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Reference Price Conceptualisations: An Integrative Framework of Analysis

The notion of reference price is becoming more popular in modelling price effects on consumers' purchasing behaviour. In order to understand the formation of reference price, an integrative analysis of the different concepts of reference price is proposed here. We present a classification of some twenty-six different concepts of reference price, based on an analysis of the different cognitive processes involved in the different conceptualisations. In addition, similarities and differences between the different concepts are examined. Finally, we consider utilization of particular reference price concepts in reference price modelling as well as in managerial decisions pertinent to various market situations.

Keywords: reference price, pricing

Introduction

The role of reference price in consumer behaviour, as part of behavioural pricing research, has been the subject of increased attention in the recent past (Winer 1986; Hardie, Johnson, and Fader 1993; Rajendran and Tellis 1994; Gurumurthy and Little 1994; Monroe and Lee 1999; Mazumdar and Papatla 2000). Reference price can be defined as "*an internal price to which consumers compare observed prices*" (Winer 1988, p. 35). In other words, it is believed that consumers possess a reference price, which is based either on their previous experience (Winer 1986; Lattin and Bucklin 1989), external cues such as advertised price (Biswas and Blair 1991) or contextual effects (Rajendran and Tellis 1994; Hardie, Johnson and Fader 1993). Empirical findings in the literature support the notion that consumers behave as if they had a reference price to which they refer in their decision process (Kalyanarm and Winer 1995). These findings also show an increase in the predictive power of choice models that incorporate reference price as compared to price-only models (Winer 1986, 1989; Lattin and Bucklin 1989; Kalwani et al. 1990; Mayhew and

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Winer 1992). The conceptualisations of reference price rely on a substantial body of behavioural literature that examines the relationship between new point information (i.e. actual price) and established reference point information (i.e. reference price). Webber-Fechner Law, Adaptation-Level Theory (Helson 1964), Assimilation-Contrast Theory (Sherif 1963), Prospect Theory (Kahneman and Tversky 1979), and Mental Accounting Theory (Thaler 1985) all provide theoretical support to the notion and interpretation of reference values.

A conceptualisation of reference price most commonly encountered in the literature is that in which the consumer relies on past experience with the product by using either the last price paid or some sort of weighted average of past prices (Winer 1986, Winer 1989; Lattin and Bucklin 1989; Kalwani et al. 1990; Rajendran and Tellis 1994). This conceptualisation of internal reference price was found to be significant in predicting consumer choice in the category of repeatedly purchased products (Briesch et al. 1997). While the literature recognizes the importance of incorporating reference effects in modelling consumer choice behaviour, little has been done to either identify or classify the different concepts and operationalisations of reference price or to reveal their relevance to various market conditions.

The purpose of this paper, therefore, is to offer an integrative framework for analyzing the different concepts of reference price. In particular, we aim to: 1) identify the different cognitive processes involved in different conceptualisations, 2) indicate similarities and differences between different concepts and 3) suggest some implications for future utilization of reference price concepts in reference price modelling as well as in managerial considerations applicable to varying market settings. The latter is of particular importance since the real world exhibits market-to-market variation in terms of consumer, product and macroeconomic characteristics. We also address Winer's (1988) call for better understanding of what is the "right" reference price theory to choose from and under what conditions is one theory better than the other.

The remainder of the paper is divided into two major parts: The first includes a section that presents a review of the different concepts of reference price that are used in modelling reference price effects; a section that reviews other reference price concepts found in the literature; and a section that includes an analysis of the different concepts according to the different cognitive processes involved. The second part involves an examination of the relevance of different reference price concepts to various market situations. We begin this latter part with a section that considers market variation and its relation to reference price. We continue with a section that examines three market variations and the relevance of various reference price concepts. We conclude with a section devoted to an analysis of marketing implications,

and a section of summary and final conclusions that includes indications for further research.

The Formulation of Reference Price

Various conceptualisations of reference price can be found in the literature, ranging from an advertised price, (i.e. an external conceptualisation), to a log-weighted mean of previous purchase price, (i.e. an internal conceptualisation). The main objective of identifying the different conceptualisations is to better understand how consumers use reference price in their evaluations. Aside from questioning consumers directly regarding the price they expect to pay on their next shopping trip (Kalwani and Chi Kin Yim 1992; Urbany and Dickson 1991), all other methods use estimation procedures to predict the reference price. A log-weighted mean of prices paid or observed by consumers for a specific brand size on past purchase occasions was a method used by Kalwani et al. (1990). Jacobson and Obermiller (1990) used a type of serial correlation regression that models price expectations as a function of current price and unobserved factors. Biswas and Blair, (1991) used the advertised price for the product as an external reference price to which consumers compare actual prices. Marketers can influence consumers' internal reference price by manipulating the external reference price. Acknowledging that there is a positive correlation between external reference price manipulation and the internal reference price through consumers' evaluations of normal and fair prices, presenting external reference prices to consumers can create such manipulation (Lichtenstein and Bearden 1989; Urbany, Dickson and Wilkie 1989). Contextual effects such as consistency and distinctiveness also affect consumers' price-related evaluations, providing marketers with the opportunity to advertise and manipulate the external reference price of a specific brand among a set of brands (Lichtenstein, Bloch and Black 1988; Lichtenstein, Burton and Karson 1991).

Another method modelled consumers' perceptions of the current price of a brand as a function of the most recent price observed and a trend of the brand's price over time (Winer 1986). Utilizing two different reference price concepts in forming a reference price is the recent development in the literature. Using the last price paid by consumers as an internal reference price and the last nonspecial price as an external price, Mayhew and Winer (1992) modelled consumers' choice and showed that both were significant. Rajendran and Tellis (1994) used a weighted average of contextual and temporal reference prices to come up with a single reference price in a choice model. The last price paid served as the temporal price, while the lowest shelf-price of any brand in the category represented the contextual effect.

