Comments on
Menu costs and price change distributions: evidence from Japanese Scanner Data

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Organization of my presentation

- Quick summary of the findings of the paper
- Comment 1: Definition of price changes
- Comment 2: Small menu cost approximation?
- Comment 3: Symmetric assumption of target price distribution
- Comment 4: Common target price volatility grouping?
- Comment 5: US-Japan comparison
- Comment 6: Effect of deflation and inflation
- Comment 7: Duration independence of distribution?
- Comment 8: Positive duration-large price change correlation?

Summary of Findings

- Investigate the statistical properties of prices from daily scanner data for all products sold at 181 supermarkets for 1988-2005. Total number of products 284,000. Total number of observations 290 million for one year, 2.9 billion for entire sample!

- Use this highly detailed data to examine the implications of the menu cost hypothesis. Three main findings are:
  (i) Small price changes are rare which supports menu cost models
  (ii) Increasing duration of no price change results in higher chance of large price change
  (iii) In the long-run price change distribution becomes asymmetric possibly due to deflation

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- Investigate the statistical properties of prices from daily scanner data for all products sold at 181 supermarkets for 1988-2005. Total number of products 284,000. Total number of observations 290 million for one year, 2.9 billion for entire sample!

- Use this highly detailed data to examine the implications of the menu cost hypothesis. Three main findings are:
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  (ii) Increasing duration of no price change results in higher chance of large price change
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- **An important set of empirical findings** which helps our further understanding of price setting mechanism ... but is it necessary to make a connection to menu cost models?

Comment 1: Definition of price changes

In page 5,

We then define the index showing the occurrence of price adjustment as

$$I_{it}^{d} \equiv \begin{cases} 1 & \text{if} \quad P_{it} \neq P_{it-d} \\ 0 & \text{if} \quad P_{it} = P_{it-d} \end{cases} \tag{2}$$

If one or multiple price adjustments occur between day $t-d$ and day t, then I_{it}^{d} becomes 1. On the other hand, if no price adjustment occurs during this period, I_{t}^{d} is 0.

- Which one to use? Both seem to be interesting.

Comment 2: Small menu cost approximation?

In page 8,

$$I_{it}^d \equiv \begin{cases} 0 & \text{if} \quad (1+h_i)^{-1} \leq \frac{P_{it}^*}{P_{it-d}} \leq 1 + h_i \\ 1 & \text{otherwise} \end{cases} \tag{3}$$

$$\Pi_{it}^d = \frac{P_{it}^*}{P_{it-d}}. \tag{4}$$

This pricing rule, with an additional assumption that h_i is sufficiently small relative to the volatility of the target price,[3] implies

$$I_{it}^d \equiv \begin{cases} 0 & \text{if} \quad (1+h_i)^{-1} \leq \Pi_{it}^{*d} \leq 1 + h_i \\ 1 & \text{otherwise} \end{cases} \tag{5}$$

and

$$\Pi_{it}^d = \Pi_{it}^{*d}. \tag{6}$$

[3] Under this assumption, P_{it}^*/P_{it-d} is almost equal to P_{it}^*/P_{it-d}^*.

- Observed price always optimal? If menu cost is very small won't it be almost identical to flexible price case?

Comment 3: Symmetric assumption of target price distribution

"the gross inflation rate for the target price, which is assumed to have a symmetric distribution." (page 9)

$$\Pr\left[\Pi_{it}^{*d} \geq 1+\xi\right] = \Pr\left[\Pi_{it}^{*d} \leq (1+\xi)^{-1}\right] = ab.$$

- Possible?

Comment 4: Common target price volatility grouping?

$$\Pr\left[I_{it}^{d}=1\right]=a \tag{10}$$

$$\Pr\left[\Pi_{it}^{d}\geq 1+\xi \mid I_{it}^{d}=1\right]=\Pr\left[\Pi_{it}^{d}\leq (1+\xi)^{-1} \mid I_{it}^{d}=1\right]=b \tag{11}$$

where a and b are parameters ranging between zero and unity. These two equations, together with equation (9), indicate that the products collected in this way should satisfy

$$\Pr\left[\Pi_{it}^{*d}\geq 1+\xi\right]=\Pr\left[\Pi_{it}^{*d}\leq (1+\xi)^{-1}\right]=ab. \tag{12}$$

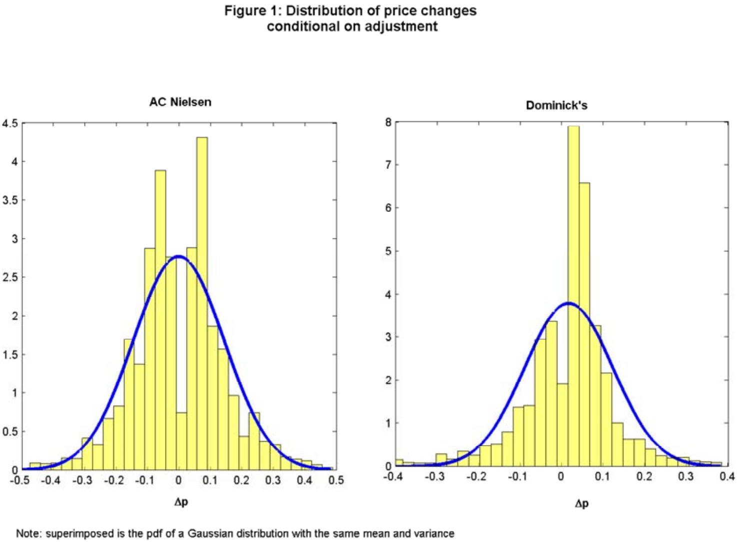
- $a = 0.1$ and $b = 0.2$
- $a = 0.2$ and $b = 0.1$
- Can it increase sample size in a group of same volatility of the target price and same h_i?

