Discussion of: Uniform Pricing in US Retail Chains

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Motivation (in my mind):

- Lack of state contingency in pricing

Lack of State Contingency

- Price Rigidity
  - Restaurant prices remain unchanged for months
  - Consumer packaged goods have a lot of sales; but often return to *identical* levels following sales
  - Why not index to the inflation rate
- Simple Contracts
  - Why isn't there more state contingent contracting
  - Index wages to inflation, interest rates etc.

In the cross section:

- Lemon-Lime and Arctic Blitz Gatorade cost *exactly* the same amount (McMillan, 2007)
  - Demand curves and costs are different
  - Leslie (2004): Similar facts for Broadway theater prices
- Many things (demand curve, competition, etc.) can affect how much prices should vary cross-sectionally
  - But *exactly* the same in nominal terms
  - \$1 in 2006 ≠ \$1 in 2007; \$1 in NY ≠ \$1 in Minneapolis
  - Sales taxes vary across states!
- If it's efficient, seems like a big coincidence.

Macro Models of Near-Optimal Prices

- Simple adjustment cost models
  - Fixed cost of adjustment ("menu cost")
  - Fixed probability of adjustment ("Calvo")
- Mankiw (1985), Akerlof-Yellen (1985):
  - Near-optimal prices yield only second-order profit losses to a monopolist
  - CES, monopolistic competition

Near-Optimal Prices: Implications for Macro

- If prices adjust efficiently:
  - Recessions are mostly driven by supply shocks (e.g. productivity) as opposed to demand shocks (e.g., animal spirits, household wealth etc.)
  - So government policy response typically isn't justified
  - Also, fiscal and monetary policy don't do much (because they are also demand shocks)
- Not true if prices adjust sluggishly (Keynesian economics)

What Do Managers Say?

- Implicit contracts, customer antagonism etc.
  - Blinder et al (1998): "Asking About Prices"
  - Many follow-up surveys with similar results
  - Downward nominal wage rigidity: worker morale (Bewley, 2002)
- Managerial/ Decision-making costs
  - Dutta et al (2003): Ethnographic study of price adjustment at a large firm
- Survey evidence suggests "technological" costs of price adjustment are unimportant

This Paper

Two provocative elements:

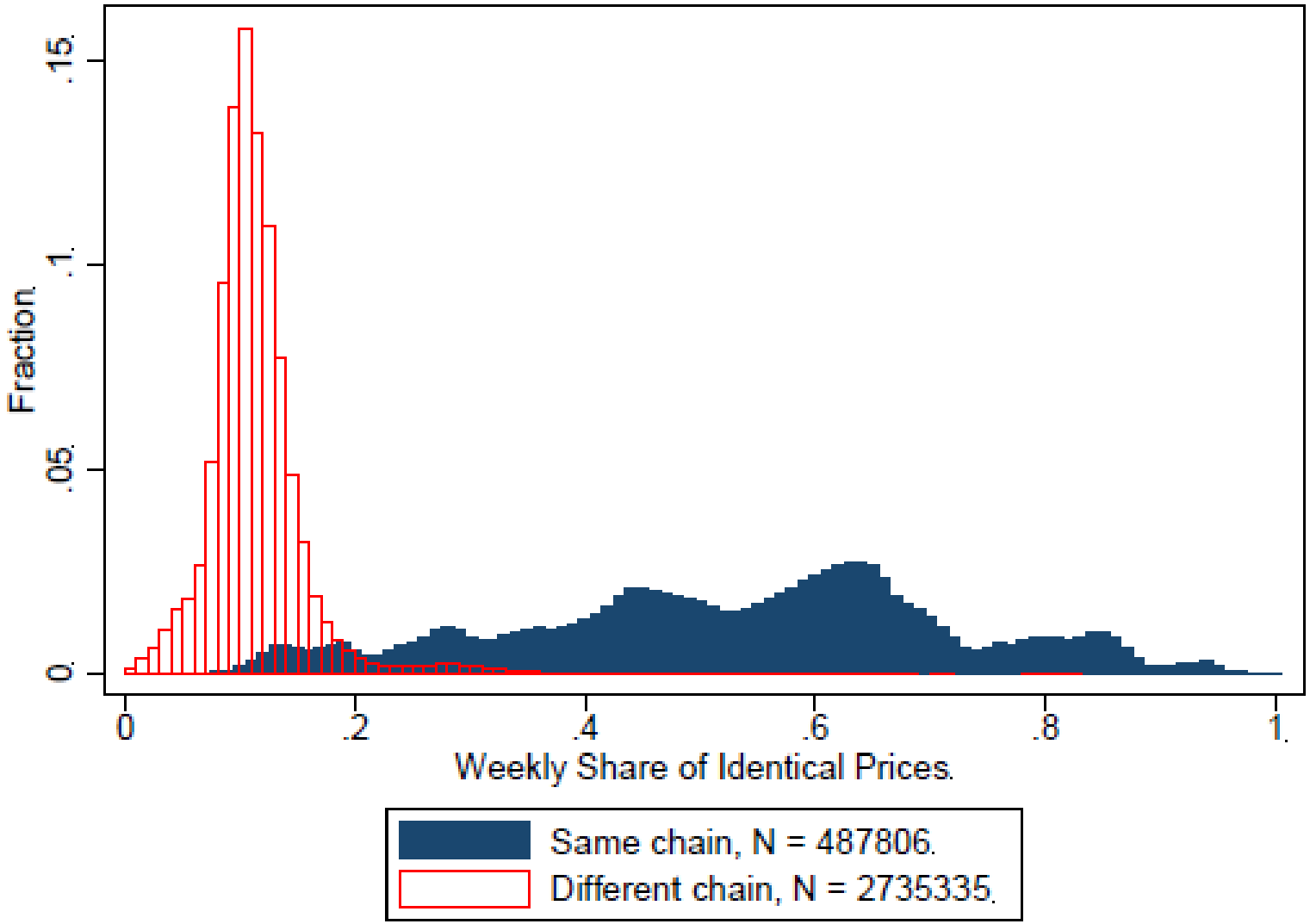
1. Very (?) sub-optimal pricing
2. Estimating demand curves with OLS