Ghose and Lowengart (1998) used an extreme value reference price formation to model the effect of reference price on consumers' choice. The maximum and minimum prices paid by consumers were used to represent these extreme values. Another type of weighted average - exponential smoothing - of last promotional and regular prices paid by consumers was used by Lattin and Bucklin (1989). Winer (1989) used the last paid price as an estimate of reference price. A different approach for reference price conceptualisation based on the Reference Dependence Theory (Tversky and Kahneman 1991) was used by Hardie, Johnson and Fader (1993). In this context a single reference price is used to evaluate all alternatives where the current price of the last purchased alternative was used as a single reference price. A one-period lagged logarithm of price paid by consumers on previous purchase occasions was used by Krishnamurthy, Mazumdar and Raj (1992).

Thus, it is evident that the internal reference price concept has gained popularity in the literature and also provides more accuracy in predicting consumer behaviour (Briesch et al. 1997). It can also be seen that most reference price formulations are based on consumers' past experience with the product category. Though there is no evidence on *how* the process of reference price formation is actually constructed, there is empirical evidence that in their choice evaluations consumers, behave *as if* they possess such a reference price (Kalyanaram and Winer 1995). This empirical evidence, however, has some inherent disadvantages in the way the reference price was conceptualised. For instance, most internal reference price studies used a memory-based conceptualisation such that the expected reference price of the coming purchase is based on past paid prices. A typical mode that captures this phenomenon (e.g. Lattin and Bucklin 1989) takes the form of:

$$RP^i_{t+1} = \eta RP^i_t + (1-\eta)P^i_t \qquad (1)$$

where:

RP^i_{t+1} - is the reference price consumer *i* has in mind for the next purchase occasion.

η - is the memory parameter that reflects the carryover of exposure to price information from purchase occasion *t* to purchase occasion *t+1*.

RP^i_t - is the reference price consumer *i* had in mind on purchase occasion, *t*.

P^i_t - the price consumer *i* paid on purchase occasion, *t*.

Table 1. Concepts of Reference Price

1.	Normal or standard price, (Scitovsky 1945-1945; Della Bita, Monroe, and McGinnis 1981) - "*The range of prices normally charged by retailers when the product is not on special"* (Urbany and Dickson 1991, p. 46). It can be used by consumers as base for judgments of other prices in the context of Adaptation Level Theory (Emory 1970). "*a range of expected marketplace prices*" (Lichtenstein and Bearden 1989, p. 56).
2.	Average price of similar products - It is believed that consumers develop an internal reference price based on the average price of similar goods. This range can shift up and down depending on the prices of the different products and can increase due to a shift of the lower end toward the mean, or an upper shift of the prices from the mean. The latter has a greater impact on this range of prices which is supported by Weber's Law, (Emory 1970; Gabor 1977).
3.	Last price paid - In this concept it is assumed that inferences about a new price would be based on comparing it to the last price paid for that product. It would serve as a reference level for evaluating future price changes (Scitovsky 1945; Gabor and Granger 1966; Monroe 1971). "*The price of the last purchase as remembered represents the price image of the good concerned, and it can be of great importance to the price setter to know how it compares with the actual price, since this will indicate how the market will respond to a price adjustment*" (Gabor 1977, p. 188).
4.	Price most frequently charged (Olander 1970) - This concept assumes that consumers develop a mental frequency distribution of previous prices they have paid for a specific product. The mode of this distribution is what is called price frequently charged (Winer 1988). This concept differs from the concept of average price of similar products because the latter remains within the category of similar products.
5.	Price of most frequently purchased brand - Applied when consumers try to measure the quality of a product based on the price of another product of the same category. It is assumed that this price represents a reference level for comparison. (Gabor and Granger 1961).
6.	Reservation price – "*the maximum the individual would pay*" (Thaler 1985, p. 205), or the price just low enough to overcome her reservations about purchasing an extra unit. In other words, reservation price can be measured by the marginal utility of the product divided by the marginal utility of money. This reflects the value of consuming an additional unit of a specific commodity in monetary terms. Beyond this price, the consumer views the good as not worth its value (Scherer 1980) or "*the most I would ever pay*" (Klein and Oglethorpe 1987, p. 183).
7.	Perceived price - "*Relative to both what is known of other prices, as well as the significance attached to the associated use-values*" (Emory 1970; Della Bita and Monroe 1974; Monroe 1973).
8.	Evoked Price (Rao and Gautschi 1982).
9.	Fair price (Scitovsky 1945-1945; Gabor and Granger 1966; Monroe 1973; Kamen and Toman 1970; Winer 1988). This price should reflect consumers' beliefs on how much a product should cost, or its worth "*buyers' perceptions of a seller's costs will strongly influence their judgments about what price is fair...*" (Thaler 1985, p. 206). "*A reasonable price*" (Klein and Oglethorpe 1987, p. 183). "*a comparison of the perceived value for the money with perceived quality of the product*" (Lichtenstein and Bearden 1989, p. 57).
10.	Price limits – Consumers have a range of acceptable prices, "*the lowest and highest prices that buyers are willing to pay for a particular good or service*" (Monroe 1990, p. 490).
11.	Good buy price - "*The price I would considered as a good buy*" (Klein and Oglethorpe 1987, p. 183). **Cont'd/**

