Comment on " Product Downsizing and Hidden Price Increases"

16 October 2013
Economic Measurement
Group Workshop
Data Gaps and Economic
Measurement

Masahiro Higo
Research and Statistics
Department
Bank of Japan

Overview of Imai and Watanabe paper

- This paper studied the following points by using large-scale scanner data (2000-2012).

(1) How often did enterprises reduce the size or weight of products to increase effective prices?

(2)Accompanied with change of nominal prices?

(3) How did consumers response to product downsizing?   Is it the same as that in increasing nominal prices?

(4) What is the implication for quality adjustments in compiling price indexes (e.g. CPI) ?
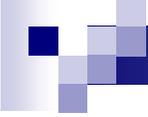
Main Findings (1)

(1) One third of product replacements was accompanied with a size or weight reduction. The number of size/weight reductions significantly increased in 2007 and 2008.

(2) In some cases enterprises also reduced nominal prices in product downsizing.   But the extent of reducing price was less than that of product downsizing.→ effective price increased

 -- Product downsizing by 1 percent associated with price decline by only 0.45 percent.   The effective prices increased by 0.55 percent in each replacement.

Main Findings (2)

(3) Consumers are sensitive to size or weight changes as they are to price changes. The change in quantities sold at product downsizing almost equals to that at nominal price increasing.

It implies that Japanese consumers are rational and are different from U.S. consumers.

(4) The results on price and size/weight do not contradict quality adjustments based on per-unit prices.   The Japanese CPI may be downward biased by imperfect implementation of adjustments.

Comments

(1) Are Consumers still sensitive to size or weight changes as they are to price changes when we focus not on quantities sold but on consumption (effective quantities adjusted by size or weight) ?

(2) How do we interpret the positive constant-term coefficient in the estimation for the consumer response equation (Table 5) ?

(3) Is Japanese CPI downward biased or not ? Trying to give further considerations.

(1) Sensitivity of consumers to product downsizing vs. to price increase

· Seeing responsiveness of not quantities sold (=q) but consumption (=q+x) to the effective price changes (=π-x) in two cases.

· Consumers are more sensitive to product downsizing (Case2) than to price increase (Case1).

(Demand equation in whole sample)
q=0.41-0.72π＋0.55 x

Case	π－x	π	x	q	q＋x
1	+10%	+10%	0%	-7.2%	-7.2%
2	+10%	0%	-10%	-5.5%	-15.5%

(1) Sensitivity of consumers (cont)

■ But if using the estimation of demand equation in samples with only product downsizing, the result is different; consumers are sensitive to product downsizing as they are to price reduction.

-- The discrepancy in q+x between case1 and case2 is not significantly different from zero.

(Demand equation in only sample with product downsizing)

$q=0.37-0.96\pi+0.36\ x$

| Case	$\pi-x$	π	x	q	q+x
1	+10%	+10%	0%	-9.6%	<u>-9.6%</u>
2	+10%	0%	-10%	-3.6%	<u>-13.6%</u>

(1) Sensitivity of consumers (cont2)

- Should focus on not quantities sold but consumption (= effective quantities adjusted by size or weight) in evaluating responsiveness of consumers.

- May use the estimation result for demand equation in only downsizing sample because there is a possibility that the reactions of consumers are different among downsizing, no change with size or weight and upsizing cases.

(2) Why the constant-term coefficient γ is positive in estimation for demand equation?

- It means that quantities sold on average increased after replacement of products.

- A possible interpretation may be that introducing new products made quantities increase because new products were more attractive. But one third replacements were only downsizing replacements without the change of product content or quality.

- May estimate the demand equation without the constant-term.
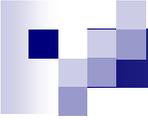
(3) Is Japanese CPI downward biased?

- This paper's results on price and size/weight possibly support quality adjustments based on per-unit prices.

- It strongly encourages me because the Bank of Japan use "unit price comparison method" as one of quality adjustment methods in Corporate Good Price Index and Corporate Services Price Index.

  ---- In "unit price comparison method" the quality of products is assumed to be proportional to the quantity of products and prices are measured per unit of size, weight and number.

(3) Is CPI downward biased (cont) ?

■ In CPI, "adjustment by the ratio of quantity method" has been used as quality adjustment method based on per-unit prices.

■ The number of product replacements (downsizing) adjusted by the ratio of quantity method in CPI also increased in 2007 and 2008. ⇔same as scanner data

< Number of product replacements adjusted by the ratio of quantity method in CPI >

year	00	01	02	03	04	05	06	07	08	09	10	11	12
total	3	1	1	3	1	3	1	7	11	7	3	3	5
upsizing	1	1	0	1	0	0	0	1	3	1	0	1	0
downsizing	2	0	1	2	1	3	1	6	8	6	3	2	5

(3) Is CPI downward biased (cont2) ?

■ Under qualitative analysis, CPI seemed to be appropriately quality-adjusted in product replacements with product downsizing.

■ I don't think that there is enough clear evidence to infer from scanner data whether CPI was downward biased after 2000, though it is a very interesting question.

■ Need to quantitatively evaluate whether impacts of quality-adjustments in product replacements with size or weight changes are larger, in CPI or in scanner data.

Thanks for your attention!

Masahiro Higo

Research & Statistics Department

Bank of Japan

masahiro.higo@boj.or.jp