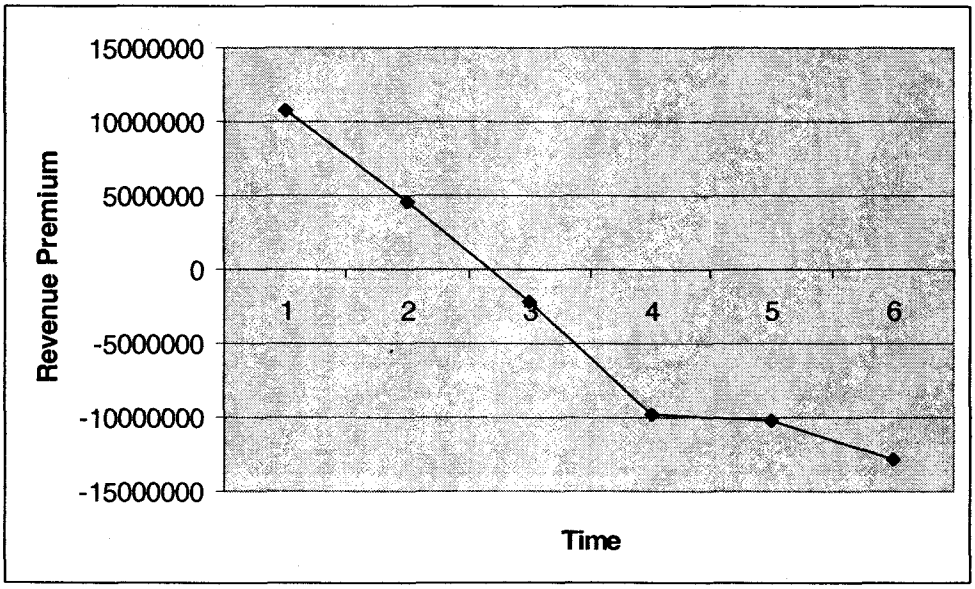

**Figure 11: Brand F Customer Mind-set Trend**

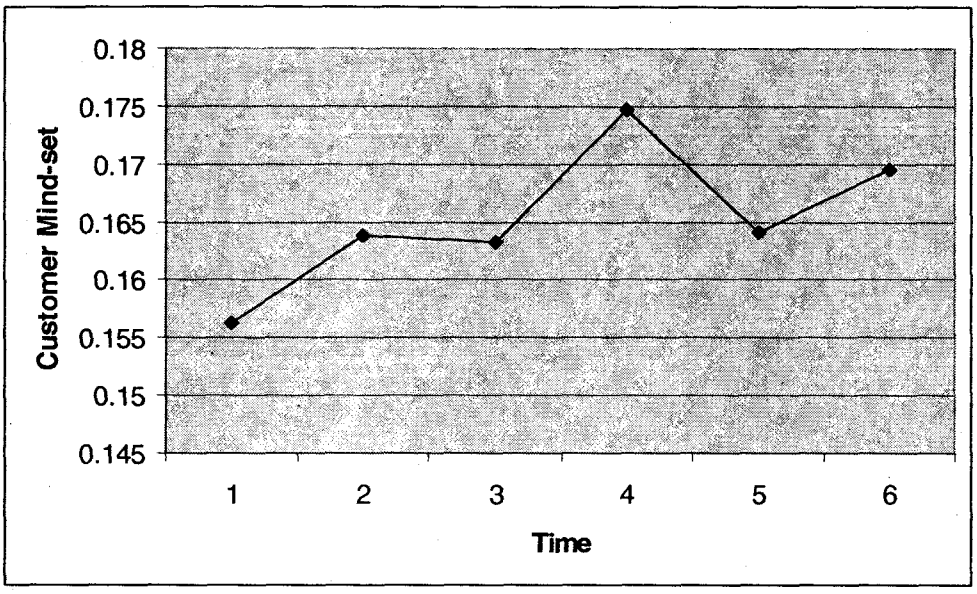


**Figure 12: Brand F Revenue Premium Trend.