

# A Quality-Adjusted Price Index for Colorectal Cancer Drugs

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# This is an important paper

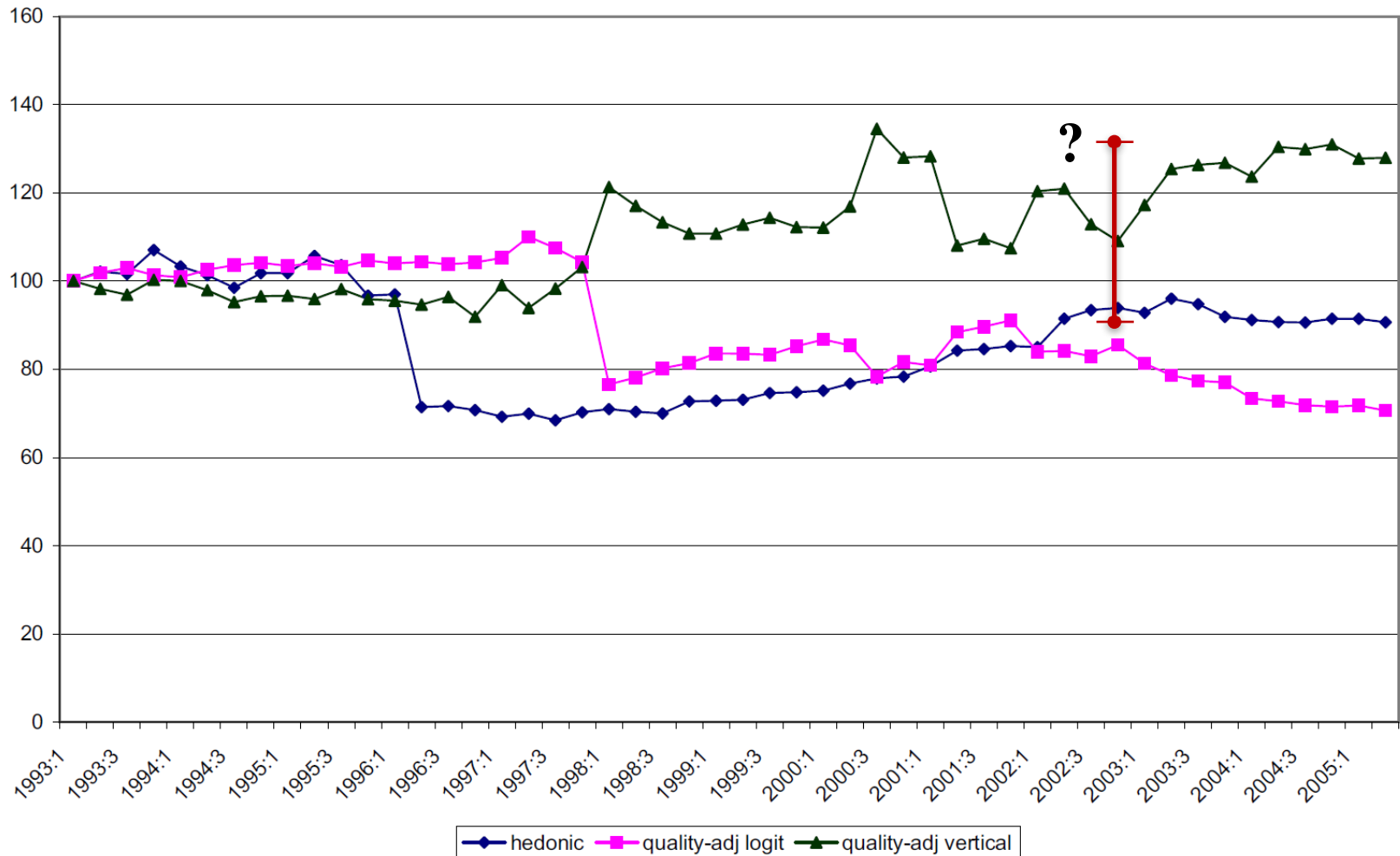
- ▶ Presents 3 price indices showing that quality-adjusted prices of cancer drugs were essentially unchanged during the period of new drug introductions
- ▶ Derives FDA measure of expected quality-adjusted life years (QALYs)
- ▶ Takeaway: branded drug companies recover drug development investments with returns commensurate with their value to patients

# Some ways to improve the paper

- ▶ Provide variance of the price index estimates
- ▶ Provide verification and disclosure of the Instrumental Variables analysis
- ▶ Provide missing definitions of terms and variables

# Provide Standard deviations of the price index estimates

Figure 4: Hedonic and Quality-Adjusted Price Indices



# Provide verification and disclose the Instrumental Variables (IV) analysis

- ▶ An IV should be uncorrelated with the outcome variable (market share) for reasons beyond its effect on the endogenous regressor (regiment drug prices), but well-correlated with that endogenous regressor for reasons that the researcher can explain and **verify**.
- ▶ The authors state that the selected IV will be correlated with price, but uncorrelated with the unobserved characteristics of the drug regiment

# Provide verification and disclose the Instrumental Variables (IV) analysis

- ▶ Authors claim to have selected “the number of products in the market and the sum of observed characteristics of the competitors (which the literature assumes as exogenous and provides a sense of how crowded is the product space)” as their Ivs
- ▶ Authors should **verify** by showing that the “number of products in the market” is actually correlated with price
- ▶ Authors should **verify** by showing that the “sum of observed characteristics of the competitors” is actually correlated with price. How could there have been **any** competitors to the brand during the patent term?
- ▶ Authors should provide the IV model specification equation, and the full correlation **results** including partial  $R^2$  and the F statistic of the identifying instruments in the first-stage estimation as evidence that estimates are consistent and free from finite sample bias.[1].

[1]. John Bound, David A. Jaeger, and Regina M. Baker, “Problems With Instrumental Variables Estimation When the Correlation Between the Instruments and the Endogenous Explanatory Variable Is Weak,” 90 *Journal of the American Statistical Association* 443 (June 1995).

# Provide missing definitions of terms and variables

- ▶ Undefined variables:
  - $\varepsilon_{ij}$  in last equation, p. 11
  - $P(\varepsilon)$  in first equation, p.12

**THANK YOU!**