

Using Hedonic Price Analysis In Food Labeling Class Actions

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In recent years, there has been an increase in the number of consumer class actions brought against manufacturers of retail food products, particularly with respect to labels and advertising describing products as “all-natural” or otherwise beneficial to health. Plaintiffs in these matters allege false advertising and typically assert that class members either would not have purchased the products absent the false claims or would have paid a lower price for them.



Sushrut Jain

Increasingly, courts have asked plaintiffs at the class certification stage to provide more information regarding the method they propose to use for the measurement of damages on a classwide basis. The demonstration of the existence of a classwide method also has implications for the important issue of predominance. For a court to certify a class it must determine that “questions of law or fact common to class members predominate over any questions affecting only individual members.”^[1] If there is no common method to calculate damages across class members, then the case for predominance is significantly weakened.

In its landmark ruling in *Comcast*, an antitrust matter, the Supreme Court held that plaintiffs must undertake a rigorous analysis at the class-certification stage and further that they, “must be able to show that their damages stemmed from the defendant’s actions that created the legal liability.”^[2] There has been similar movement by some district courts in false labeling cases. For example, in the *Pom Wonderful* class action, the District Court ruled that simply showing that the product in question has a higher price than some comparable products is not enough as it does not establish that the price premium was attributable to the alleged misrepresentations.^[3]

In response to such rulings, plaintiffs have begun to propose — in an increasing number of food labeling class actions — an econometric technique known as hedonic price analysis. Plaintiffs’ damages experts claim they can use the method to determine the existence and amount of the “price premium” resulting from the specific labeling claims at issue. The assumption behind the proposed use of this method is that in the absence of the false labeling, the price of the product would have been lower by an amount equal to the value of the falsely advertised attribute.^[4] Hedonic price regression has been put forth as the method to extract the values of individual product attributes using data on price, quantity, product attributes and other economic factors that may influence price.

In order to determine whether the application of this method to false advertising damages in retail food

product markets is appropriate, it is important to understand the economic theory behind hedonic price analysis.

What is Hedonic Price Analysis?

Hedonic price analysis is based on the idea that a consumer good is made up of multiple underlying attributes each affecting the consumer's utility separately. Variation in the amount of each attribute may result in variation in the consumer's utility and, under certain circumstances, in the prices charged for the good. The earliest work studying the impact of quality characteristics on prices was likely Waugh's 1928 paper on the prices of vegetables.[5] In 1966, Lancaster was the first to explicitly define consumer utility as a function of the characteristics or attributes of goods.[6] Building on Lancaster's idea, Rosen (1974) wrote the seminal paper on hedonic price analysis, formalizing the idea of observing differences in market prices to infer consumers' valuation of the underlying characteristics of the products.[7]

Consider a market for a product that has a few attributes, such as milk that may be pasteurized or unpasteurized, chocolate or regular, fat-free, reduced-fat, whole, or with some other percentage of fat, lactose-free or not, organic or not, from hormone-free cows or not, and so on. In such a market, if prices are set competitively, the difference between the prices of two otherwise similar types of milk sold in the same geographical market — one skim and the other reduced-fat — may be an indicator of the market value of the additional milkfat attribute.[8] A hedonic analysis involves the specification of a regression with price as a function of several variables including variables accounting for the presence or absence of the various product attributes.

Its simplicity notwithstanding, for the application of hedonic price analysis to provide meaningful results, certain conditions must hold true in that market, as described by Rosen (1974) and in the subsequent literature. The most important condition necessary for hedonic price analysis to be applicable is the existence of a competitive equilibrium in which price equals marginal value to the consumer, which in turn equals marginal cost to the producer.[9] In such a market, firms do not have the power to set prices, which are determined, instead, by an equilibrium between demand and supply for the good. In contrast, in a market where firms have the ability to set their own prices, the competitive condition needed for a hedonic price analysis to be reliable does not hold. The intuition behind this condition is that in a market where firms have enough market power to set prices instead of being price takers, the price of a product may reflect factors other than the cost of production and consumers' valuations of attributes. Simply put, a producer with some price-setting power is not restricted to setting prices at the competitive level where price equals the marginal cost. In such a market, changes in features may not bear a consistent relationship to changes in prices.