**

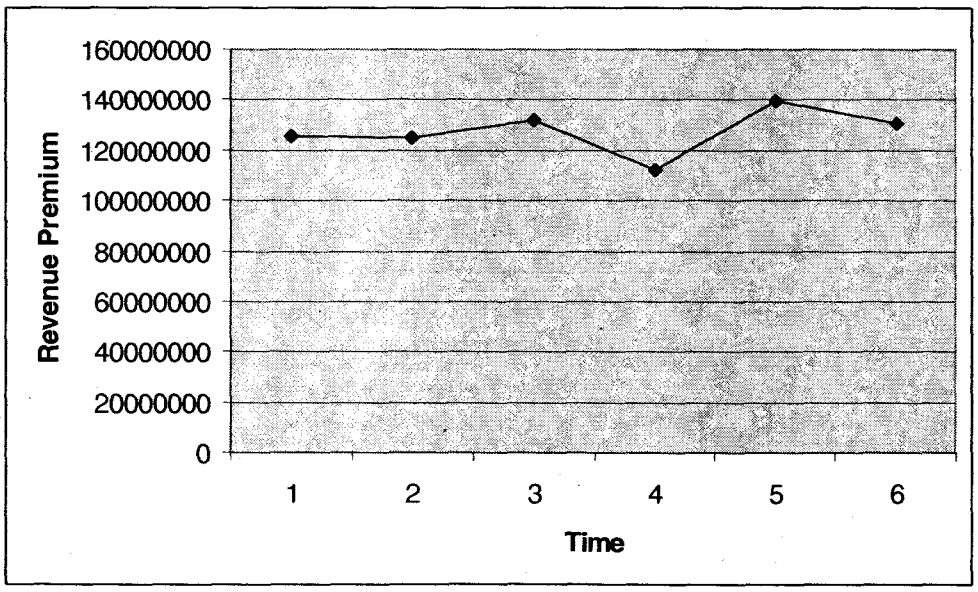

**Figure 13: Brand G Customer Mind-set Trend**

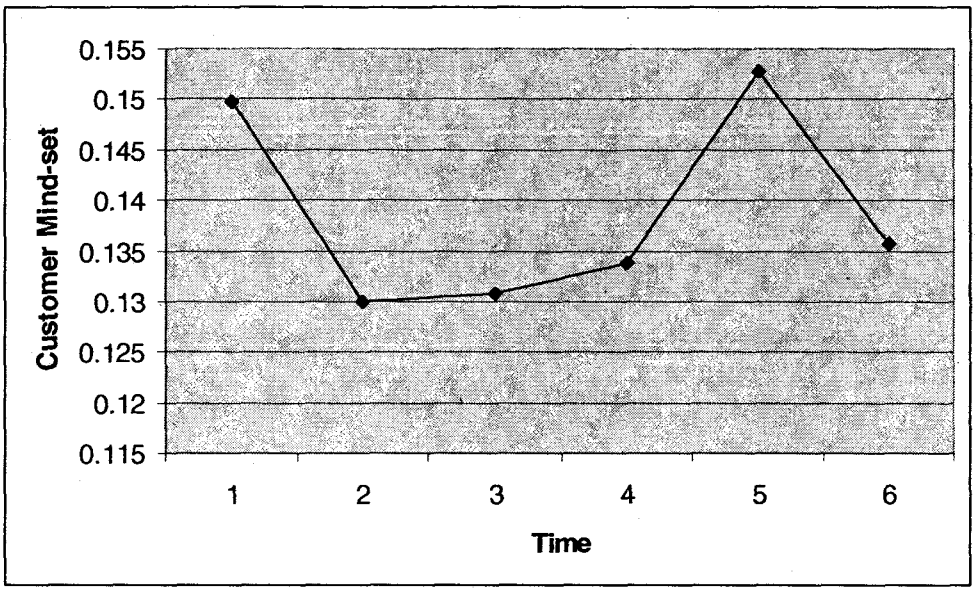


**Figure 14: Brand G Revenue Premium Trend**