12.	List price (Klein and Oglethorpe 1987).
13.	Lowest market price (Monroe 1990). "*consumer perceptions of the lowest prices exist in the market*" (Lichtenstein and Bearden 1989, p. 56).
14.	Highest market price (Monroe 1990).
15.	Aspiration price - "*The price I would like to pay*" (Klein and Oglethorpe 1987, p. 183).
16.	Market price - "*The average retail price*", "*a particular price I'd seen or heard*" (Klein and Oglethorpe 1987, p. 183), or the market average (Sampson 1964, p. 100).
17.	Historical price- Relates to the prices consumers paid on previous purchasing occasions. This might be the average price, last price, or "*the price I usually pay*" (Klein and Oglethorpe 1987, p.183).
18.	Expected current price (Winer 1986 1988; Kalwani et al. 1990) - The expected price on the current purchasing occasion. It is believed that consumers not only develop an internal reference price for comparison tasks, but they also make assumptions about future prices. This concept was examined in terms of sensitivity to promotion frequencies and depth of price discounts (Kalwani and Chi Kin Yim 1992).
19.	Just price - It is "just" that price or below it that consumers are prepared to pay (Winer 1988). This concept represents a level of prices that is permanently in the memory of most consumers and represents what products "ought to cost" (Gabor 1977).
20.	Ordinary price (Liefeld and Helsop 1985) – can be viewed as respondents' estimate of the normal price that the advertising merchant charged for the product (Lichtenstein and Bearden 1989).
21.	Lower threshold - This concept can serve as a reference price by setting a lower limit to which new prices are compared. This lowest price represents the perception of lowest acceptable quality (Monroe 1973; Winer 1988).
22.	Expected future price - The expected price to be charged on the next purchasing occasion (Jacobson and Obermiller 1990). Expectation of future price trends, based on consumers' experience (Emory 1970).
23.	Advertised seller's price – The individual store's advertised price is used as a reference price to compare with the actual price (Biswas and Blair 1991).
24.	Other stores' price – The price advertised at other stores for the same product can serve as a reference price against the advertised price of a specific store (Biswas and Blair 1991).
25.	International reference Price – "*an external reference price that reflects the price of the product in different countries*" (Lowengart and Mizrahi 2000, p. 526)
26.	Customary price - a single price which consumers consider paying for a specific product (Monroe 1973). A price of 25c for a candy bar is an example for this concept that reflects consumers' single price level experiences. "*prices set by custom, tradition, assumed consumer psychology and other non-objective* means" (Shapiro 1968, p. 17).

Such formulation entails that there is a constant update of the reference price based on previous paid prices. It is also assumes a constant updating across all consumers. Perhaps the more important limitation of such an approach is the heavy use of scanner data in applying such a reference formation process. Specifically, assuming that consumers shop only in one type of shopping environment (i.e. large grocery store chains) all the time, exposed to a steady pricing scheme, and ignoring consumers' expectations about the cost of the retailers in different environments can lead to biases in estimating consumers' reference price. An understanding of the origin of the various concepts of reference price as well as understanding their limitations might

help marketers in better utilizing this notion. In the following section we provide a detailed review and analysis of the various concepts of reference price.

Reference Price Conceptualisations

The different representations of reference price that were found in the literature are presented in Table 1. These representations are evaluated with respect to their dimension and relevance for different market variables, as discussed later on.

In summary, it can be seen that the proliferation of reference price conceptualisations indicates the complexity and multidimensionality of price in consumers' evaluations. In addition, it highlights the importance researchers place on capturing alternative meanings of price. Consequently, there is a need for classification and understanding of the suitability of the different concepts to specific marketing problems. Thus, we analyze these concepts in conjunction with the different cognitive processes involved, to determine the relevance of each concept to different situations.

Analysis of the Different Reference Concepts

Consumers establish a reference price by referring to personal experience such as purchases, observations, intentional and non-intentional exposure to price information, price of comparable products, or their own subjectively perceived value of the product. Along these lines, the twenty-six concepts that are capable of serving as reference prices are evaluated in this section. The differences and similarities, as well as the cognitive processes associated with these concepts, are the guidelines for this comparison.

The first distinction in this analysis is based on the differences in the information gathering stage in the reference-price formation process. There are two kinds of information usage in this process: external and internal. *External reference* price refers to information gathered from the environment, external to the person. Specifically, the source for forming a reference price in this case is based on prices advertised by different stores, manufacturers' advertisements, manufacturers' suggested list price, international reference price, as well as other information cues. An *internal reference* price refers to a process that takes place internally, in the consumer's mind, by means of experience and judgment. The process of reference price formation in this context is through observations on and information from the environment. Although internal judgments of reference price seem to be equally based on previous experience, there is an important distinction to be drawn. Internal reference price based on past experience refers only to what happened *before* the current purchase: any potential information encountered *after* the latest

purchase is ignored and disregarded, and the expectations formed regarding future purchases disregard both information and experience accumulated since the last purchase of a unit. Consequently, internal judgments of product prices, although affected by previous experience, are different in the sense that they incorporate current information into future expectations.

A second line of distinction in the analysis is between *behavioural* and *judgmental* internal processes that form the reference price. Behavioural reference price formation involves the consumer's personal experience with the specific product, as well as the whole product category. Consequently, another distinction is noted, between *direct past experience* and the *processing of information* gathered in the store during the purchasing incident. *Direct past experience* refers to consumers' personal experience in terms of the prices they paid in the past. It also reflects consumers' ability to store in memory and recall price information (Krishna, Currim and Shoemaker 1991; Dickson and Sawyer 1990). *Processing* of currently stored information refers to the process of evaluating prices of other products in the same product category.

Judgmental reference price formation, however, refers to the process of forming expectations. Specifically, this process includes interpreting new information and assigning it meaningful representations, i.e. integrating and / or comparing it with previous knowledge stored in memory, as a basis for attitude formation. The result of this cognitive process is the construction of a specific behaviour applied to purchasing decisions. The process of judgmental reference price formation can be further partitioned into three distinct processes according to the underlying criterion of judgment: product value, price centricity or boundary factors. *Value-based reference price formation* involves past experience with the product's attributes as well as an assessment of the monetary value of the product, resulting in some ratio of attributes to price. *Central tendency-based reference price formation* involves an assessment of future and current prices of the product based on some distribution formation of the specific price and of other products in the same category (Emory 1970; Gabor 1977; and Liefeld and Helsop 1985). This reference price represents some sort of a mean or a mode of this distribution. *Boundary based reference price formation* involves the self-imposed limitations of consumers with respect to the price they think they should pay. This is carried out either by imposing an upper boundary (reservation price) that reflects the maximum worth of the product compared to other products in their consumption basket, or by setting a lower boundary that reflects the belief that below a certain price level the quality of the product is questionable (Monroe 1990).