While a firm with monopoly power can certainly set prices above marginal cost, the more common instances of price-setting power occur in markets where firms sell differentiated products that are not perfect substitutes for each other — a market structure known as monopolistic competition.[10] Examples of such markets include a wide variety of consumer goods that are differentiated by specific features, which may be highlighted through branding, advertising, packaging and other means that tend to result in each producer selling — or being perceived by at least a certain segment of consumers as selling — a unique product.[11]

The problems with applying hedonic analysis to a market characterized by firms with price-setting power are readily apparent. For example, some firms in a monopolistic competition setting may price an entire product line at the same level despite significant differences in underlying attributes (a strategy known

as “line pricing”). For instance, a firm that sells different types of packaged soup might choose to sell its entire product line for the same price, regardless of whether a specific soup has noodles or doesn’t, has meat or doesn’t, has milk or doesn’t, and so on. In the Snapple decision, the court noted that Snapple’s practice of line pricing its products regardless of whether the product had an “All Natural” label would make the plaintiffs’ expert’s proposed assessment of inherent premium value of the All Natural claim infeasible.[12] Moreover, a firm with some pricing power might be able to remove the claim at issue in a litigation and continue to offer the product at the same price as before, perhaps at the cost of a reduction in market share.[13] A hedonic analysis would not generate a reliable measure of a “price premium” for a particular feature in such a setting.

The majority of the literature since Rosen has applied hedonic price analysis to the markets for housing and durable goods such as automobiles or computers[14] — products with attributes for which the direction of consumer preferences is, for the most part, predictable.[15] For example, consumers are expected to value positively more bedrooms or greater square footage.

In the case of nondurable goods, researchers have applied hedonic analysis in only a few instances. Chang et al.’s 2010 study of eggs and Huang et al.’s 2007 hedonic analysis of the price of fresh tomatoes to examine the value of an “organic” label are examples.[16] For these types of nondurables, the product in question generally has commodity characteristics with a few identifiable, key attributes. For example, in the case of milk, the other attributes (besides production method, which includes pasteurization, organic, hormone-free, etc.) include the flavoring (unflavored, chocolate, other), fat percentage, vitamin enrichment and even packaging (glass bottle or cardboard carton). For most of these attributes such as production method, or vitamin enrichment, consumer preferences are generally predictable: all else being equal consumers can be expected to value hormone-free production positively and put a premium on added vitamins.

On the other hand, retail food products that are highly differentiated — such as the example described above, packaged soup — can potentially have a large number of idiosyncratic characteristics for which the direction of consumer preference is unclear. A soup may have rice or wheat, be canned or frozen, be made using canola oil or sunflower oil, and the direction of consumer preference for these attributes is not obvious. Moreover, unlike agricultural products, two cans of soup sold by different companies might have more differences between them than similarities. It may not even be clear which products should be considered as potential substitutes. For example, should one consider frozen and canned soup to be the same product with different features? Are two cans of soup — even the same soup, say chicken noodle — sold by two different manufacturers comparable despite being made up of a completely different set of ingredients and using widely different recipes?

A fundamental difference between commodities that exhibit attributes for which the differentiation is not unique to the seller (e.g., milk)[17] and differentiated retail products such as packaged soup is branding. Valuable brands confer price-setting power on producers and, in such markets, price may not be simply a function of easily identified and measured product attributes.

Moreover, the problem may not be solvable by simply including brand as an explanatory variable in the price regression. In the case of many differentiated products, some features are idiosyncratic to — or at least highly correlated with — certain brands. For instance, in the case of potato chips, the feature of perfect uniformity in shape and size is strongly associated with the Pringle brand. A regression analysis attempting to place a value on the uniformity feature in potato chips will find a high degree of comovement between the Pringle brand and the feature, and the hedonic price regression could be unreliable due to a problem known as multicollinearity.[18]

There are several other potential problems with the application of hedonic price analysis more generally, including potential misspecification of regression variables and the choice of functional form. For instance, if the expert were to omit an attribute that is important to consumers, the regression results could be unreliable and overestimate the value of the attribute at issue if the omitted attribute is correlated with the feature at issue. There is also little theoretical guidance as to the choice of functional form — the relationship between price and attributes might be linear, exponential, log-linear or take some other functional form — for the regression.[19] These other issues may lead to additional problems with interpreting the results of a hedonic price regression in the context of a damages analysis for a false label.