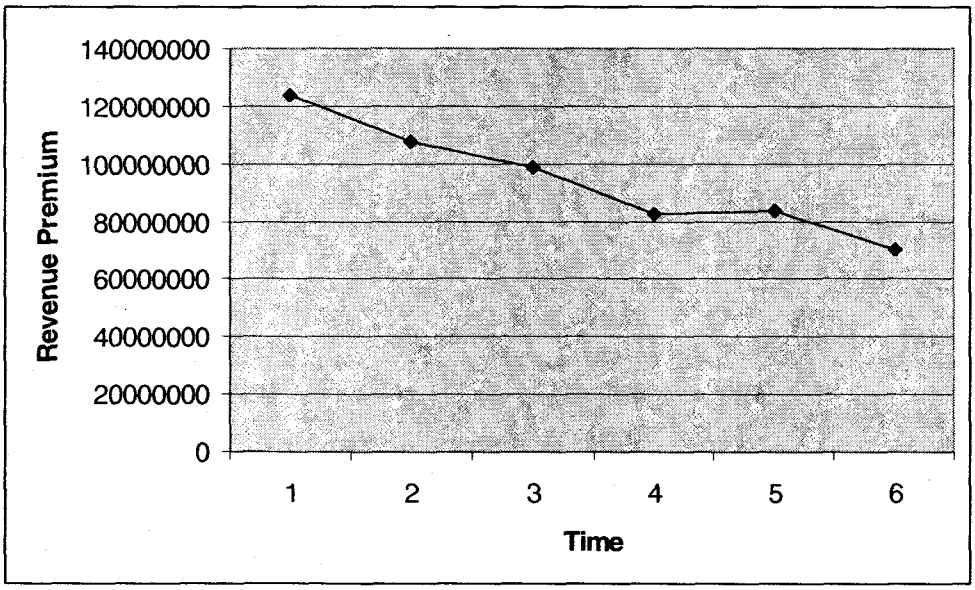

**Figure 15: Brand H Customer Mind-set Trend**

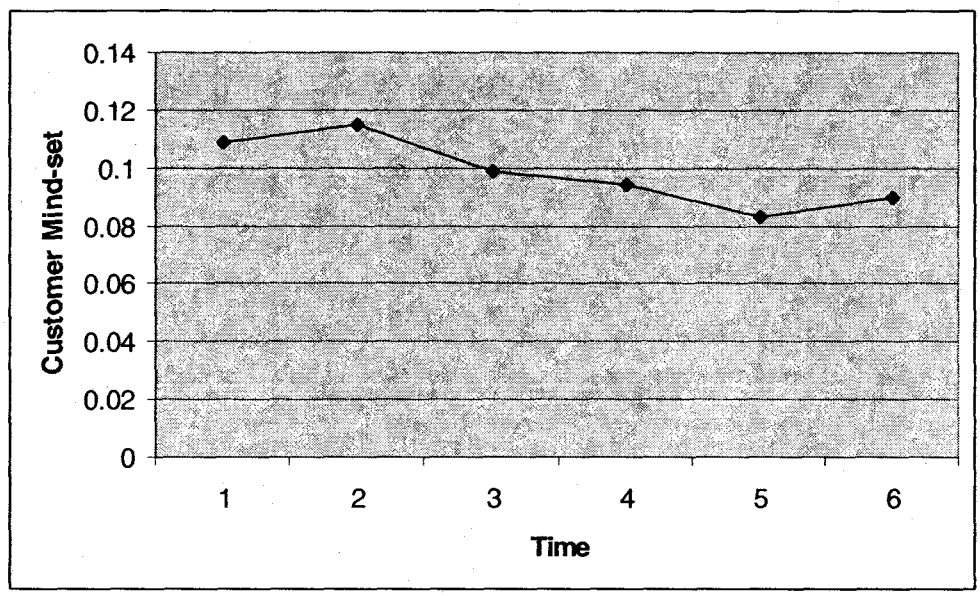


**Figure 16: Brand H Revenue Premium Trend**

