



Advertising, quality, and willingness-to-pay: Experimental examination of signaling theory

Hsiao-Chien Tsui*

Department of Economics, National Chung Cheng University, Chia-Yi 621, Taiwan

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ABSTRACT

According to the quality signaling theory, firms are motivated to invest more advertising in high-quality products. This paper conducts an experiment through a closed-ended double-bounded dichotomous choice of the contingent valuation method to measure consumer willingness-to-pay for a fictitious cell phone market of varying quality before and after advertising. The results show that advertising effectively influences consumer awareness of perceived quality and enhance their WTP. The results also suggest that even though the high- and low-quality products differ in the investment of advertising, the effect of advertising on the increase in consumer WTP for low-quality products as well as for high-quality products.

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1. Introduction

Numerous studies have suggested that firms are motivated to influence consumer perceived value by advertising because of the asymmetric information between seller and buyer. Therefore, advertising can enhance consumer *perceived quality* and alter their willingness-to-pay (WTP), creating a positive relationship between perceived quality and WTP (Kirmani & Rao, 2000; Kirmani & Wright, 1989; Zeithaml, 1988).¹ Perceived quality is the overall subjective judgment of quality relative to the expectation of quality. These expectations are based on personal experiences, in addition to various other sources including brand reputation, price, and advertising (Boulding & Kirmani, 1993; Dodds, Monroe, & Grevval, 1991; Zeithaml, 1988).

Theoretically, researchers indicate that firms with high *quality* are willing to invest more into advertising for greater returns over time. They emphasize advertising as the signal of firms to convey quality (Fluet & Garella, 2002; Nelson, 1974),

* Tel.: +886 5 2720411x34109; fax: +886 5 2720816.

E-mail address: ecdht@ccu.edu.tw

¹ "Advertising" derives from Latin (*advertere*) and it means to draw others' attention or influence the people's intention. Basically, the advertising effect can be divided into the communication effect and the sales effect. The communication effect means the level at which the advertising is accepted by the consumers and influences the consumers' attitude and behavior; sales effect is measured by the increase in the actual sales after the advertising. Based on this definition, the advertising effect in this paper refers to the former.

also known as quality signaling theory.² In contrast to perceived quality, the *quality* referred to here is *objective quality*. Objective quality is the aggregate performance of all vector product attributes (Kopalle & Lehmann, 1995). For example, the objective quality of a personal computer includes processing speed, hard disk capacity, reliability, battery, graphics, and WebCam. In this paper, *objective quality* and *quality* are synonymous.³

This paper addresses whether advertising of high-quality and low-quality product influence consumer WTP differently when it takes the advertising effect of quality signaling into account. In other words, when firms invest in different types of advertising for high- and low-quality products, does consumer WTP for high- and low-quality products change in the same or not? Specifically, firms are motivated to invest more advertising in high-quality products. When advertising influences consumer perception of product quality, the advertising affect should differ according to varying product qualities; the change in consumer WTP for products after advertising differs according to varying product quality. Thus, besides probing the influence of advertising on consumer WTP, this paper also considers the different advertising effects of product quality.

Unlike related studies which measure the relationship between advertising and WTP by regression analysis or structural equation modeling, this paper is based on the closed-ended double-bounded dichotomous choice of the contingent valuation method (CV method). The CV method is a simple, flexible nonmarket valuation method based on a questionnaire that offers the respondents an opportunity to make an economic decision on a good, which no market exists. That is, the valuation is contingent upon the simulated market presented to the respondents. Nowadays the method is widely used to evaluate consumer WTP for public goods such as environmental goods or natural resources. However, some literatures have examined private goods using this approach. The concept of the CV method, closed-ended double-bounded dichotomous choice especially, will be explained in the next section.

In order to compare the advertising effect on WTP, this paper creates targeted products in a hypothetical market. The data is collected through internet questionnaires. Since most online users are familiar with electronic products, this paper treats camera cell phones as the targeted products. The cell phones in the experiment are the fictitious product not yet available in the Taiwan market. The cell phone is further divided into two segments of high and low-quality to compare their advertising effects.⁴ For time and cost consideration, the experiment deals with print advertising. Except for pricing, information such as weight, size, volume, basic functions, extra functions, and even the checking system of the targeted products are introduced in the advertising. To highlight the advertising difference of high and low-quality products, this experiment provides additional content describing the advertising of high-quality cell phones. The questionnaire for the experiment design and data involves a pretest and survey. The ages of respondents in the pretest ranged from 18 to 35 years old, with 40 questionnaires. The final survey was based on an experiment questionnaire, yielding 500 valid questionnaires.

The paper is organized as follows. Section 2 presents the closed-ended double-bounded dichotomous choice of the CV method. Section 3 explains the questionnaire design, data collection, and primary statistical results. Estimated results are presented in Section 4. Besides measuring the change in consumer WTP for high and low-quality products before and after advertising, this paper further investigates the marginal effect of income on WTP and the influence of element on WTP. In the conclusion, besides generalizing the research finding and contribution, this paper proposes suggestions with regard to the analytical approach.

2. Research method

This paper gauges the change in the consumers' WTP before and after advertising using the CV method to construct a contingent or fictitious market. The questionnaire survey is based on price inquiry to capture respondents' WTP and afterward estimates the subjective price of WTP or willingness-to-accept.⁵ The CV method includes four types of price inquiry: open-ended format, sequential bidding format, payment card format, and closed-ended format.⁶ Hoehn and Randall (1987) suggested that the closed-ended price inquiry is similar to consumption behavior and could thus avoid the strategic bias.

The closed-ended format is also termed a dichotomous choice and is further divided into a single bounded dichotomous choice and a double-bounded dichotomous choice. Previous studies indicate that statistical efficiency of the parameter esti-

² Basically, there is positive relationship between advertising and quality. However, some studies suggest there is a reverse "U" relationship between advertising expense and perception quality. Extremely high advertising expense will reduce perception quality (Kirmani, 1990; Kirmani, 1997). Moreover, Schmalensee (1978) suggests in the experience goods market with the advertising effect of different periods, the advertising expense of high-quality products is not necessarily more than low-quality products. Zhao (2000) demonstrates with incomplete information of the product quality, firms which produce high-quality products are motivated to increase the price and reduce advertising expense. Thus, he suggests the products with high advertising expense are not necessarily high-quality.

³ Besides advertising, the signals which convey quality also include price, brand and assurance. These allow the consumers to evaluate or have purchase decision without being familiar with the characteristics of the products. The related literatures are, for example, Azar (2011), Caves and Greene (1996), Grossman (1979), Milgrom and Roberts (1986), Rao, Qu, and Ruckert (1999), Wolinsky (1983).

⁴ The targeted product of camera cell phone is currently not on the market of Taiwan. For the concern of the consumers' prejudice toward the brand and nationality, the experiment eliminates these two factors in the questionnaire.

⁵ The CV method is also called "contingent market evaluation." For the introduction and reorganization of the theoretical base and empirical study related to the CV method, please find Cummings, Brookshire, and Schulze (1986).

⁶ "Open-ended format" means to directly inquire into the targets' WTP or price accepted without any hints in advance. The "gradual auction" is similar to auction. The interviewer suggests a specific price under certain conditions and inquires into the targets' willingness to accept to continue the adjustment until the targets accept the prices. A "payment card" means the interviewer sets up different prices according to the primary data and selects the most proper WTP according to the targets.

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