

An experimental study of brand signal quality of products in an asymmetric information environment

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Abstract

Previous research regarding the effectiveness of signalling via brand name has focused on when and how brand-building costs will be recovered in future profit. In contrast to such a seller-incentive perspective, this study examines how the buyer interprets the signal via brand name, the effectiveness of signalling via brand name in terms of buyer-value perspective, and how the buyer's reaction to the signal affects the seller's decision to adopt the signalling strategy. Signalling theory and concepts from consumer-based branding research are used to suggest how to evaluate the effectiveness of signalling via brand name in the context of the consumer market—a market in which information is asymmetric. Findings from online trading experiments, using the methodology of experimental economics, demonstrate that the function of brand fluctuates according to which market conditions prevail for brand and price, the extent of brand differentiation, and the magnitude of brand-building cost.

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1. Introduction

Asymmetric information problems are the result of opportunistic behaviour and, consequently, vested interests ensure that certain information is kept private [1]. It has been claimed that signalling can be a useful countermeasure to information asymmetry [2]. In the marketing discipline, the question of whether or not such variables as price, warranty, and brand name which can serve as signals has been investigated [3]. However, the findings of most of these studies have simply been explained using signalling theory, rather than being utilised to enhance the basis of the theory itself for the purposes of prediction. Furthermore, there has been

little research into the connection between signalling theory and the scant empirical data relating to the function of brand and pricing behaviour [4,5].

A brand name can convey information about unobservable quality when false claims might result in intolerable economic losses. That is, if sellers of low-quality products attempt to claim high quality for a product, brand-building costs and future profits would be forfeited when the true quality is revealed after purchasing. Thus, the buyer rationally infers that only a seller of high-quality products will adopt a signalling strategy. Accordingly, a branded product is probably of higher quality than an unbranded one, and the brand can therefore serve as an effective signal of unobserved quality [4]. In marketing discipline, such brand-building costs are a question of incentive or loss—that is, whether the costs are justified in the light of future profits [6]. However, findings regarding the utility of brand name as

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a signal from the single aspect of seller's incentive perspective, while neglecting the buyer's reaction to signalling, do not help in an understanding function of brand to the buyer when information is asymmetric. Specifically, little empirical evidence is available regarding the value of brand to the buyer when asymmetric information, rather than complete information, prevails. In addition, whereas the literature on price-perceived quality relationships is substantial, the empirical literature on price as a signal is sparse [5].

In this study, concepts from consumer-based branding research (differential effect) [7] and signalling theory [8] are used to propose a conceptual model to examine signalling via brand in a consumer market in which conditions of asymmetric information prevail. The investigation is supported by a series of propositions that set out when and how brand might be a signal of product quality, with particular attention being paid to the question of value for the buyer rather than incentive for the seller. Specifically, the research questions concern:

- (i) how the buyer interprets signal via brand and how effective that signalling is in terms of value for the buyer;
- (ii) how the buyer's reaction to brand as signal affects the seller's decision to adopt signalling strategy and on his or her pricing behaviour; and
- (iii) what function brand has for the buyer in conditions of asymmetric information.

The research methodology for the present study involved the designing of an online game (a simulated posted-offer market) to test the above questions. The approach was based on certain previous experimental games from the field of economics [9,10]. The designed posted-offer market resembled a 'lemon market' in that it typified the adverse selection situation that results from asymmetric information conditions [11]. In addition, it provided an incentive mechanism to the seller of high-quality products, who was given the opportunity of signalling (via brand name) and thus revealing the quality of the product at extra cost.

The study then discusses the theoretical implications of signal theory in the consumer market, the function of brand in conditions of both complete and incomplete information relative to the interests of both the seller and the buyer, and the implications of pricing behaviour when information is asymmetric. Finally, the limitations of the methodology are acknowledged, and suggestions for further research are offered.