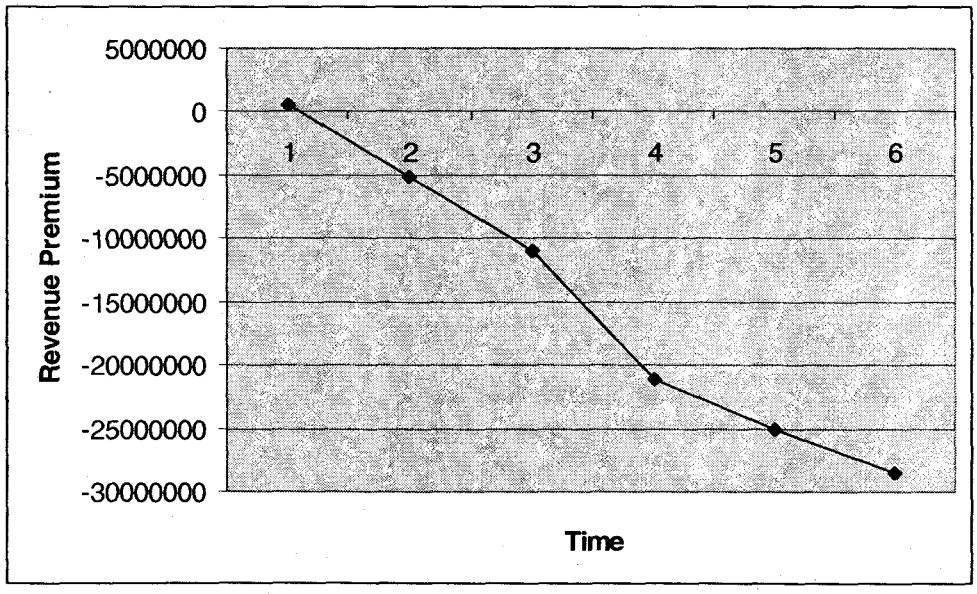

**Figure 17: Brand I Customer Mind-set Trend**

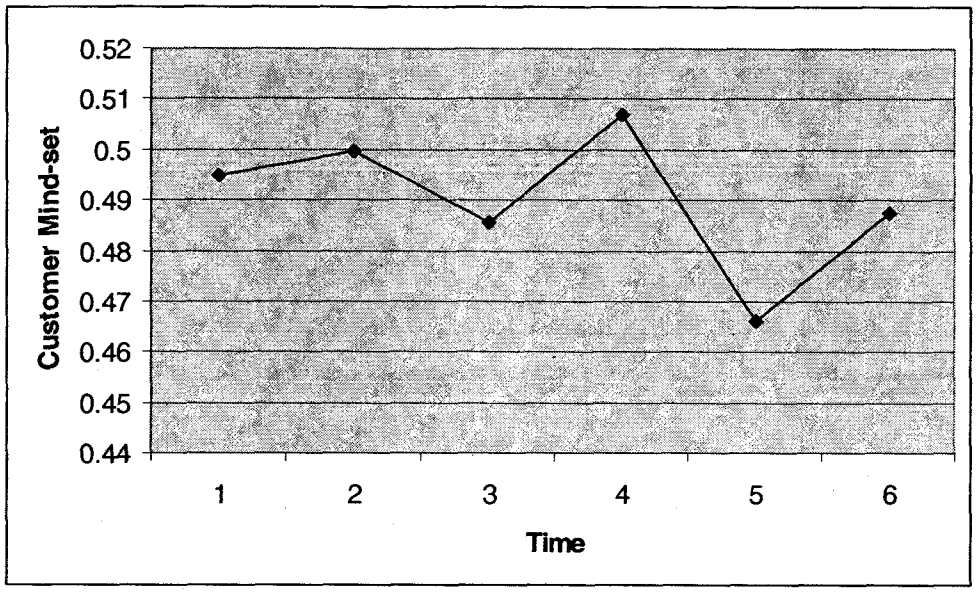


**Figure 18: Brand I Revenue Premium Trend**