Distinguishing between the various processes enables us to sort the multitude of concepts into meaningful groups. In Figure 1, we categorize the different reference price concepts according to the different processes.

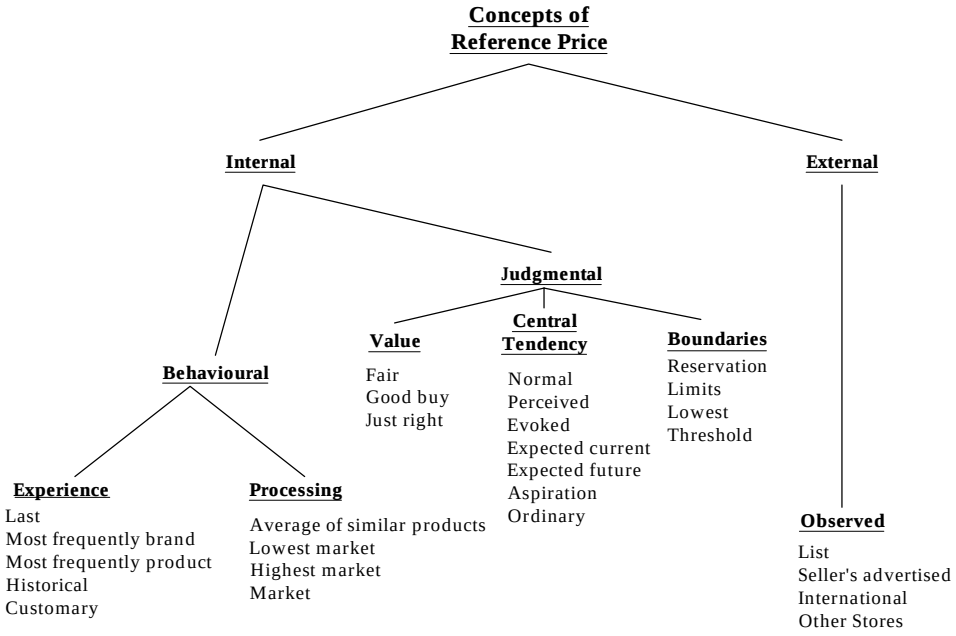


Figure 1. Classification of Reference Price Concepts

This classification highlights the fact that most of the literature is primarily concerned with internal reference prices. In particular, judgmental reference price aspects are the most commonly cited form of conceptualisation, emphasizing the significance of judgments in consumers' purchasing decisions (see for example Monroe 1990, p. 63, and Nagle 1995, p. 309, Thaler 1985). Although past experience is of great importance for the decision making process, it is probably not the sole factor in the purchasing decision. Consumer judgments that incorporate past experiences and result in some sort of evaluation process, offer greater insight into the issue of the concept's formation. The main advantage of the judgmental reference price formation is the ability to consider consumers' future behaviour not only through past purchasing analysis but also through expectation modelling (a similar approach for the case of market structure can be found in Srivastava, Leone, and Shocker 1981).

Market Variation and the Appropriate Reference Price Concept

There is a rather universal agreement that using the price variable only to model consumers' behaviour is insufficient. This is true for estimating demand functions (Sorger 1988, Kopalle and Winer 1996; Greenleaf 1996; Kopalle, Rao, and Assunção 1996) or estimating consumers' choice

probability for selecting a particular brand out of a set of possible brands (Winer 1986; Lattin and Bucklin 1989; Kalwani et al. 1990; Mayhew and Winer 1992; Hardie, Johnson, and Fader 1993; Rajendran and Tellis 1994; Kalyanarm and Winer 1995; Mazumdar and Papatla 2000).

Our earlier discussion revealed the existence of twenty-six different concepts of reference price. In addition, their origin is rooted in different behavioural constructs. The large number of different reference price concepts raises the issue of the *appropriateness* of a specific concept to be employed in any type of model. Thus, whether it is choice modelling, demand estimation or theoretical investigation of reference price effects on product evaluations, such as its value (Monroe and Chapman 1987; Grewal, Monroe and Krishnan 1998) or any type of external manipulation (Compeau and Grewal 1998), one needs to understand which concept to use. Since various concepts are the results of various cognitive processes that are based on certain theories with various assumptions, it is clear that not all concepts are appropriate for each market condition. Thus, variations in the external context (e.g. economic environment) and in consumer's characteristics (e.g. level of involvement with the product category) put some restrictions on the suitability of various concepts of reference price to be employed in any type of analysis. This variation can raise a question such as what is the "right" reference price concept to choose. Although it is clear that it is an important issue in the reference price research area, this question has remained unanswered. Such a question becomes even more important if we consider the wide market-to-market variation in terms of macroeconomic stability (i.e. inflation, exchange rate), heterogeneity among consumers (i.e. behavioural, personal, and demographic variables) or product variability (i.e. durable vs. nondurable products). Since real-world markets vary substantially (e.g. inflation, etc.) it is worthwhile examining whether certain specific operationalisations of reference price would be more or less appropriate under different market conditions. In the following sections we present several variations that can have an effect on appropriateness of the type of reference price concept that should be used.

The Effect of Contextual Factors on Reference Price Concept Selection

We can consider different situations in which some of the reference price concepts may be more suitable than others in the consumer's decision making process. For example, for repeatedly purchased goods, it is more likely that consumers will use behavioural aspects of reference price (i.e. use their own experience in product evaluations). The level of product involvement might determine whether a processing phase will be initiated.

Consequently, we can develop some guidelines as to the most appropriate concept of reference price that might be used in this context to better capture the relevant cognitive process. We propose here an integrative approach by analyzing several variations in market conditions and exemplify it through: 1) differences in consumers' characteristics (i.e. shopping patterns and product involvement), 2) macroeconomic environment (i.e. inflation and consumer spending power), and 3) product characteristics (i.e. durable versus frequently purchased goods, and quality levels).

