Using List Prices to Collude or to Compete?

Public list prices, bargaining discounts, and information

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Introduction

The question for today

Why can a publicly announced **list price** matter if important buyers privately negotiate discounts?

- The common view: list prices may be visible, but they are often not the prices actually paid.
- Courts and firms sometimes treat them as weak evidence because discounts are private.
- The paper asks whether that view misses a mechanism.

- The key idea is not that everyone pays the list price.
- The key idea is that the list price changes bargaining incentives and downstream competition.
- This is an information problem: who observes what, and when?

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The central puzzle

Puzzle

If supermarkets and other large buyers negotiate private discounts, why should public list-price announcements affect transaction prices?

- A list price could look like cheap talk.
- A large buyer can say: "I will not pay that number."
- If every important deal is private, the public signal seems irrelevant.

- But the public list price affects the large buyer's outside environment.
- It changes how aggressively small buyers compete.
- That changes what can be bargained over.

The authors and their research agenda

Diego Cussen

- Ph.D. student in Economics at NYU.
- Fields: **industrial organization** and **applied econometrics**.
- His work connects vertical relations, Nash-in-Nash bargaining, equilibrium computation, and data.

Juan-Pablo Montero

- Full professor at PUC-Chile; Ph.D. MIT.
- Fields: **industrial organization**, environmental economics, energy, and resources.
- A recurring theme is how rules, information, and market power shape outcomes.

Sources: Diego Cussen website; Juan-Pablo Montero CV; Cussen and Montero (2024), *Economic Journal*.

The motivating case: Chile's egg market

Before October 2018

- Egg producers published list prices weekly in a newspaper.
- The information was simultaneous, centralized, and easy to observe.
- Small buyers mostly paid list prices.

After the interruption

- The publication suddenly stopped.
- Prices continued to circulate, but in a more opaque, decentralized, and asynchronous way.
- The paper treats this as a move from public to private list prices.

What happened to prices?

Approximate prices

	Before	After
List / small buyers	97.8	86.2
Large buyers	79.7	76.8
Discount	18.1	9.4

Unit prices in pesos.

Pattern to explain

- List prices fell by about 15 percent.
- Transaction prices for large buyers fell by about 4 percent.
- Discounts became much smaller.

The large-buyer price also moved, even though large buyers did not simply pay the list price.

The regression behind the numbers

Before-and-after specification

$$w_{ilt} = \alpha + \gamma\, Post_t + \beta\, Large_i + \phi\,(Large_i \times Post_t) + \mu' X_{ilt} + \delta' Y_t + \varepsilon_{ilt}.$$

Objects

- w_{ilt}: unit wholesale price paid by buyer i in municipality l on day t.
- $Post_t$: after the newspaper interruption.
- $Large_i$: supermarket or retail-chain buyer.

Reading the table

- γ: list-price change for small buyers.
- $\gamma + \phi$: transaction-price change for large buyers.
- β and $\beta + \phi$: large-buyer discount gap before and after.

Full regression table

	(1)	(2)	(3)	(4)
Large	−18.114***	−23.580***	−18.172***	−23.894***
	(2.322)	(3.200)	(2.325)	(3.052)
Post	−11.678***	−13.905***	−13.142***	−13.560***
	(3.489)	(3.475)	(3.505)	(3.413)
Post × Large	8.691***	10.894***	8.520**	11.317***
	(3.279)	(3.207)	(3.506)	(3.207)
Corn price index	–	–	0.167***	0.391***
	–	–	(0.024)	(0.048)
Constant	108.224***	113.327***	92.440***	75.350***
	(2.045)	(2.952)	(3.478)	(6.135)
Observations	200,566	108,723	200,566	108,723
F-test, p-values				
$\gamma + \phi = 0$	0.000	0.000	0.000	0.000

Dependent variable: effective wholesale prices for large white eggs. Columns (1)–(2) use the baseline specification in 22- and 12-month symmetric windows. Columns (3)–(4) add year and month-of-year fixed effects and the corn price index. All models include day-of-week, supplier, and municipality fixed effects. Standard errors are clustered at the municipality level. $^{**}p < 0.05$, $^{***}p < 0.01$.