2. Conceptual background and hypotheses

2.1. The differential effect of the value of brand for the buyer

Pricing strategies employed by all marketers consider how the product is priced relative to its value for buyers and that

of similar sellers [12]. Therefore, we adopt the notion of 'differential effect' [7] in this study to develop the measure of effectiveness of signalling via brand for the buyer. The notion of 'differential effect' means that customer-based equity involves a comparison of the consumer's reaction to the marketing mix for a brand with that customer's reaction to the same marketing mix for a fictitiously named or unnamed version of the product or service. Accordingly, the effectiveness of signalling via brand for the buyer is defined for the purposes of the present study as the difference between the expected gain and the actual gain when brand information is available and when it is not available—that is, the difference in gain for the buyer between buying a branded and an unbranded product.

First, it is argued that the quality of an unbranded product is less believable for the buyer and the differential benefit between buying a branded and an unbranded product is greater when the market is highly brand-differentiated. In this case, the effectiveness of signalling for the buyer is significant. This leads to two hypotheses being proposed regarding brand differentiation and the effectiveness of signalling for the buyer.

H₁: The higher brand differentiation there is in the market, the lower belief the buyer has in the quality of an unbranded product.

H₂: The lower the buyer's belief in the quality of an unbranded product, the more effective is brand as a signal for the buyer.

Secondly, although Kirmani and Rao [5] have stated that it is the size of signal cost that determines whether signalling is effective or not, they were still prepared to attribute some of the effectiveness to the size of the segment of quality-insensitive buyers in the market, at least so far as the impact of the buyer's reaction to the seller's signalling strategy is concerned. A relatively larger quality-insensitive segment is less attractive to the seller of low-quality products, and therefore the seller of high-quality goods can use signals that yield current profit. As for the quality-insensitive segment of the market, however, it is important to discover the factors that determine its size, so that researchers could test the hypothetical bases of signal theory from the buyer's perspective. The present study proposes that the segment's size depends on the extent of brand differentiation. Thus, it is argued that the lower the buyer's conviction regarding the quality of the unbranded product (when the market is highly brand-differentiated), the smaller the quality-insensitive segment. Therefore, the smaller the segment is, the more incentive the sellers of high-quality products have to adopt a signalling strategy—because they are more likely to profit from it. This leads to the following hypothesis being proposed:

H₃: The lower the buyer's belief in the quality of an unbranded product, the more effective is brand as a signal for the seller.

2.2. The profit incentive for the seller

For the seller, signalling is only effective if the gain from brand-building (offering branded products) outweighs any gain that might be obtained from not brand-building (offering unbranded products) [6]. If the brand-building costs incurred are likely to be recovered from future profit, the seller of high-quality products will tend to invest in a branded product market. In these circumstances, signalling is likely to be effective for the seller. Moreover, if the proportion of high-quality products in the unbranded product market is relatively small, the average gain (for the buyer) as a result of buying unbranded products will be lower—that is, the difference in the gains between buying branded and unbranded products is larger. In this case, the effectiveness of signalling for the buyer is again more effective. Continuing the line of the above argument, the impact of the size of signal cost on the effectiveness of the signal for the buyer can be summarised in the following hypotheses:

H₄: The lower the signalling cost, the more effective is brand as a signal for the seller.

H₅: The more effective brand is as a signal for the seller, the more effective is brand as a signal for the buyer.

As noted above, the present study defines the effectiveness of signalling for the buyer as the difference in gains between buying a branded product and buying an unbranded one. In addition, the study demonstrates how such a difference constitutes the effectiveness of brand as a signal for the buyer and seller respectively.

2.3. Pricing behaviour when brand serves as a signal of quality and asymmetric information prevails

The thought behind pricing behaviour is that if signalling via brand name is effective, mimetic pricing behaviour on the part of an opportunist is inhibited. As a result, the difference between prices of branded and unbranded products is significant. This leads to the measure of pricing behaviour in this study being defined as the distinctions among the prices of branded products posted by a seller of high-quality products, those of unbranded products posted by a seller of high-quality products, and those of unbranded products posted by a seller of low-quality products. On the basis of the assumptions of, and deductions from, signalling theory, this study proposes the following two hypotheses to explain pricing behaviour when brand signals product quality and information is asymmetric:

H₆: The lower the signalling cost, the more significant is the difference between the prices of branded products of high quality and unbranded products of high quality.