Consumers' Heterogeneity

Let us consider a case where consumers buy a frequently purchased product at both supermarkets and convenience stores. It is apparent that their expectations with respect to the price anticipated would differ according to the specific situation. Consequently, behavioural reference prices might be biased upward or downward based on the purchasing price history. In such a case, we should look for a concept that can keep the characteristic of intransitivity and can consider a judgment approach that takes these issues into account. Centrist judgments suffer from intransitivity across different shopping environments. Specifically, an attempt to evaluate a centrist tendency across different modes of distribution would involve data pooling and evaluation of a mix of distributions rather than a single one. To estimate the central tendency of different distributions at different shopping environments would be an enormous cognitive effort for the consumer, thus making this approach susceptive to biases when using it in different shopping environments (Zeithaml 1988).

Evaluating prices based on the product value, however, can be invariant across shopping environments, as long as consumers incorporate different cost structures attached to each shopping environment (Thaler 1985). Consider for example the task of assessing the fair price of a can of soda in two different purchasing environments, a vending machine and a supermarket. It is reasonable to assume that selling a can of soda in a vending machine involves a higher level of costs, since the soda is refrigerated and there is a special service person who takes care of the machine and loads it frequently with small quantities. These aspects are different in a supermarket, and the costs associated with selling a can of soda there are lower than in the vending machine. Thus, when assessing the fair price for these two different environments, it is expected that consumers would anticipate different prices. Consequently, the criterion of product value remains invariant across situations.

Boundary factors are also not dependent on the purchasing environment. Applying higher and lower boundaries to a purchase incident is dependent

upon the product and not the environment. Setting a price limit of $1.50, for example, for a can of soda represents the highest price a specific consumer may be willing to pay for the product. This reservation price is also independent of shopping environments.

In summary, we can see that when there is heterogeneity in consumers' shopping environments, the boundary and value aspects of judgmental internal reference price can better represent this notion.

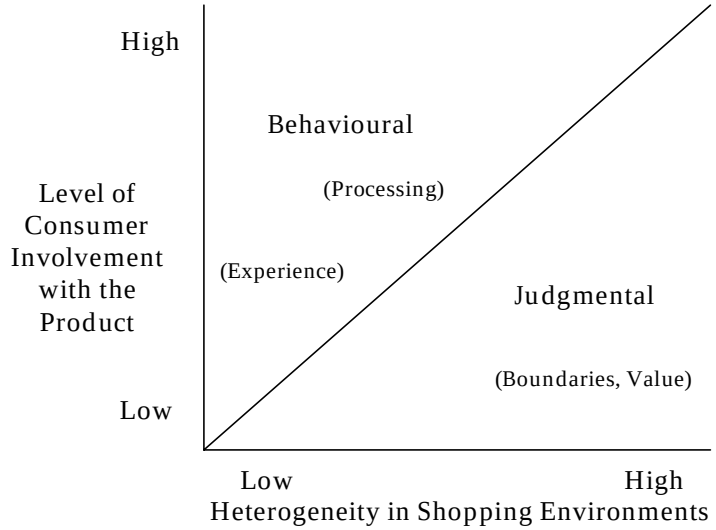


Figure 2. Heterogeneity in Consumers' Involvement with the Product Category and in Shopping Environments.

We may add another dimension to this analysis and consider differences in the level of product involvement across consumers (Kotler 2000), and capture both consumer and shopping heterogeneity. As the level of involvement with the product category increases, consumers are more likely to search for more information (Assael 1987). Consequently, high involvement consumers might better recall prices paid in the past than those consumers who have low level of involvement with the product category. Indeed the literature indicates that some consumers may favour price-comparison while shopping (Marmorstein, Grewal, and Fishe 1992) while other consumers may not favour it (Doti and Sharir 1981). Murthi and Srinivasan (1999) found that marketing mix variables (including price) had no effect on more than 40% of consumers' purchase occasions. Urbany, Dickson and Kalapurakal (1996) found that consumers have difficulty in recalling prices of low value products such as grocery products. These findings indicate heterogeneity in

the way consumers use past price knowledge and information in their purchasing decisions. As a result, several reference price concepts can be used under these scenarios while others might create bias once using them as a proxy for reference price formation processes. Figure 2 represents the two scenarios of different shopping environments and consumer heterogeneity. In order to provide useful diagnostics utilizing this analysis, we constructed a scenario with the two contrast directions for both variables (i.e. high vs. low involvement and stable vs. rapidly changed (high) shopping environments).

Several implications can be drawn using this framework. If consumers generally shop in grocery stores (i.e. relatively stable shopping environment); behavioural reference price concepts are more suitable. In such an environment, experience-based reference price types (i.e. last price, most frequently charged, historical or customary) should be used for the low involvement segment of the population and processing-based concepts (i.e. lowest and highest prices, market price) when product involvement is high. Thus, when marketing low involvement products such as salt, marketers can indicate the general *customary* price for the category and indicate their brand's price. If it is a high involvement product, marketers can indicate *current* price as an attractive one, capitalizing on the idea that consumers use other price information in their evaluations. When the shopping environment changes relatively quickly in terms of shopping habits (i.e. consumers purchase at different stores with different cost structures), judgmental-based concepts should be used. Specifically, the higher consumer involvement in the product category, the more consumers employ *value*-based type of comparisons. Thus, marketers can indicate their cost level or the special treatment or service they provide to consumers (i.e. cost level). Based on our analysis of these conditions, we can formulate the following research propositions:

P1 the greater the heterogeneity of consumers' shopping environments, the more appropriate judgmental reference price concepts are.

P2 the higher consumer involvement with the product category, the more appropriate are behavioural reference price concepts.