Three prices, three roles

Public list price

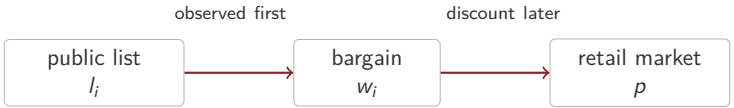
Announced before bargaining and observed by suppliers, large buyers, and small buyers.

Private list price

The price offered to small buyers, but not publicly announced before large-buyer bargaining.

Negotiated price

The price large buyers pay after bargaining with suppliers.



The information-economics lens

The simple idea

A public list price does not only report a number. It changes what agents can credibly expect about the bargaining environment.

- **Transparency**: everyone observes the same object.
- **Timing**: it is observed before bargaining.
- **Beliefs**: it coordinates expectations about what small buyers will pay.

- If small buyers pay more, they compete less aggressively.
- Large buyers benefit downstream.
- Suppliers can bargain back part of that benefit.

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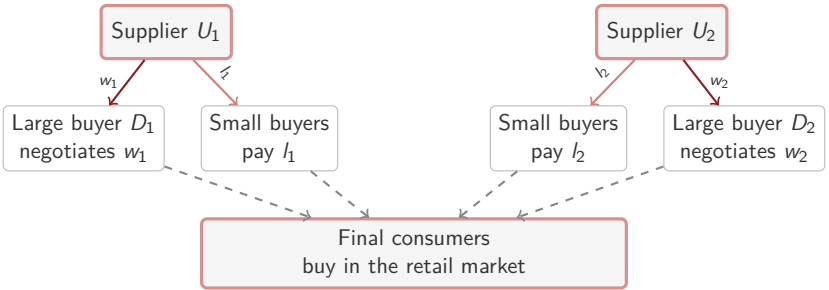
The vertical architecture



Key point

Large and small buyers have different bargaining power, but they compete for the same final consumers.

Why buyer asymmetry matters

Small buyers

- No meaningful bargaining power.
- Mostly accept the offer they receive.
- Their input cost is the list price l_i.

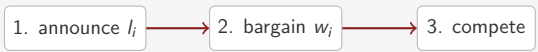
Large buyers

- Bargain bilaterally with suppliers.
- Pay negotiated prices w_i.
- Often receive discounts off list prices.

The same upstream price change affects the two buyer groups differently.

Public versus private timing

Public list prices



The large buyer observes the small buyer's input price before bargaining.

Private list prices

The large buyer forms expectations about l_i while bargaining.

The mechanism is transparency before bargaining, not transparency alone.

Why the timing is economically powerful

Think of the list price as a state variable

When l_i is public before bargaining, the large buyer and supplier bargain knowing how strong the small buyers will be in the retail market.

- Higher l_i makes small buyers less competitive.
- The large buyer expects more residual demand.
- That raises the total surplus in the large-buyer channel.
- Bargaining splits incremental surplus.
- So the supplier can obtain a higher w_i.
- The negotiated price moves even though it is not the list price.

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Players and objects

The baseline model

There are two suppliers, two large buyers, and a continuum of small buyers. Production costs are normalized to zero.

Object	Meaning	Paid by
l_i	list price of supplier U_i	small buyers
w_i	negotiated wholesale price	large buyer D_i
p	retail price	final consumers
γ	competitiveness of small buyers	model parameter

The model is simple on purpose: it isolates the information and bargaining channel.

Final demand

Inverse demand

$$p = a - \sum_{i=1}^{2} q_i - \sum_{i=1}^{2} q_i^F .$$

- q_i is the quantity sold by large buyer D_i.
- q_i^F is the quantity sold by the fringe of small buyers linked to supplier U_i.
- All downstream sellers face the same final consumers.

Small buyers

Small-buyer fringe

$$q_i^F = \gamma(p - l_i).$$

- If the retail price p rises relative to the input price l_i, small buyers sell more.
- If l_i rises, they become less aggressive.
- γ captures how effective small buyers are.
- A larger γ means the fringe reacts more strongly to margins.