H₇: The higher the brand differentiation in the market, the more significant is the difference between the prices of

branded products of high quality and unbranded products of low quality.

3. Methodology

The methodology was designed with a view to certain experiments in economics [9,10]. An online simulated posted-offer ('take-it-or-leave-it') market model was designed to represent a 'lemon market', together with a signalling phenomenon via brand. This framework of online trading in asymmetric information conditions was then used to observe traders' behaviour. The underlying assumption is that the game players will choose to maximise benefit or minimise cost [13] rather than make a decision by preference.

3.1. Experimental design

Three kinds of market conditions were employed for testing. The first condition was posted brand and price—that is, a market in which the seller posts brand and price and the buyer must take it or leave it. The second condition was posted price only—that is, a market in which the seller posts only the price associated with a specific brand (with the brand information remaining unseen by the buyer). The third condition was a combination of the first two—that is, a market in which the seller has the option of posting price only or paying an extra fee to post brand and thus reveal product quality.

The second condition is typical of a market in which information is asymmetric, and the third contains an incentive mechanism for the seller of higher-quality products to reveal true information via brand, but at extra cost.

3.2. Manipulated variables

3.2.1. Brand differentiation

In experiments B1S1 and B1S2 (where B represents brand differentiation and S represents signal cost) the cost and value structure were associated with the Twinhead, Acer, and IBM brands of laptop computers, and it is notable that there was relatively more variation in brand value for the buyer and in cost for the seller. In contrast, in experiments B2S1 and B2S2, the cost and value structure were associated with the Compaq, IBM, and Toshiba brands of laptop computers, and there was less difference between brands in terms of value for the buyer and cost for the seller.

3.2.2. Signal cost

The experimental settings for exploring the difference in signal cost between BXS1 (higher) and BXS2 (lower) (where X indicates both 1 and 2) were designed to test the effect of the difference in signal cost on the effectiveness of brand as a signal. The four experimental settings are shown in Table 1.

Table 1
The experiments in terms of brand differentiation and signal cost

Brand differentiation (B) Signal cost (S)	High	Low
	(Twinhead, Acer, IBM)	(Compaq, IBM, Toshiba)
High	B1S1	B2S1
Low	B1S2	B2S2

3.3. Dependent variables

3.3.1. Effectiveness of signalling for the seller

The difference in surplus for the seller of high-quality products between adopting and not adopting brand was measured as a signal. The decision to adopt or not was apparent from the transaction success record, which showed that the seller had chosen to post price and brand at extra cost or to post price only at no extra cost (the third market condition).

3.3.2. Effectiveness of signalling for the buyer

The buyer's surplus in a transaction period was adopted as a construct for the actual gain. Therefore, the measure of the effectiveness of signalling for the buyer was the difference in surplus for branded and unbranded products, based on the transaction success record in the third market condition.

3.4. Intermediary variable

3.4.1. Buyer belief

The measure of the buyer's belief was taken as the difference in surplus for the buyer, based on the transaction success record for brand and price (the first market condition) and for price only (the second market condition).

3.5. Participants and procedures

The game players were 168 second-year marketing students in the business school of a large university in Western Australia during July and August 2001. The instructor divided the players into 24 groups of seven players each, three of whom were designated as sellers and four as buyers. A dedicated server and web site for trading activities had been set up and a computer terminal was assigned to each group for this purpose. To ensure that the rules were understood and able to be followed before initiating any trading activity, the instructor distributed instruction sheets relevant to the particular market condition in play, and took questions.

The trading occupied 24 sessions of approximately 50 min each. Each session was devoted to one of the four different experimental settings, two of which concerned brand differentiation (high, low), and two of which concerned signalling cost (high, low). In each session, all groups experienced the three kinds of market conditions (that is, posted brand and price, posted price only, and optional posted brand at extra

cost). For each condition, three or four transaction periods were allowed.