Macroeconomic Environment

Another distinction in the market environment can be represented in the form of instability of prices. The importance of reference price conceptualisation in such cases can be illustrated with the following simple aggregate linear demand function:

$$Q = \alpha + \beta P + y(P\text{-}RP) \quad (2)$$

Where:

Q - is the market demand for a certain product.
P - is the actual market price.
RP - is the reference price.
α, β, y are the demand function parameters

Let us consider the case where there is a rather high inflation rate (i.e. frequent price increases) in a given market. Using behavioural reference price concepts to capture the reference price notion in Equation (2) will result in a significant bias in any type of analysis (i.e. choice and demand estimations). Namely, the continuous price increase will result in a continuous loss since the price, P will always be higher than the reference price, RP, as described in Equation (1). Note that this loss can be the result of inflationary factors only and not the result of a particular pricing strategy. Consumers in such market conditions, however, form expectations and use some sort of inflation adjusted mechanism to get the real price. Such mechanisms of expectation formation were investigated in the economics literature. These include, for example, interest rates inflationary expectations (Hirshleifer 1980) or seasonal effects for advertising expenditures (Franke and Wilcox 1987). Another aspect of gradual price changes is the stage of the product in the product life cycle (PLC). Dolan and Simon (1996, p. 292) provide several examples for price decline for consumer durables with deeper price declines for recently developed products such as cellular phones (30% decline in three years) or CD players (20% decline in six years). As a result, internal behavioural price representations cannot capture consumer's inflationary expectations. It is apparent that in this scenario the relevance of external reference price increases. Under such conditions, consumers are more likely to rely on a market, or behavioural, aspect of reference price instead of using their own internal knowledge of the price paid in the past. Similar problems can also occur when modelling price dynamics (Hanssens, Parsons, and Schultz 1990).

Another macroeconomic variable that can have an impact on the relevance of a particular representation of reference price is consumer spending. In this scenario, consumers are likely to switch to relatively more expensive substitutes, for example from bread to croissants (Friedman 1990). Therefore, consumers will have little experience with historical prices in the new category. Under these conditions, it appears that the relevance of external information cues such as reference price increases. These differences are presented in Figure 3.

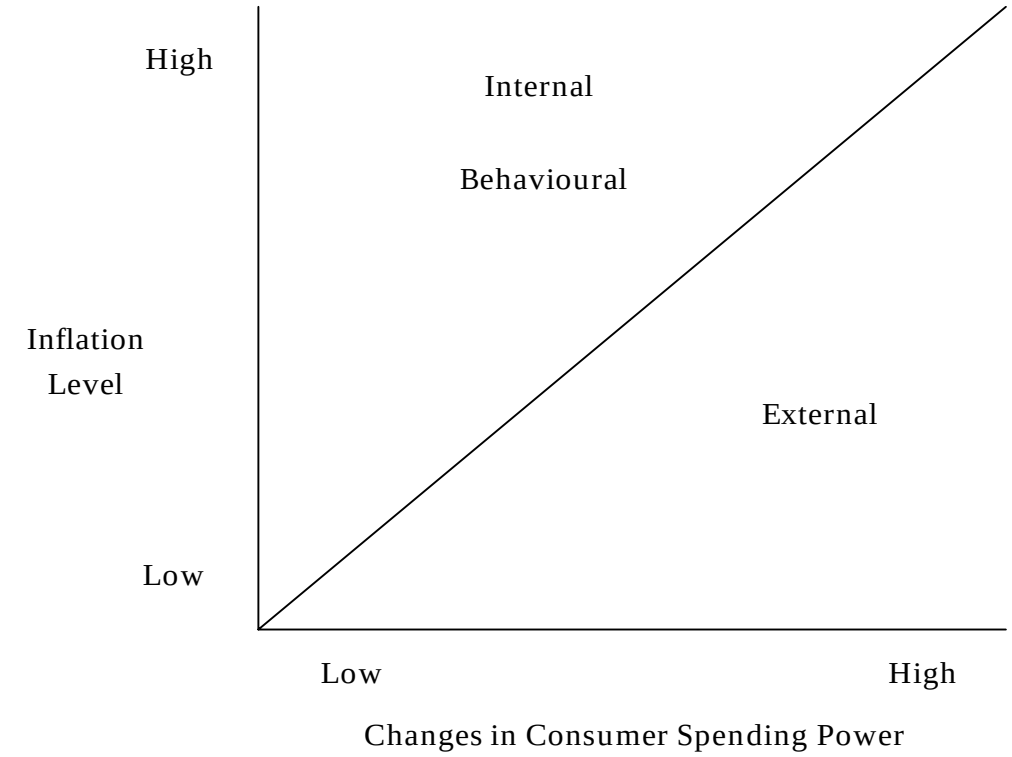


Figure 3. Macroeconomic Variables Effect on the Relevance of Different Concepts of Reference Price

Several implications can be drawn from this analysis. If consumers are enjoying increased spending power as a result of new jobs or other significant changes in income, marketers can use external reference price concepts to create favourable judgments by consumers. When the inflation rate is high, marketers can be competitive with the market or average prices and highlight this information to consumers. Similar conditions were explored by Lowengart and Mizrahi (2000) when they examined the circumstances for a retailer to apply international reference price (the price of the same product at different countries). They showed that instability of economic markets combined with an easy access to information (i.e. Internet) motivate consumers to seek price information and retailers to provide information that will serve their causes.

Based on our analysis of these macroeconomic conditions, we can formulate the following research propositions:

P3 the greater consumer spending power, the higher the use of external reference price.

P4 the higher the inflation rate, the higher the use of internal behavioural reference price concepts.

Product Characteristics

The last scenario that we consider here is differences in product characteristics: durable versus frequently purchased goods and search quality versus previously experienced goods (Nelson 1970). When considering product characteristics, it is reasonable to assume that for durable products, the relevance of internal reference price in general will decrease and for frequently purchased goods the relevance of external price will increase, because consumers can rely on their experience with historical prices. Indeed, the reference price literature has ample empirical evidence that consumers use internal reference price to evaluate the actual product price (Gurumurty and Winer 1995). It should be noted here that there is almost no research on consumers' reference price for durables. Thus, a theoretical exploration is needed to shed more light on the relevance of the different reference price concepts for such product categories.