Comment 5: US-Japan comparison

"Using the U.S. scanner data, Midrigan(2006) find that a price change distribution has tails fatter than those of a normal distribution, and that density at the vicinity of zero inflation is greater than those of a normal distribution. Our finding is consistent with the first one, although it is in sharp contrast with the second one." (pages 12-13)

- What about a dent at center - one of the main finding?
- Multi-products with a common menu cost (Midrigan, 2006)?
- Multi-sector menu cost model (Nakamura-Steinsson, 2007)?

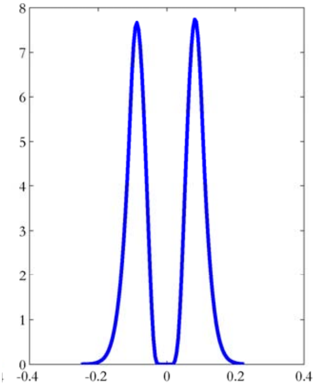
Comment 5: US-Japan comparison



Source: Midrigan (2006)

Comment 5: US-Japan comparison

Predicted distribution of price changes from a single product menu cost model of Golosov-Lucas (2007)



Japan better explained by multi-sector or multi-menu cost models rather than US case even if current paper relies on grouping?

Comment 6: Effect of deflation and inflation

Asymmetric distribution on a long time scale is found.

"we may allowed to interpret this asymmetry as reflecting deflation deflation during this period." (page 16)

"... there was another asymmetry at the beginning of the 1990s... The observed asymmetry might have arisen from such an inflationary pressure in the Japanes economy." (page 16)

- Can we observe larger magnitude of price change? - more direct implication of inflation on menu cost models
- Ahlin-Shintani(2007) show wider (sS) band during higher inflation period

Comment 7: Duration independence of distribution?

Two clear implications of menu cost models (pages 16-17):

- First, the hazard function should be upward sloping.
- Second, the price change distribution should be independent of price duration.

Really?

1. Conditional probability of price change

$$\Pr[\Pi_{it} > 0 | \text{no price change between } t-1 \text{ and } t-n] \Uparrow$$

2. Conditional distribution of price change

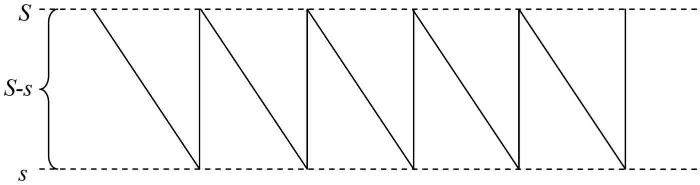
$$\Pr[\Pi_{it} \leq x | \text{no price change between } t-1 \text{ and } t-n]$$

same for any x?

Comment 7: Duration independence of distribution?

Sheshinski-Weiss (1977) type menu cost model with constant inflation

Relative price (relative to aggregate price)



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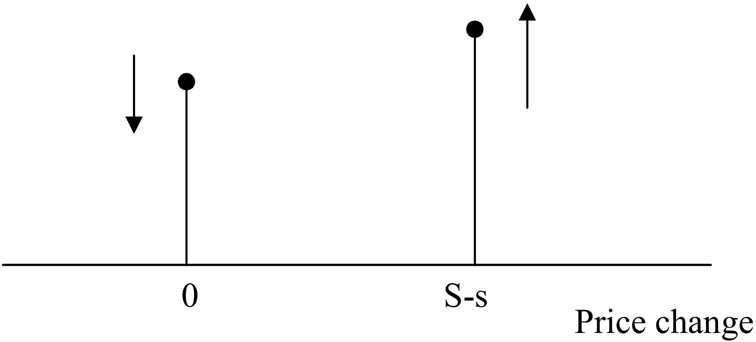
Sheshinski-Weiss (1977) type menu cost model with constant inflation

(Conditional) probability mass function

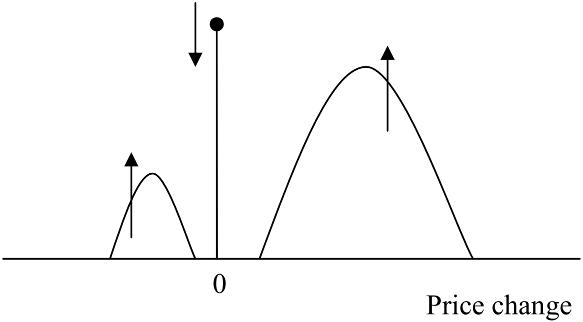


This implies increasing hazard function

Comment 7: Duration independence of distribution?

Golosov-Lucas (2007) type menu cost model with technology shocks and stochastic inflation

(Conditional) probability density function

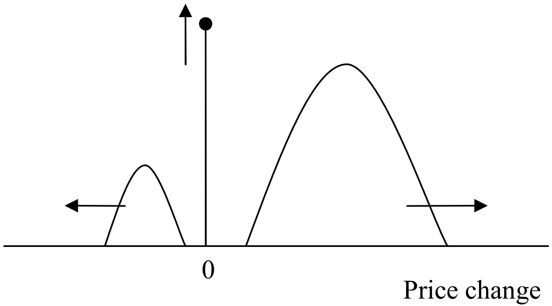


If it is duration independent, (conditional) pdf cannot change

Comment 8: Positive duration-large price change correlation?

Implication to tail probability depends on the specification
Second implication violated already?

Decreasing hazard function detected from data



What type of menu cost models predict this? Need to rely on simulation?