The study had two phases—a pilot phase and a main phase. The pilot test involved subjects participating in one session under each setting, for a total of four experimental settings, to test the feasibility of the game. Thereafter, the main phase of the study included five sessions under each setting to complete the series of experiments.

Each session of the game began with the instructor opening the first market condition on the web site. He then opened the first transaction period by inviting all the sellers in the groups to post their brand and price. This having been done, the instructor then opened the market to the buyers in the groups by inviting them to choose whether to buy the products on offer or to make no purchase. The instructor then closed the first transaction period and opened the second. Usually three or four periods were needed to reach equilibrium in the market before it was closed [10]. The instructor then opened the second market condition, with sellers posting price only, and a sequence exactly the same as for the first condition was repeated. However, once the instructor opened the market, the buyer saw only the prices and the number associated with the seller but no brand information. The instructor then opened the third market condition. In this case, the sellers had two posting options (to post price and brand at extra cost, or to post price only at no extra cost). The procedure was the same as for the preceding two conditions. However, the buyer might thus be faced with a choice of two offers: price and brand, or price only. The buyer could try to maximise earnings only on the basis of the available information.

4. Results

4.1. The effectiveness of signalling

First, the buyers' surplus was extracted from the data and its mean was calculated for the first two market conditions—classified as [A] and [B] in Table 2. The transactions in the third condition were sub-classified as [C_{b1}] and [C_{b2}], and as [C_{s1}] and [C_{s2}], which, for the buyer, represented the mean surplus between buying branded and unbranded products and, for the seller, represented the mean surplus between offering branded and unbranded products.

Table 2
Mean and mean difference in buyer and seller surplus

	Brand differentiation			
	High		Low	
	Signal cost			
	High B1S1	Low B1S2	High B2S1	Low B2S2
<i>Mean of buyer surplus</i>	[1]	[2]	[3]	[4]
[A] Brand and price market condition	0.41	0.55	0.43	0.52
[B] Price-only market condition	-0.71	-1.23	0.03	0.15
[C] Optional posted brand at Extra cost or posted price only market condition				
<i>Mean of buyer surplus</i>				
[C _{b1}] Purchasing branded product	0.31	0.35	0.23	0.27
[C _{b2}] Purchasing unbranded product	-0.54	-2.28	-0.01	-0.18
<i>Mean of seller surplus</i>				
[C _{s1}] Offering branded product	0.69	0.65	0.77	0.73
[C _{s2}] Offering unbranded product	0.62	0.00	0.80	0.00
<i>Dependent variable</i>				
[A] – [B] Buyer belief	1.12	1.78	0.40	0.37
[C _{b1}] – [C _{b2}] Effectiveness of signalling for buyer	0.85	2.63	0.24	0.45
[C _{s1}] – [C _{s2}] Effectiveness of signalling for seller	0.07	0.65	-0.03	0.73
Hypothesis for test	Dependent variable	Independent variable	Post hoc test (Scheffe)	Result of test
H ₁	[A] – [B]	Brand differentiation	[1] + [2] > [3] + [4]	Support
H ₂	[C _{b1}] – [C _{b2}]	Buyer belief	[1] + [2] > [3] + [4]	Support
H ₃	[C _{s1}] – [C _{s2}]	Buyer belief	[1] + [2] > [3] + [4]	Reject
H ₄	[C _{s1}] – [C _{s2}]	Signal cost	[2] + [4] > [1] + [3]	Support
H ₅	[C _{b1}] – [C _{b2}]	Effectiveness of signalling for seller	[2] + [4] > [1] + [3]	Support

Secondly, to determine the mean difference in surplus, an analysis of variance (ANOVA) was performed on the buyer's belief and on the effectiveness of signalling for the buyer and the seller. The results are shown as [A] – [B], [C_{b1}] – [C_{b2}], and [C_{s1}] – [C_{s2}], respectively.