When considering the nature of the product's quality (i.e. is it possible to evaluate the product before purchasing), the relevance of internal judgmental reference price increases in the case of search quality products. Unlike experienced quality goods where consumers need product experience to infer quality (i.e. some food items, fragrance), in search quality products the quality can be verified before using the product (e.g. clothing). Thus, when purchasing experienced quality goods, consumers will be more likely to use external cues such as external price information to infer about product quality. The literature that examines the relationship between price and quality is extensive and started many years back. These literatures postulate that price can serve as a proxy to product quality when consumers do not have full information about the product (Scitovsky 1944-1945; Gabor and Granger 1966). Researchers were also able to determine upper and lower price bounds where consumers will not purchase the product. It is either too expensive (i.e. reservation price - upper bound) or to "cheap" (lower bound), which can lead consumers to infer that quality is very poor (Monroe 1971).

When integrating the literature on the different product characteristics and the nature of the product quality, several inferences can be made. First, in nondurables, consumers can engage in a process of evaluating several reference prices. For example, consumers can evaluate a retailer advertisement about the product, which can include price information (i.e. external reference price). They can also search for information (Murthi and Srinivasan 1999) and use competitors' price information (advertised or sticker prices) for price comparisons and use some internal judgmental reference price for that purpose (e.g. reservation, good buy) for search quality products. Or, consumers can use their own experience with the product category when it comes to experience quality products. This,

however, is not sufficient since some uncertainty still exists (i.e. quality is verified after purchasing) thus some judgment on "how good the price is" remains. Therefore, consumers may use, again, a combination of several types of reference price (e.g. last price, normal). Second, in durables the experienced quality type products indicate that consumers use external cue information to eliminate most of the product quality uncertainty. Thus a use of external reference price will contribute toward this end. In search quality products, consumers rely on other cues (i.e. touching the cloth) and can infer about the product quality. Thus, consumers may make judgments about the worth of the product quality which can result in the utilization of internal judgmental reference price. Figure 4 summarizes this scenario.

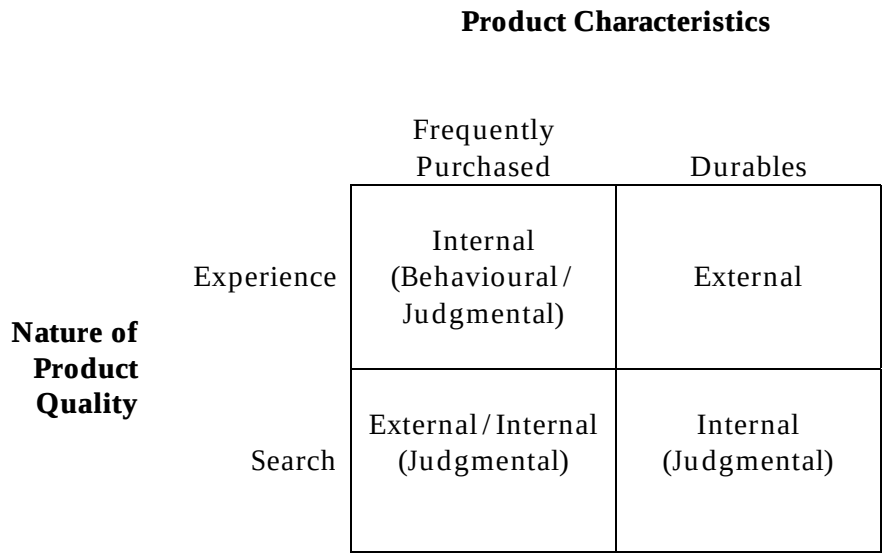


Figure 4. Product Characteristics' Effect on the Relevance of Different Concepts of Reference Price

Several consequences can be drawn from this analysis. When it comes to durables, it seems that marketers need to provide consumers with more information, in general. This is true regardless of the nature of the product. In the case of experience goods, this should take the form of supplying price information in addition to quality information. Thus, enhancing the price-quality relationship, on one hand, and crating a reference point (i.e. price) in consumers' evaluation process of other competing products. In search quality products marketers can provide information of competing product price that can also include inferences about the *value* of the product (e.g. how much consumers pay for the product quality). This will favourably enhance

the judgmental process toward their brand. Where frequently purchased products are concerned, similar information can be supplied, but marketers should acknowledge that consumers also rely on their previous experience with the product. Thus, marketers need to handle the external reference price with much care and not to create inconsistencies between consumers' internal and external reference price. It should be noted that marketers can influence the internal reference price (i.e. increase it) by providing a *plausible* external reference price and can even enhance the value perception of the product by providing other external cues (Biswas et al. 1998). Marketers can also provide *implausible* external reference price information and try to influence even more heavily consumers' internal reference price. The exact result of such activity has not been fully resolved in the literature such that some studies indicate negative effects of such activity, while others suggest a positive effect (Urbany, Beardon, and Weilbaker 1988; Lichtenstein, Burton, and Karson 1991; Biswas et al. 1998).

Based on our analysis of the different characteristic of these products, we can formulate the following research propositions:

P5 consumers who purchase **search** quality durable products will use judgment-based internal reference price in their valuation.
P6 consumers who purchase **experienced** quality durable products will use external reference price in their valuation.
P7 consumers who purchase frequently purchased products will use both external and internal reference prices in their valuation.

Some support for research proposition 7 can be found in Rajendran and Tellis (1994) when a dual reference price model that included both internal (behavioural processing) and external (lowest shelve price) reference prices was used to model consumers' purchasing behaviour.

Marketing Implications

Marketing implications drawn from our analysis can be summarized along the three different types of analyses conducted in the previous sections.

1. Macroeconomic Environment:

When the inflation rate increases and consumers cannot rely on their experience with historic prices and engage in an inflation adjustment process to evaluate prices, marketers should supply price information cues in the form of external prices. This can take the form of suggested list price, or advertising the product's qualities. Furthermore, marketers can add comparison information to indicate the competitiveness of their offer

compared with that of competitors. Since consumers are uncertain of the price they will be asked to pay in their next shopping environment, marketers can help consumers with the evaluation process and influence them to favour their brand.