Classic Idea: Markup is a Function of Income

ESTIMATED PARAMETERS OF THE DEMAND AND PRICING EQUATIONS: BLP SPECIFICATION, 2217 OBSERVATIONS

Demand Side Parameters	Variable	Parameter Estimate	Standard Error	Parameter Estimate
Means ($\bar{\beta}$'s)	*Constant*	−7.061	0.941	−7.304
	HP/Weight	2.883	2.019	2.185
	Air	1.521	0.891	0.579
	MP$	−0.122	0.320	−0.049
	Size	3.460	0.610	2.604
Std. Deviations (σ_β's)	*Constant*	3.612	1.485	2.009
	HP/Weight	4.628	1.885	1.586
	Air	1.818	1.695	1.215
	MP$	1.050	0.272	0.670
	Size	2.056	0.585	1.510
Term on Price (α)	$\ln(y-p)$	43.501	6.427	23.710

Figure 3c. Share of Identical Prices



Price vs. Income

Figure 5. Price versus Store-Level Income

Figure 5a. Price versus Income: Within-Chain

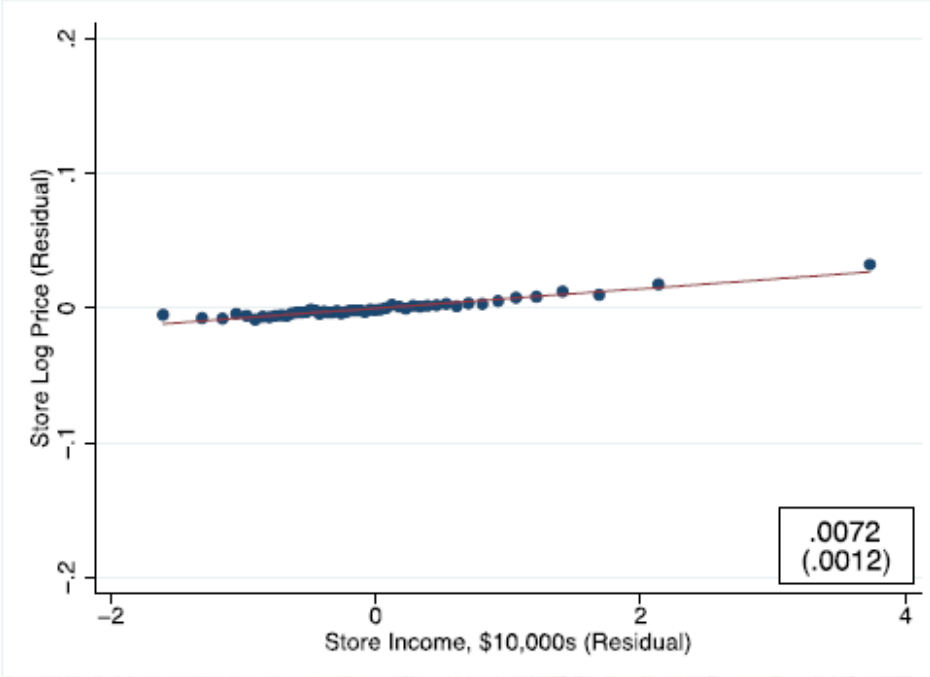


Figure 5b. Price versus Income: Between Chains (Fo

How Suboptimal?

- Big (implausible) coincidence that identical prices are exactly optimal
- "How" sub-optimal? Need a model for that.
- Many more assumptions required
  - Demand
  - Market structure
  - Costs
- This paper: Monopolistic competition, CES
  - Avoids having to specify "outside option"

Many Possible Questions

- Monopolistic competition vs. Oligopoly
- CES vs. Discrete choice
- Are costs really the same across markets? (Wages, Implicit rent presumably lower)
- Is competition really the same across markets?

(Many robustness checks, but hard to be watertight)

One Challenge: What is Marginal?

- Real estate prices lower in low income places
- Della Vigna and Gentzkow argue this shouldn't affect marginal costs much since this is a small fraction of marginal costs
- Depends on the definition of "marginal"
  - You need a bigger store to sell more stuff
  - Space is fixed at high frequencies but variable at low frequencies
  - (P-MC/P) is approx. 30-50% but profits (excluding overhead) are an order of magnitude less

Profit Loss Estimates

How much money is on the table?

- Profit losses are 7% of profits
- Equivalent to 0.35% of revenue

Is this big or small?