Thirdly, post hoc tests (Scheffe) were performed on each attribute level of the experimental groups to examine Hypotheses, the results of which are shown at the bottom of Table 2.

It will be recalled that Hypothesis 1 was proposed in the following form:

H₁: The higher brand differentiation in the market, the lower belief the buyer has in the quality of an unbranded product.

That is, the more highly the market differentiates brand, the more the buyer perceives a loss when he or she receives erroneous product quality relative to price. In such a situation, the buyer's belief in the quality of a posting

with no brand information is lower. As predicted, the results for this hypothesis show that the more differentiated the market is (that is, B1S1 and B1S2), the greater the buyer's gains achieved when brand information is available than not ($M = 1.12$ and 1.78 vs. $M = 0.40$ and 0.37), $F = 32.808$, $p < 0.01$, see row [A] – [B], buyer belief, in Table 2. Also see Hypothesis H₁[1] + [2] > [3] + [4], as shown in the bottom row of Table 2.

It will be recalled that Hypothesis 2 was proposed in the following form:

H₂: The lower the buyer's belief in the quality of an unbranded product, the more effective is brand as a signal for the buyer.

That is, the less belief the buyer has in a price-only posting, the more effective signalling is for that buyer. As shown in the row in Table 2 depicting [C_{b1}] – [C_{b2}], effectiveness of signalling for buyer, the lower the belief the buyer has in the market (that is, B1S1 and B1S2), the more effective

Table 3
The mean and mean difference in prices of branded and unbranded products

			<i>Brand differentiation</i>			
			High		Low	
			<i>Signal cost</i>			
			High	Low	High	Low
			B1S1	B1S2	B2S1	B2S2
<i>The mean price</i>			[1]	[2]	[3]	[4]
[A] Branded product of high quality			7.94	7.72	7.86	7.74
[B] Unbranded product of high quality			7.17	6.10	7.70	6.83
[C] Unbranded product of low quality			6.62	6.90	7.75	7.67
<i>Dependent variables</i>						
[A] – [B] Branded and unbranded products of high quality			0.77	1.62	0.16	0.91
[A] – [C] Branded products of high quality and unbranded products of low quality			1.32	0.82	0.11	0.08
Hypothesis for test	Dependent variable	Manipulated variable	Post hoc test (Scheffe)		Result of test	
H ₆	[A] – [B]	Signal cost	[2] + [4] > [1] + [3]		Support	
H ₇	[A] – [C]	Brand differentiation	[1] + [2] > [3] + [4]		Support	

signalling is for that buyer compared with instances in which belief in the market is greater (that is, B2S1 and B2S2), ($M = 0.85$ and 2.63 vs. $M = 0.24$ and 0.45), $F = 13.322$, $p < 0.01$. Also see Hypothesis H₂[1] + [2] > [3] + [4], as shown in the bottom row of Table 2.

It will be recalled that Hypothesis 3 was proposed in the following form:

H₃: The lower the buyer's belief in the quality of an unbranded product, the more effective is brand as a signal for the seller.

That is, the less belief the buyer has in a price-only posting, the more effective signalling is for the seller. It is acknowledged that testing this hypothesis is difficult. The difference in the effectiveness of signalling for the seller in lower buyer-belief markets (that is, B1S1 and B1S2) is not significant compared with the high buyer belief markets (that is, B2S1 and B2S2), ($M = 0.07$ and 0.65 vs. $M = -0.03$ and 0.73), $F = 30.731$, $p < 0.01$ (see row [C_{s1}] – [C_{s2}], effectiveness of signalling for the seller, in Table 2).

It will be recalled that Hypothesis 4 was proposed in the following form:

H₄: The lower the signalling cost, the more effective is brand as a signal for the seller.

That is, the lower the signal cost, the more incentive the seller has to reveal brand at extra cost. As predicted, the result here shows that the less signal cost incurred (that is, B1S2 and B2S2), the more effective is signalling ($M = 0.65$ and 0.73 vs. $M = 0.07$ and -0.03), $F = 30.731$, $p < 0.01$ (see

the row in Table 2 depicting [C_{s1}] – [C_{s2}], effectiveness of signalling for seller). Also see Hypothesis H₄[2] + [4] > [1] + [3], as shown in the bottom row of Table 2.