When a certain segment in the population experiences an increase in spending power and switches to more expensive items within a specific product category, marketers, again, should supply external price information cues to facilitate the consumer's valuation process of the product's qualities.

2. Differences in Product Characteristics:

In the case of durable products, consumers have little knowledge of past prices, and even when they have some concept of past prices; it is probably not very useful, since the product's features have most likely changed. Consequently, the role of external reference price increases. Thus marketers can supply price information in a manner that will favour their product offering. Information such as "Regularly priced at ___, now only ____" messages can create such attitude toward a product.

In the case of repeatedly purchased goods, behavioural reference price is more likely to be used with quality search characteristics. Thus, marketers would probably benefit from constant price strategy (i.e. $P_{regular}$), such as Every Day Low Prices, (EDLP), and should not use heavy price promotion tactics (i.e. $P_{promotion}$), to avoid establishing a low reference price in consumers' minds. Such pricing strategy will limit the loss effects that will appear after a price promotion (i.e. *losses* > *gains*) and prevent the expected lower new reference price when consumers adjust their reference price based on the paid lower-promoted price. This is the result of the fact that

$$P_{regular\,=\,pre\,promotion} > P_{promotion}$$

and when using Equation (1) as an updating mechanism for reference price

$$RP_{pre\,promotion} > RP_{after\,promotion}.$$

Using this relation in Equation (2) will lead to the result that

$$Q_{pre\,promotion} > Q_{after\,promotion}$$

(the same qualitative result will prevail regardless of the updating mechanism for reference price).

In the case of repeatedly purchased goods, internal judgmental reference price is more likely to be used with the benefit of the consumer's experience of quality characteristics. Thus, rather than allow the consumer to rely solely on price information, marketers should supply other information, such as special features and benefits about the product offering, so as to engage the consumer in a valuation process and only use the price as one indicator of

the product quality. Such a strategy will enhance the plausibility of the listed price.

3. Heterogeneity in Consumers' Behaviour:

When consumers shop in different environments (i.e. supermarkets and convenience stores), marketers can supply consumers with information about the general price level in the product category, thus adjusting consumers' expectations for a specific store. For example, indication of the costs associated with running a convenience store (i.e. store opening hours, service level, and special location) would alert consumers to consider the relative high cost of operating the specific store and thus increase their perception of a fair price.

Summary and Conclusions

Modelling reference price effects on consumers' choice is highly dependent on the specific conceptualisation chosen for this purpose. Thus, it is important to properly identify the conditions under which some concepts are more relevant then others. We propose taxonomy of reference prices and a classification mechanism based on the different cognitive processes involved in forming reference prices. This classification highlights the role of internal reference prices in general, and the role of judgmental processes in reference price formation and evaluation, in particular.

The judgmental process of reference price formation offers more insight into consumer choice evaluations as well as a deeper perspective into future consumer actions. Within this framework, reference price concepts that rely on judgments of quality and price limits enable us to establish invariant evaluations across shopping environments. Thus, in this context, (i.e. supermarkets and convenience stores), one should use quality and boundary judgments to avoid a sub-optimal modelling problem. The amount of cognitive effort imposed by these concepts is less than that imposed by the behavioural reference price concepts, because the evaluations are based on experience with the product and not on the retrieval from memory of price information nor on a conceptual estimation of prices from past purchases.

When considering other market variables that can have an effect on reference formation, such as macroeconomic variables, the role of external reference price increases in importance. When product characteristics are considered, a differential effect of internal and external reference prices is expected.

We provide seven research propositions that can serve as a direction for future research. Perhaps the most urgent areas of such research should involve the examination of the role of reference price in durables. Beyond

what was stated in Propositions (5) and (6), such an endeavour will enhance the general understanding of the importance of reference price in consumers' behaviour, in general and in pricing decisions, in particular. It should be noted, however, since most of the reference price concepts discussed in the literature, especially the empirical ones, used some type experienced-based mechanism they do not have much relevance to durables. In addition, most of these studies used scanner data as a source for the investigation that allows for multiple observations for each household. This can raise some concerns about the potential motive for selecting such types of reference price conceptualisations (i.e. mostly exponential smoothing updating mechanisms) as well as the generalisability of the findings to *not so* frequently purchased products (i.e. yogurt - sometimes several purchases a week vs. non-food items). Research that will look at the various aspects of durables as well as investigate our propositions will have a significant contribution to the pricing research area.

Other types of areas for further research include the comparison of different macroeconomic conditions. Again, this area has not been investigated in the context of reference price although its importance in the economic literature is quite substantive. This type of research can be done, especially with non-durables, in economies with heterogeneity in inflation and income. It can also include the use of scanner-data type sources, which are now more common in different countries. In the case of consumers' heterogeneity, some research has already been done. For example, Mazumdar and Papatla, (1996) investigated the use of external reference price by loyal consumers and the use of internal reference price by non-loyal consumers. The same authors use a latent segmentation scheme to investigate a dual reference-price-based formulation of both internal and external reference prices. The segmentation scheme was based on the weight, or composition, of the two types of reference prices in consumers' reference price (Mazumdar and Papatla 2000). The characteristics proposed in Propositions (1) and (2) are more general in nature and, therefore, require a different type of research setting. Again, the use of scanner data in these research studies limits the ability to draw generalizations about various shopping environments where consumers do their shopping in grocery stores and other outlets (i.e. open markets, small grocery stores) that are not part of the scanning database.

As stated earlier, the current research focuses only on reference price effects and is the first step in expanding the general understanding of the role of reference price in consumers' behaviour, in general and the suitability of the varied concepts of reference price to specific marketing situations. As such, it does not include any provisions for the importance of other marketing mix variables, except for general comments on considering the

effects of plausible and implausible external reference prices. Thus, further investigation can include the effect of other marketing mix factors. Though special display and featured advertisements are included in most scanner-data-based work and quality in several others (i.e. Lattin and Bucklin 1989), other product-related issues such as attribute perceptions or distribution issues can add to general understanding of consumer behaviour in the presence of reference price effects.

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