Menu Cost Estimates

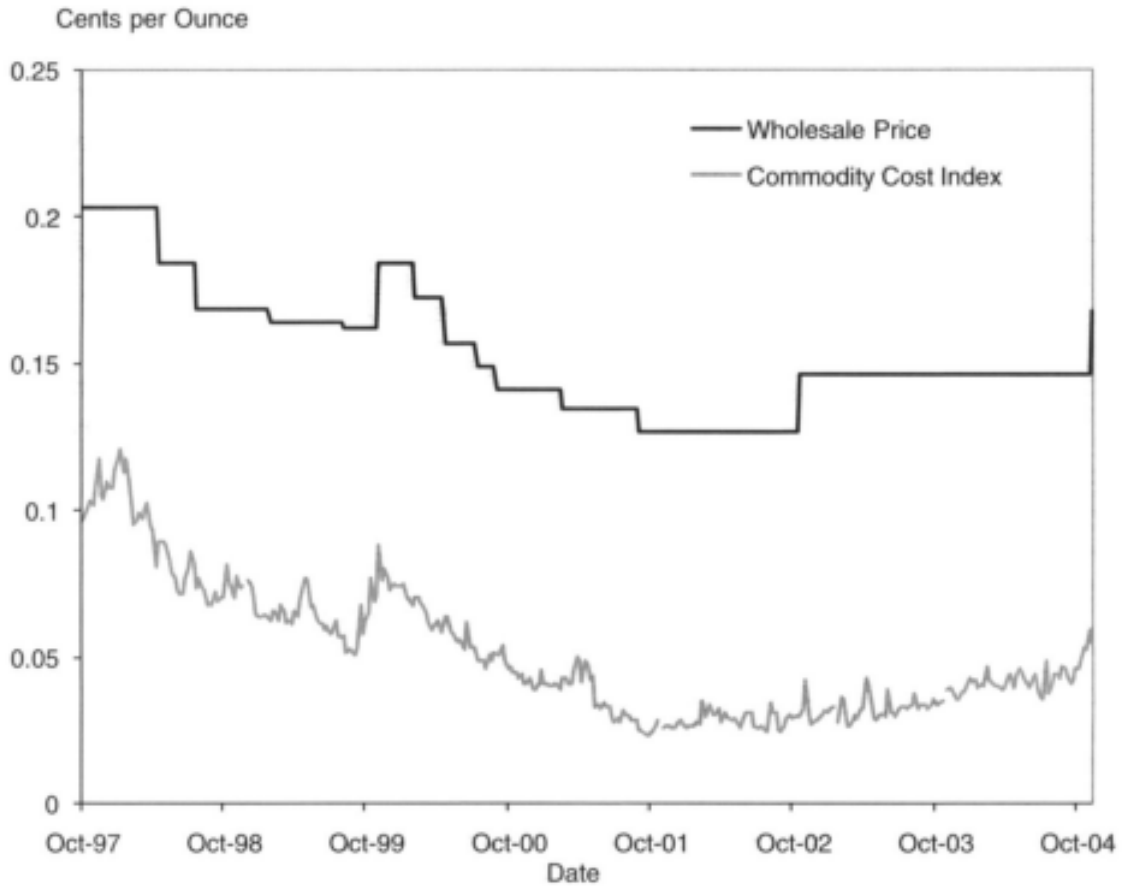


FIGURE 2

A typical wholesale price series

he wholesale price depicted is for a leading coffee brand. The coffee commodity index is the "composite commodity dex" discussed in Section 2. The gap in the retail price series from November 1998 to September 1999 arises due missing data.

Menu cost of 0.2% revenue required to generate rigidity

(Other estimates: Aguirregabiria, Levy et al < 1%)

Profit Loss Estimates: Interpretation

- Menu cost <1% revenue often framed as "second order" in macro literature
- Large relative to "technological" costs of price adjustment
  - Safeway had $36bn in revenue (2015): 0.35% is $100m per year
- But survey/ethnographic evidence doesn't suggest technological factors are important
  - And there's no evidence that firms with higher average store sales have more flexible prices (As one would expect with fixed absolute cost)
  - Suggestive of customer/managerial explanations, which might scale with size

Customer Antagonism: Zara

Carvalho et al. (QJE, 2014)

- Zara prices are *identical* across countries within the Euro area
  - Despite massively different incomes etc.
- But different for Denmark
  - Denmark has a different currency
  - But a strong peg vs. Euro
  - So why does this matter?

Perhaps consumers are offend by "obvious" price discrimination (when currency is the same)

Do Profit Losses Pass Smell Test?

- Large "money" on the table might imply firms with more flex prices more profitable
  - Plausible biases would tend to overstate profit benefits of flexibility
  - "Smart" firms have more flexible prices
- Not in the data
  - Perhaps hard to detect statistically?
  - 0.3% is small relative to annual standard deviation of revenues
  - Or perhaps negative long-run effects of non-uniform pricing?

Selected Sample

- One might worry about how general the phenomenon studied in this paper
- Main sample: one UPC from canned soup, cat food, chocolate, coffee, cookies, soda, bleach, toilet paper, yogurt and orange juice
- Goal: avoid selection due to stockouts
  - But could worry the results aren't general

I suspect it is general

If you do a variance decomposition of retail price time series in AC Nielsen data you get (Nakamura, 2008):

- 16% Product
- 17% Idiosyncratic
- 2% Store
- **65% Chain**

Similarly, if you do a variance decomposition of frequency of price change across products and stores:

- Most cross-sectional variation in price rigidity at the **chain** level (Nakamura et al, 2011)

Consistent with managerial or customer-based theories

Contributions

Two provocative elements:

1. Very (?) sub-optimal pricing
2. Estimating demand curve with OLS

Didn't I learn in undergrad I wasn't allowed to do this?