Residual demand for large buyers

Substitute the small-buyer supply

$$p = a - q_i - q_j - \gamma(p - l_i) - \gamma(p - l_j).$$

Rearranging,

$$(1 + 2\gamma)p = a + \gamma(l_i + l_j) - q_i - q_j = \tilde{a} - q_i - q_j.$$

- The object $\tilde{a} = a + \gamma(l_i + l_j)$ is not a new demand primitive.
- It is the residual demand shifter created by small buyers' input costs.
- Higher list prices weaken the fringe and raise the residual demand faced by large buyers.

Downstream competition

After wholesale prices are known

Large buyer D_i chooses q_i to maximize $(p - w_i)q_i$, taking q_j as given. The Cournot first-order condition gives:

$$q_i(w_i, w_j) = \frac{\tilde{a} - (2w_i - w_j)(1 + 2\gamma)}{3}, \qquad \tilde{a} = a + \gamma(l_i + l_j).$$

- Higher w_i makes D_i less aggressive.
- Higher list prices l_i, l_j change the residual demand faced by large buyers.
- This is why upstream list prices enter downstream competition.

The retail price

Equilibrium retail price

$$p(w_i, w_j) = \frac{\tilde{a}/(1+2\gamma) + w_i + w_j}{3}.$$

Direct reading

Wholesale prices matter because they affect how large buyers compete downstream.

Indirect reading

List prices matter because they affect the strength of the small buyer fringe through $\tilde{a}$ and q_i^F.

What is bargained over?

Large buyer and supplier bargain over w_i

The negotiated price is not chosen in isolation. It is chosen after both sides compare what happens if they agree and what happens if they do not.

On path

They agree on w_i. The supplier sells through D_i and also sells to small buyers at l_i.

Off path

They fail to agree. The supplier can still sell through small buyers, but the large buyer earns zero from that relationship.

Agreement payoffs

If U_i and D_i agree on w_i

$$\widehat{\pi}_{D_i} = \pi_{D_i}(w_i, w_j) = (p(w_i, w_j) - w_i)q_i(w_i, w_j) = \frac{q_i(w_i, w_j)^2}{1 + 2\gamma},$$
$$\widehat{\pi}_{U_i} = w_i q_i(w_i, w_j) + l_i\gamma\big(p(w_i, w_j) - l_i\big).$$

- $\widehat{\pi}_{D_i}$ is the large buyer's downstream profit when the relationship is active.
- $\widehat{\pi}_{U_i}$ includes sales to D_i and sales through the small-buyer fringe.

Disagreement payoffs

If U_i and D_i fail to agree

$$\overline{\pi}_{D_i} = 0, \qquad \overline{\pi}_{U_i} = l_i\gamma(\overline{p} - l_i),$$

where

$$\overline{p} = \frac{\tilde{a}/(1+2\gamma) + w_j}{2}.$$

- The buyer gets zero from this relationship if the negotiation breaks down.
- The supplier can still serve small buyers at l_i.
- The bar marks the outside option used in the Nash product.

The Nash bargaining product

Given the expected price w_j in the other negotiation

$$w_i^N(w_j) \in \arg\max_{w_i} \underbrace{(\widehat{\pi}_{U_i} - \overline{\pi}_{U_i})}_{\Delta_i^U} \underbrace{(\widehat{\pi}_{D_i} - \overline{\pi}_{D_i})}_{\Delta_i^D}.$$

- Δ_i^U is the supplier's incremental surplus from agreement.
- Δ_i^D is the large buyer's incremental surplus from agreement.
- Public list prices matter because they move p, $\overline{p}$, and therefore both increments.

The bargaining rule

Best response in the bargaining stage

$$w_i^N(w_j) = \frac{a + (1 + 2\gamma)w_j + \gamma(4l_i + l_j)}{8(1 + 2\gamma)}.$$

Symmetric Nash-in-Nash outcome

$$w_i^{NB}(l_i, l_j) = \frac{3a + \gamma(11l_i + 4l_j)}{21(1 + 2\gamma)}.$$

This is the key mathematical bridge from list prices to negotiated prices.