It will be recalled that Hypothesis 5 was proposed in the following form:

H₅: The more effective brand is as a signal for the seller, the more effective is brand as a signal for the buyer.

That is, B1S2 and B2S2 are markets with a high incentive for the seller. They make signalling more effective for the buyer than B1S1 and B2S1, which are markets with low incentive for the seller ($M = 2.63$ and 0.45 vs. $M = 0.85$ and 0.24), $F = 57.837$, $p < 0.01$ (see [C_{b1}] – [C_{b2}], the effectiveness of signalling for buyer in Table 2. Also see Hypothesis H₅[2] + [4] > [1] + [3], as shown in the bottom row of Table 2.

4.2. Pricing behaviour

First, the mean prices for both branded and unbranded products from sellers of high-quality products, as well as those for unbranded products from sellers of low-quality products, are shown as [A], [B], and [C] in Table 3. Secondly, the mean difference in the prices was calculated by performing ANOVA on the data for branded and unbranded products offered by sellers of high-quality products, and for branded product offerings by sellers of high-quality products and unbranded product offerings by sellers of low-quality products. These are shown as [A] – [B] and [A] – [C] in Table 3. Thirdly, post hoc tests (Scheffe) were performed on each attribute level of the experimental groups to

examine Hypotheses H₆ and H₇, as shown at the bottom of Table 3.

It will be recalled that Hypothesis 6 was proposed in the following form:

H₆: The lower the signalling cost, the more significant is the difference between the prices of branded products of high quality and unbranded products of high quality.

That is, Hypothesis H₆ states that the lower the signalling cost the more the prices for branded and unbranded products posted by the seller of high-quality products differ. As predicted, the result in the row depicting [A] – [B], high-quality branded and unbranded products, shows that the lower the signal cost incurred by the seller of high-quality products (that is, B1S1 and B2S1), the more the prices for high-quality products with and without signalling differ ($M=1.62$ and 0.91 vs. $M = 0.77$ and 0.16), $F = 10.394$, $p < 0.05$ (also see Hypothesis H₆ [2] + [4] > [1] + [3], as shown in the bottom row of Table 3).

It will be recalled that Hypothesis 7 was proposed in the following form:

H₇: The higher the brand differentiation in the market, the more significant is the difference between the prices of branded products of high quality and unbranded products of low quality.

That is, Hypothesis H₇ states that the more the brand is differentiated, the more the prices for high-quality branded and low-quality unbranded products differ. The result in the row depicting [A] – [C], high-quality branded and low-quality unbranded products, shows that the more brand is differentiated (B1S1 and B1S2), the more the prices for high-quality products with signalling and for low-quality products with false signalling¹ differ, compared with the less brand differentiated (B2S1 and B2S2) ($M = 1.32$ and 0.82 vs. $M=0.11$ and 0.08), $F = 10.394$, $p < 0.05$ (see also Hypothesis H₇ [1] + [2] > [3] + [4], as shown in the bottom row of Table 3).

5. Conclusions and implications

5.1. The experimental findings

First, there are two forces that drive the effectiveness of signalling via brand and the pricing behaviour of sellers in asymmetric information conditions. The first is the degree of brand differentiation in the market. This factor results from combining the strategic interaction among sellers concerning product differentiation and the effect of the differential value

of brand for the buyer. The second factor is governed by the seller alone—namely, brand-building cost (signal cost).