OLS Often Implausibly Low

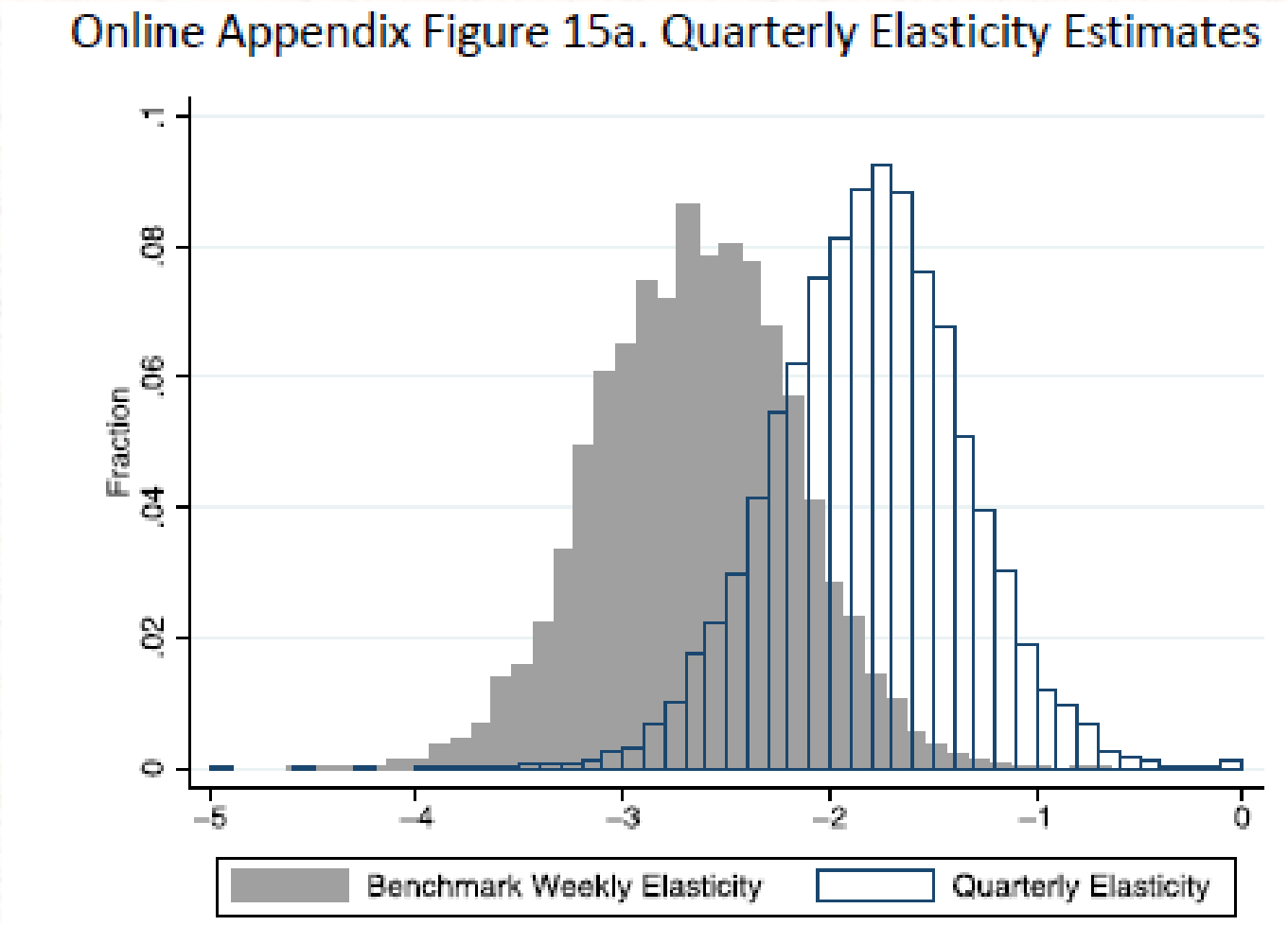
AUTOMOBILE PRICES

TABLE III

RESULTS WITH LOGIT DEMAND AND MARGINAL COST PRICING
(2217 OBSERVATIONS)

Variable	OLS Logit Demand	IV Logit Demand	OLS ln (*price*) on *w*
Constant	−10.068	−9.273	1.882
	(0.253)	(0.493)	(0.119)
Price	−0.089	−0.216	—
	(0.004)	(0.123)	
No. Inelastic Demands (+/− 2 *s.e.'s*)	1494 (1429–1617)	22 (7–101)	*n.a.*
R^2	0.387	*n.a.*	.656