Reading the bargaining rule

Own-list-price effect

$$\frac{\partial w_i^{NB}}{\partial l_i} = \frac{11\gamma}{21(1+2\gamma)} > 0.$$

- Raising l_i weakens small buyers.
- That makes the large buyer stronger downstream.
- The total surplus in the U_i-D_i relationship rises.
- Bargaining shares that extra surplus.
- Supplier U_i captures part of it as a higher w_i.
- This is why public list prices can move transaction prices.

Why pass-through is incomplete

The pass-through is positive but below one

$$0 < \frac{\partial w_i^{NB}}{\partial l_i} = \frac{11\gamma}{21(1+2\gamma)} < 1.$$

- If a list-price increase passed through one-for-one, the large buyer would be worse off.
- But the bargaining problem starts from the fact that the large buyer has gained from weaker small-buyer competition.
- Therefore, the negotiated price rises, but by less than the list price.

This explains why discounts can shrink or expand without disappearing.

The supplier's trade-off

Supplier U_i has two profit channels

$$\widehat{\pi}_{U_i}(l_i, l_j) = w_i^{NB}(\cdot)\, q_i(w_i^{NB}(\cdot), w_j^{NB}(\cdot)) + l_i\gamma(p - l_i).$$

Large-buyer channel

A higher l_i helps negotiate a higher w_i and shifts demand toward the large buyer.

Small-buyer channel

A higher l_i raises the margin on small buyers, but also reduces their quantity.

Public-list-price equilibrium

Proposition 1

With public list prices, the one-shot game has:

$$l_i^{\mathrm{pb}} = \frac{43}{147 + 149\gamma} a, \qquad w_i^{\mathrm{pb}} = \frac{21 + 52\gamma}{(1 + 2\gamma)(147 + 149\gamma)} a < l_i^{\mathrm{pb}}.$$

- The supplier wants a list price high enough to improve bargaining.
- But not so high that sales to small buyers become too small.
- The equilibrium list price solves that trade-off.

Discounts emerge endogenously

Discount ratio

$$\frac{l_i^{\mathrm{pb}}}{w_i^{\mathrm{pb}}} = \frac{43(1+2\gamma)}{21+52\gamma} > 1.$$

Reason 1

Small buyers create downstream pressure. Keeping $l_i > w_i$ softens their competition.

Reason 2

List-price increases are not passed through one-for-one to negotiated prices.

What changes with private list prices?

Private timing

Suppliers no longer announce list prices before bargaining with large buyers. The list-price offer to small buyers and the bargaining with large buyers happen at the same time.

- The large buyer must form expectations about l_i during the negotiation.
- Supplier U_i cannot use a public announcement to commit to a high small-buyer price before bargaining.
- This weakens the commitment value of the list price.

Private-list-price equilibrium

Proposition 3

With private list prices:

$$l_i^{\mathrm{pr}} = \frac{5}{3(7+8\gamma)}a, \qquad w_i^{\mathrm{pr}} = \frac{3+7\gamma}{3(1+2\gamma)(7+8\gamma)}a < l_i^{\mathrm{pr}}.$$

- Discounts still exist.
- But public announcements allow a stronger commitment to high list prices.
- Therefore public list prices can support higher l_i and higher w_i than private list prices.

The competitive implication

Proposition 4

If suppliers compete, moving from public to private list prices leads to:

- lower prices for small and large buyers;
- smaller discounts for large buyers;
- more sales by small buyers;
- fewer sales by large buyers.
- lower retail prices;
- lower supplier profits;
- lower large-buyer profits.

Public list prices soften competition even without collusion.

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Mechanism 1: the commitment effect

Intuition

In competition, a public list price lets a supplier commit before bargaining. Without that commitment, the supplier is tempted to give better terms to small buyers later, making retail competition tougher.