Secondly, in a highly product-differentiated market, the buyer's interpretation of brand value lowers his or her conviction about the quality of unbranded products. That is, an enlargement of the segment of quality-sensitive buyers in the market means that buyers are willing to pay higher prices for branded products. Consequently, opportunistic behaviour in the form of false signalling from sellers of low-quality products at high prices is significantly inhibited, as Hypothesis H₇ predicted. Even, the effect of the buyers' interpretation of the value of brand on the sellers' behaviour of false signalling is significant. However, the other kind of opportunistic behaviour (in the form of offering unbranded products by sellers of high-quality products without brand building at high price) is not significant, as Hypothesis H₃ rejected. The explanation in this study is that the effect of the size of signal cost on impeding such opportunistic behaviour is more significant than the effect of the buyers' interpretation of the value of the brand.

Thirdly, if future profit can compensate for brand-building costs, the seller of high-quality products tends to adopt signalling and offers branded products at higher prices, thus gaining competitive advantage through brand differentiation. Therefore, opportunistic behaviour (in the form of offering unbranded products from sellers of high-quality products without brand-building at high prices) is significantly inhibited, as Hypothesis H₆ predicted.

5.2. Theoretical implications

5.2.1. Signalling theory

Research to date has shown that signal cost influences whether a seller of high-quality products adopts a signalling strategy. However, little research has addressed how buyers interpret such a signal in a consumer market from the perspective of behavioural outcome rather than the psychological process [14]. The present study uses buyer's value to measure signal effectiveness. The view of the present study is that, except for the size of signal cost, the buyer's interpretation of brand value and his or her reaction to brand signal both play an important part in the seller's decision to adopt signalling. To conclude this discussion of the effectiveness of signalling for both buyer and seller jointly, it is suggested that, while reaching signalling equilibrium via the seller's incentive is one way of judging when signalling is effective, measuring the gain in value for the buyer is another way of judging how effective the signalling is.

Secondly, the results from the present signalling model of the consumer market demonstrate that such signalling involves three related behavioural factors: (i) the buyer's reaction to the seller's manipulation of brand and price; (ii) seller-to-seller behaviour appropriate to a brand differentiated market; and (iii) the buyer's interpretation of a branded product in a brand-differentiated market. Accordingly, the implications of signalling strategy for the seller's survival

¹ 'False Signalling' is that the sellers of low quality products offer unbranded products at high price.

in the consumer market are that the seller must consider: (i) how to reduce brand-building cost; (ii) how to differentiate a product via brand; and (iii) how to manipulate the information of brand associated with price intended to reach the buyer.

5.2.2. Consumer-based branding

The potential difference in gain to be obtained from buying branded products and unbranded products is a measure of brand value for the buyer. Applying signalling theory to the consumer market, the present study finds that the function of brand fluctuates according to: (i) prevailing market conditions; (ii) the differences that brand differentiation creates; and (iii) brand-building costs. For the buyer, the function of brand in complete information conditions is to act as a quality indicator and, if information is incomplete, to reduce search cost, psychological risk, and perceived risk—all of which are factors that potentially reduce the buyer's expected value. As for the seller, the function of brand in complete information conditions is to facilitate a range of activities, such as identification and differentiation [15], whereas, in incomplete information conditions, these activities enforce the utility of marketing activities that brand facilitates. Even in incomplete information conditions, when the seller of high-quality products cannot fully exploit the advantage [16], a signalling strategy at least allows such a seller to retain the utility the brand provides, as long as brand differentiation and building cost remain effective.

Williamson [1,17] has suggested that transaction costs should include both the direct cost and the possible opportunistic cost. Behind the transaction cost, the brand as a signal conveys information from seller to buyer and the ability of brand to signal unobservable quality is based on the potential loss of prior brand equity—related investments in reputation [4]. Compared with other studies of consumer-based brand equity research, the present study can be said to be an empirical undertaking, based on transaction cost and financial measurement. It explores the function of brand and brand value for the buyer in asymmetric information conditions, which is in contrast to research based on psychology and perception. These considerations give reason to suggest that, while the market can serve as an information-disseminating mechanism [5], brand can be seen as a transaction cost-reducing mechanism.

5.2.3. Pricing behaviour

Using the two dichotomies of (i) brand/no-brand signalling, and (ii) the product being of a high/low price, the simple 2×2 matrix of Fig. 1 can be constructed. This allows the identification of four corporate pricing behaviours. These behaviours and their implications are discussed below.