This Paper: Elasticities in Line with Literature



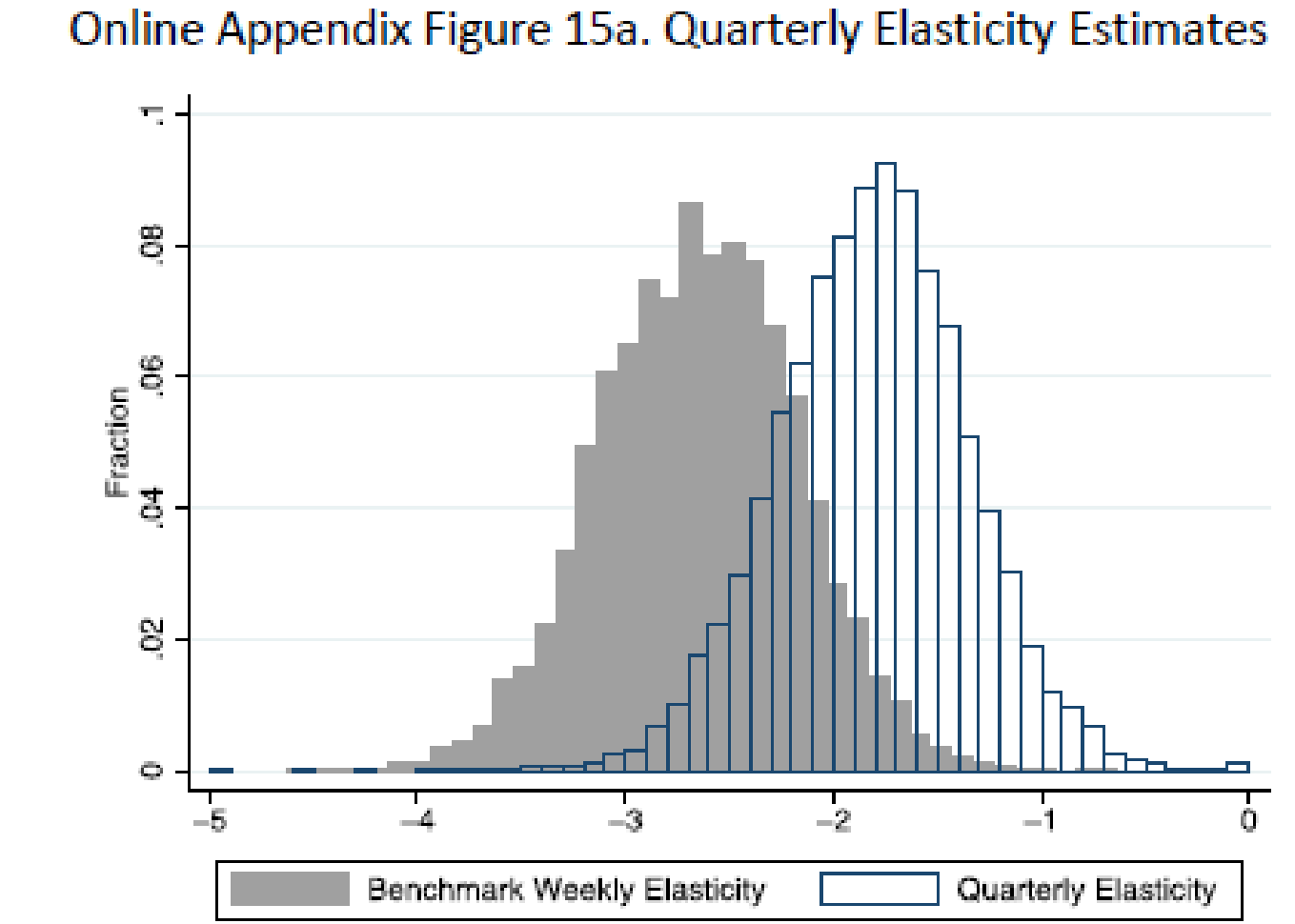
Why might OLS Work?

- Price variation is from time series (vs. focus on cross-section in much of the literature)
- What causes price fluctuations?
  - Sales occur continuously as opposed to being bunched on e.g. Superbowl
  - Unlikely to be preference/productivity shocks
  - Suppose they are essentially random (e.g., Varian model of sales)
- High frequency price variation reflects supply shocks

Potential Bias: Stockpiling

- Demand responses to "sales" dominated by stockpiling (Hendel and Nevo, 2006)
  - Could lead elasticities to be too high

Monthly vs. Quarterly



Lower Elasticities Raise Profit Losses

- Might have thought higher elasticity would *raise* profit losses from sub-optimal prices
  - Pricing "errors" more costly
- Actually goes the opposite direction!
  - Lower elasticity implies bigger variation in optimal prices
  - This effect dominates
- Profit losses are *much* larger for parameterizations with lower elasticities (sometimes uncomfortably so)

Conclusion

- Fascinating, important paper
- Deeply related to macro and international literature on price rigidity
- Exactly identical prices hard to explain *except* by some kind of pricing friction
- Quantitative estimates depend on functional firm of demand, market structure etc.
- OLS to estimate demand curves with high frequency time series data
  - Does not yield inelastic demand