

Hedonic Price Regressions in False Advertising Class Actions

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Legal Disclaimer

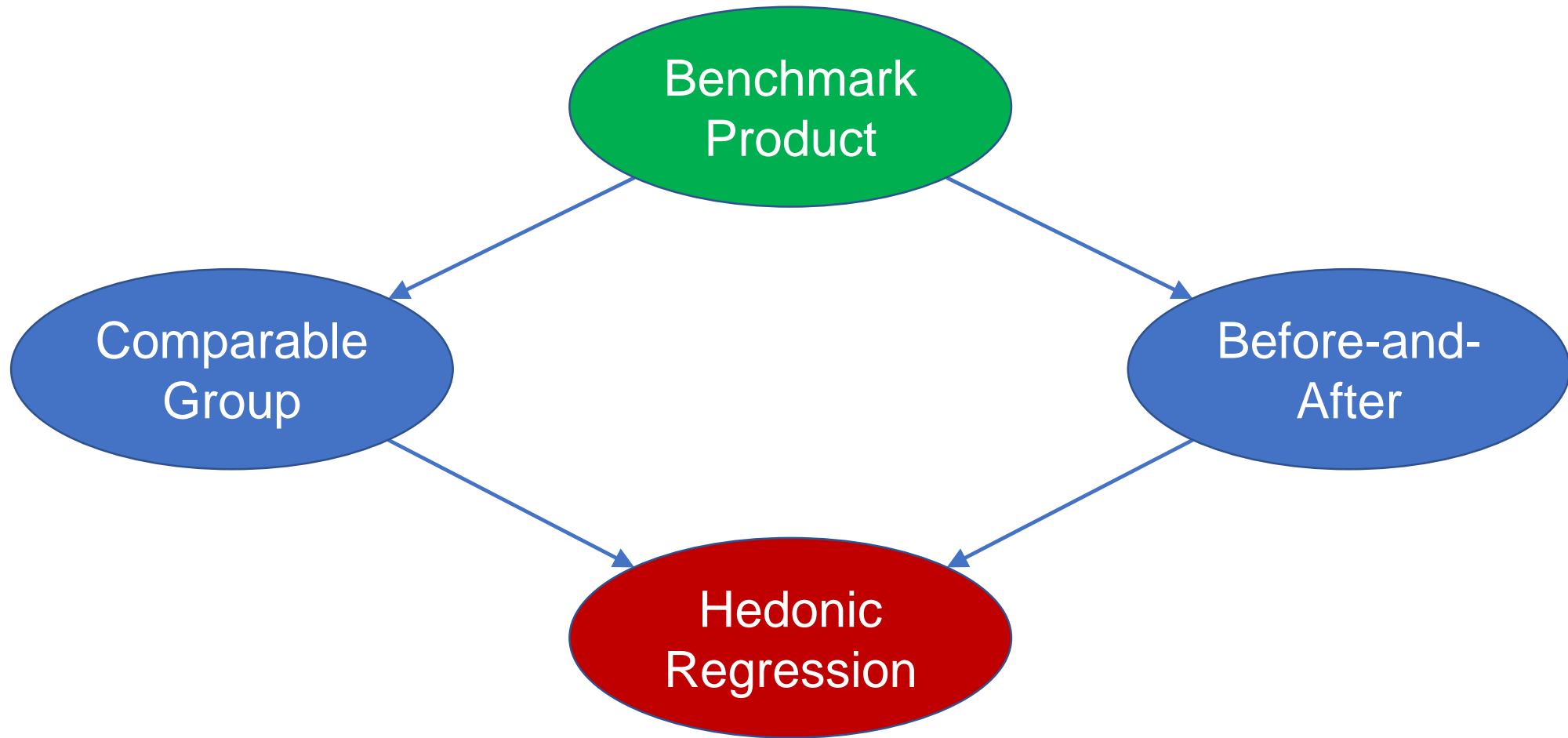
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Determining “Value” in a False Ads Class Action

Damages (or “Price Premium”): Difference between the price paid by a consumer and the “value” actually received

- Actual price
 - Consumer receipts
 - Point-of-sale records
 - Nielsen/IRI surveys
 - Loyalty cards
- “Value” received
 - Personal value or “willingness to pay”
 - Potential problem for class: Likely to vary by consumer
 - **Market value**
 - The price that would have prevailed but for the misrepresentations

Evolution of Market-Based Methods for Measuring “But-For” Price



What Is a Hedonic Price Regression?

Key Assumptions

- A consumer good is comprised of attributes
- Attributes affect consumer utility
- Attributes are costly to provide
- Competition drives prices to reflect costs

- Under these conditions, a regression of prices on product attributes can lead to estimates of the impact of individual attributes on price
 - Waugh (1928): Impact of quality features on price
 - Lancaster (1966): Consumer utility as a function of product features
 - Rosen (1974): Formalized idea that market prices can be functions of product features

Basic Structure

Example: Single-Family Housing

$$P = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \gamma_1 Z_1 + \gamma_2 Z_2 + \varepsilon$$

Diagram illustrating the regression equation for single-family housing price. The equation is $P = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \gamma_1 Z_1 + \gamma_2 Z_2 + \varepsilon$. Blue arrows point from descriptive labels to the variables in the equation: "interest rates" points to X_1 , "lumber price" points to X_2 , "school dist." points to X_3 , "sq. footage" points to Z_1 , and "corner lot" points to Z_2 .



P Sales price of house

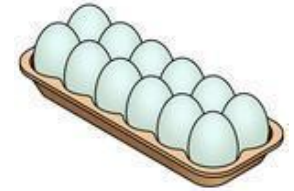
X_i Economy-wide factors affecting demand (income, interest rates) and supply (labor costs, energy prices); and local factors (school district, traffic)

Z_j Variables for features: dummy (corner lot, swimming pool); non-dummy (# bedrooms, sf)

Under proper conditions, coefficients γ_i provide estimates of the market value of each feature

Typical Applications

- 1) Housing
- 2) Consumer durables
- 3) Produce/commodities



Key Characteristics of These Markets

- Limited number of important attributes
- Attributes are quantifiable and easily measured
- Consumer preferences for attributes are (reasonably) predictable
- Competitive marketplace

Potential Problem Cases: Branded Consumer Products



- Large number of hard-to-define attributes/ingredients
- Highly differentiated
- Importance of advertising and specific labels
- Limited academic literature applying hedonics to such products

Potential Issues with Branded Consumer Products

- Difficult to develop a priori hypotheses about coefficients
 - Do more calories increase/decrease price? Chocolate flavor?
- Potential multicollinearity between brand and feature of interest
 - May be difficult to find other-branded products with/without the particular misrepresentation
- Large number of attributes: what to include?
 - Omitted variable problems
- Brands often have some pricing power
 - Example: Line pricing
- Little variation in price from day to day and store to store
 - Thousands of transactions, actually very little information

Under these conditions, coefficients on feature variables may not represent the impact of features on price (i.e., may not provide estimates of “but-for” pricing or “price premium”)

Takeaway

- For hedonic regression to work, the product market and available data must meet certain conditions
 - Regression is a tool, not a panacea
- Like most statistical analyses, the results can be highly sensitive to choices made by the analyst
- The more competitive the market, and the broader range of included products/features, the better chance the coefficients will make sense
- Common-sense tests (before-and-after or benchmark-product), and thorough analysis of the marketplace can be very helpful



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