The present experimental results for pricing behaviour show that, in the more effective signalling market, the seller of high-quality products tends to take advantage of both

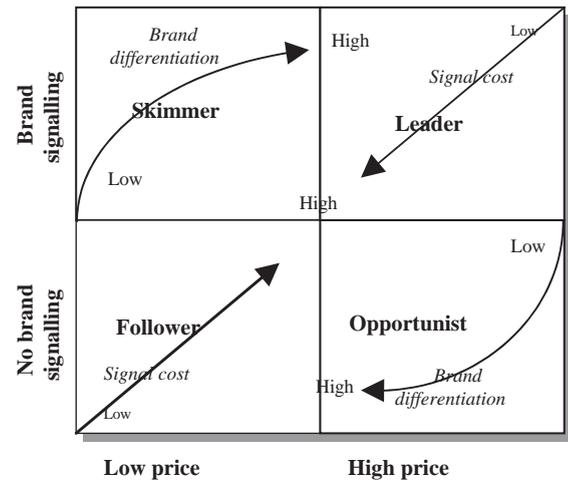


Fig. 1. Pricing behaviour under signalling phenomena.

lower brand-building costs and higher brand-differentiation to raise prices and enforce the competitive advantage of differentiation, thus assuming the role of 'Leader' (see Fig. 1). That is, the 'Leader' exploits that lower costs and higher price to distinguish itself from the 'Follower', a seller of high-quality products who does not indulge in brand-building. Such a behaviour uses brand to create a basic level of differentiation that prevents the product from becoming a commodity, in a manner analogous to brand-facilitating premium pricing [15]. In contrast, in markets that are less brand-differentiated, the seller of high-quality products either lowers the price and increases the volume of goods to enlarge market share or tries to eliminate the false signalling sellers, thus assuming the role of 'Skimmer' (see Fig. 1). The prevailing mimicry that occurred in the experiments was such that the price posted by the seller of low-quality products in incomplete information conditions was exactly the same or a little below that posted by the seller of high-quality products in complete information conditions. This mimetic behaviour of adding 'noise' is an attempt by the seller of low-quality products to jumble high-quality postings and low-quality postings and thus dupe the unwise or incautious buyer. That is, the seller of low-quality products assumes the role of 'Opportunist' (as shown in Fig. 1). Nevertheless, a market in which the brand is more highly differentiated provides the seller of high-quality products with an incentive to use brand signal to remove the noise and regain the utility of the marketing activities that brand facilitates.

Even in the real world, there is abundant evidence of bounded rationality in pricing behaviour, which indicates that sellers sometimes use price as a tool associated with brand to enlarge market share or to destroy competition [18]. However, the repetitive game type of the posted-offered market could be designed to take such

strategic action into account in depicting the phenomenon of pricing competition—that is, if the function of the signal is to act as a strategic tool by the seller to send a message to competitors rather than as a simple mechanism to inform the buyer about quality.

6. Limitations and further research

Firstly, experimental approaches to examining marketplace phenomena are often criticised for lacking external validity [6]. The present experimental results are similarly susceptible to the criticism that the paucity of the settings makes for foreseeable outcomes or that the outcomes are a result of artificially strong manipulation.

Secondly, throughout the present experiments, the study considered only one category of product—laptop computers—and it might, therefore, be difficult to generalise from these results. The nature of the product might influence if the signalling is effective. For example, signalling is most useful for products in which quality is unknown before purchase, but unambiguous after purchase [5].

Thirdly, there is certainly scope for further research of signalling theory into the links between the buyer's perceptions and behaviour.

Fourthly, the present study was not able to establish signalling equilibrium in game-theory terms [19]. However, the study has at least provided: (i) a platform for further research into signalling theory from the viewpoint of economics and into the function of brand from the viewpoint of marketing; and (ii) a dialogue between theoretical prediction and empirical outcomes.

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