Mechanism 2 starts from a collusion problem

Only large buyers

If there were only large buyers, suppliers using linear wholesale prices would have one instrument w_i for two conflicting goals:

- soften downstream competition by raising input costs;
- share enough surplus with large buyers so that the arrangement is acceptable.

Small buyers give suppliers an additional way to affect the downstream game.

Mechanism 2: multi-buyer contact

Difference from multi-market contact

The buyer groups are not independent markets. Collusion over one group spills over to the other because both groups meet in the retail market.

Collusion: the incentive constraint

Repeated agreement

Suppliers choose high list prices to maximize joint profits, but each supplier could deviate with a lower list price.

$$\widehat{\pi}_{U_i}(l_i, l_j) \geq (1-\delta)\widehat{\pi}_{U_i}(l_i^d, l_j) + \delta\widehat{\pi}_{U_i}(l_i^{\mathrm{pb}}, l_j^{\mathrm{pb}}).$$

- With public list prices, deviations are observed before bargaining.
- This lowers the payoff from deviating.
- Public observability therefore helps sustain the agreement.

Collusion with public list prices

Proposition 2, main case

If suppliers are patient enough and $\gamma \lesssim 0.7$:

$$l_i^{\mathrm{cpb}} = \frac{17}{49 + 27\gamma} a > l_i^{\mathrm{pb}}, \qquad w_i^{\mathrm{cpb}} = \frac{7 + 16\gamma}{(1 + 2\gamma)(49 + 27\gamma)} a > w_i^{\mathrm{pb}}.$$

- Small buyers sell less.
- Large buyers sell more.
- Total sales fall.
- Suppliers earn more.
- Large buyers also earn more.
- Final consumers lose.

Why private list prices make collusion harder

Communication

With private list prices, large buyers must believe that small buyers will pay high prices. Explaining this can leave evidence and may pull large buyers into the collusive story.

Monitoring

With public list prices, a deviation in l_i is detected before bargaining. With private list prices, all prices are determined at the same time, making deviations harder to punish quickly.

Proposition 5

Moving from public to private list prices raises the critical discount factor required to sustain collusion: $\delta^{\mathrm{pr}} > \delta^{\mathrm{pb}}$.

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Institutional link: FNE and TDLC

The same Chilean episode also reached competition institutions

The FNE investigated Chilehuevos, the Chilean egg producers' association, for disseminating commercially sensitive information in the egg market, mainly through *Revista del Campo* of *El Mercurio*, until 2018.

Institutional outcome

- The FNE and Chilehuevos signed an extrajudicial agreement.
- The TDLC approved it on September 15, 2023.
- Reference: TDLC AE No. 27-23; FNE investigation Rol 2477-17.

How to say it carefully

- This was not a TDLC cartel conviction.
- It does show that list-price communication in this market was a real antitrust concern.
- That makes the paper's mechanism directly relevant for Chilean competition policy.

Sources: FNE press release, September 15, 2023; TDLC Extrajudicial Agreement AE No. 27-23.

Why the evidence is hard to read

Main lesson

The same price pattern can be generated by two different stories.

Competitive story

Public list prices act as a commitment device. Removing them makes competition tougher and lowers prices.

Collusive story

Public list prices help communication and monitoring. Removing them weakens collusion and lowers prices.

Price movements alone are not enough. We need quantities, discounts, and market structure.

Two practical screens

1. Expansion of small buyers

If removing public list prices strongly expands small buyers' market share and diversifies their purchases, that is more consistent with prior collusion that had weakened or excluded them.

2. Elimination of discounts

If discounts disappear after moving to private lists, the earlier list-negotiated gap may have been sustained by collusion rather than by the competitive commitment effect.

For the egg market

Discounts fell sharply but did not disappear. The evidence fits the theory, but by itself it does not separate competition from collusion.

Takeaways

Three ideas to keep

- List prices are not only numbers. They are information, timing, and commitment.
- In wholesale-retail markets, a high list price for small buyers can improve suppliers' negotiated terms with large buyers.
- The same price pattern can come from collusion or softened competition, so case analysis needs structure beyond prices.

Thanks ;)