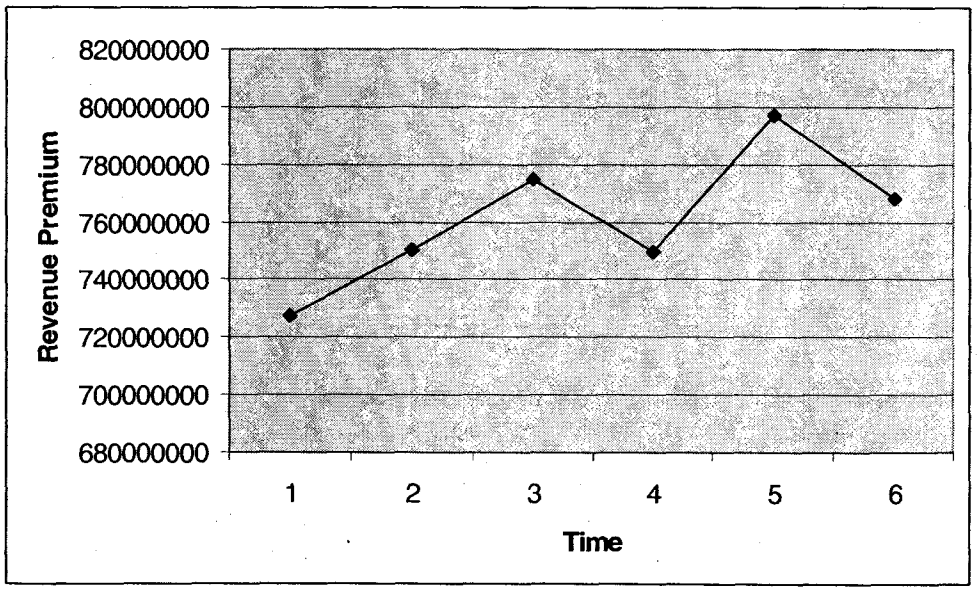

**Figure 19: Brand J Customer Mind-set Trend**

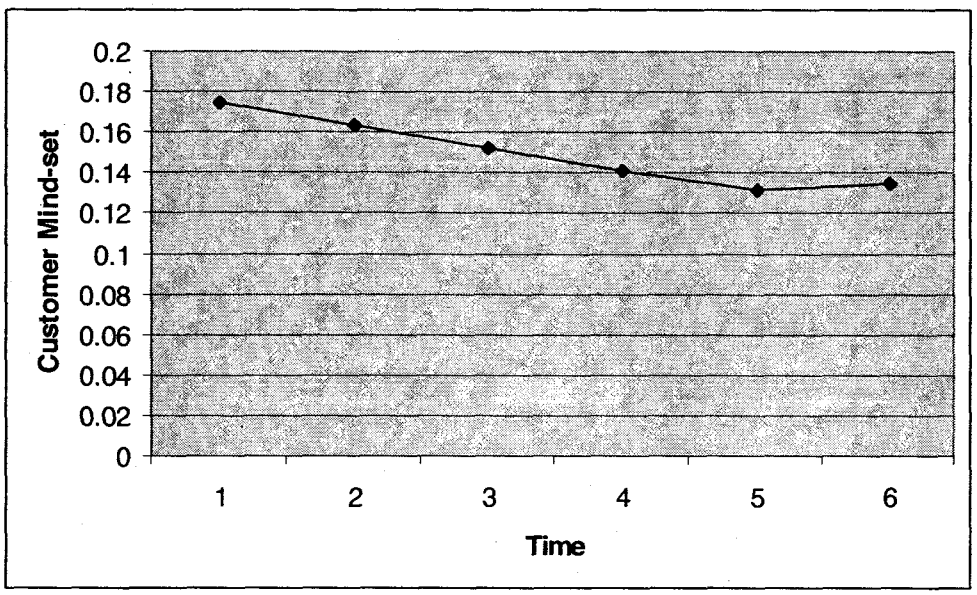


**Figure 20: Brand J Revenue Premium Trend**