As the introduction of hedonic price analysis becomes more prevalent in false labeling cases, courts will have to assess the applicability of the method in each case based on whether the product market meets the conditions that are necessary for the method to be reliable. If the product at issue is a highly differentiated, branded nondurable good, the economic conditions required for a valid application of hedonic price theory may not hold.

—By Sushrut Jain, Edgeworth Economics LLC

Sushrut Jain is a principal consultant in Edgeworth Economics' Pasadena office.

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[1] Federal Rules of Civil Procedure, Rule 23 (b).

[2] *Leyva v. Medline Indus., Inc.*, 716 F.3d 510, 514 (9th Cir. 2013).

[3] *In re: POM Wonderful LLC Marketing and Sales Practices Litig*, 2014 U.S. Dist. LEXIS 40415 (C.D. Cal. Mar. 25, 2014)

[4] The assumption is that an equilibrium price is determined by market transactions at the retail level.

[5] Waugh, F. V. “Quality Factors Influencing Vegetable Prices.” *J. Farm Econ.* 19(1928):185–196.

[6] Lancaster, K. “A New Approach to Consumer Theory.” *J. Polit. Econ.* 74 (1966):132–157.

[7] Rosen, S. “Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition.” *J. Polit. Econ.* 82 (1974):34–55.

[8] See Chang, J, J. Lusk, F. Norwood, “The Price of Happy Hens: A Hedonic Analysis of Retail Egg Prices,” *Journal of Agricultural and Resource Economics*, 35(3):406–423, 2010. Though the authors analyze egg prices, there are some common implications for commoditized food products such as milk.

[9] Anstine, Jeffrey, “Organic and All-Natural: Do Consumers Know the Difference?” *Journal of Applied Economics and Policy*, 26 (1), 2007, p. 17.

[10] Tirole, John, “Product Differentiation.” *The Theory of Industrial Organization*. Cambridge, MA: The

MIT Press, 1997. 277-95.

[11] Markets for non-durable consumer goods – soups, restaurant meals, apparel – offer several examples of markets with monopolistic competition, product differentiation, and producers with price-setting power.

[12] *Weiner v. Snapple Bev. Corp.*, No. 07 Civ. 8742 (DLC), 2010 U.S. Dist. LEXIS 79647 (S.D.N.Y., Aug. 5, 2010).

[13] Now it might be the case that removal of the false claim and maintaining the price might result in reduced quantity sold. Some consumers who valued the falsely advertised attribute might not want to pay the same price once they believe that the attribute is no longer included in the product. However, price did not change and a hedonic analysis in this instance would show the attribute to have no value even when it actually did have value to some consumers. The producers' power to set its prices in this instance made hedonic analysis unreliable.

[14] Anstine *supra* note 9.

[15] The direction of a preference is reflected in the sign of a coefficient (positive or negative) of the product attribute in the hedonic price regression.

[16] Chang *supra* note 8; Lin, B. T. Smith, and C. Luang, "Organic Premiums of Fresh Produce," *Renewable Agriculture and Food Systems*, 23(3), Sep 2008, pp. 208-16.

[17] A producer can sell an organic, brown egg from a cage-free hen but that type of egg will not be unique to that seller. Hence, eggs are not differentiated products as per the economic literature.

[18] When two or more of the independent variables in a regression model (in this example, brand and the chip uniformity feature) are highly correlated, the model is said to exhibit multi-collinearity. Since the idea behind a regression is that the coefficient on an independent variable is an estimate of the marginal effect of that variable on the dependent variable holding all other variables constant, multi-collinearity can be a problem. In a model exhibiting multi-collinearity, the coefficients of the regression are imprecise due to the existence of large standard errors. See Robert S. Pindyck and Daniel L. Rubinfeld, "The Effects of Multicollinearity" *Econometric Models and Economic Forecasts*, Irwin-McGraw Hill, 1998, 96.

[19] Taylor, L. O. "The Hedonic Method." In *A Primer on Nonmarket Valuation*, eds., P. A. Champ, K. J. Boyle, and T. C. Brown, pp. 331–393. Norwell, MA: Kluwer Academic Publishers, 2003.