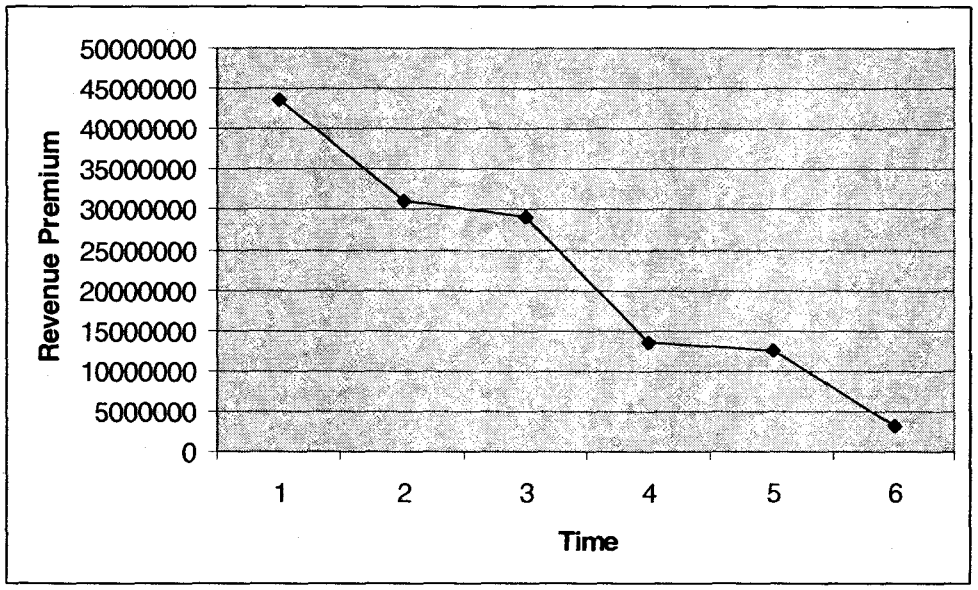

**Figure 21: Brand K Customer Mind-set Trend**

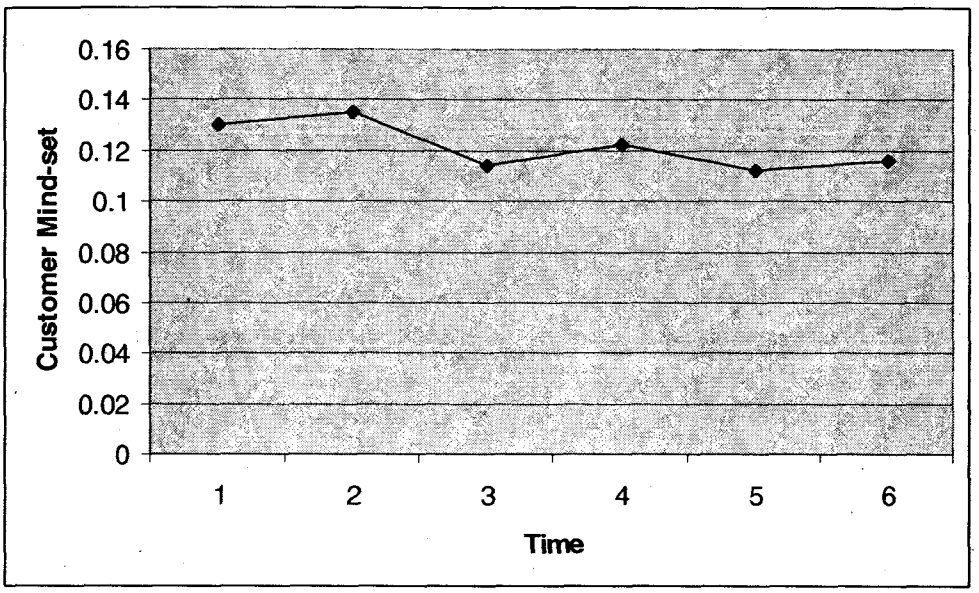


**Figure 22: Brand K Revenue Premium Trend**