Fair Pricing and Channel Coordination

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Fair Pricing

Fair pricing (FP) standards are commonly employed:

- Fair Trade: Cane sugar, cocoa, coffee, honey, etc.;
- Fair wages: Labor practices in the textiles industry;
- Fair prices: Farm prices under EGAlim law in France.

FP standard requires that farmers receive a minimum share of the retail food dollar.

In this paper, we:

1. Identify FP as a novel form of vertical restraint;
2. Demonstrate that a FP standard is equivalent to a constraint on buyer market power in upstream procurement markets, as expressed by the Lernex index of monopsony power.

Vertical Restraints

The use of vertical restraints is debated in the literature:

1. They can serve anticompetitive purposes by, e.g.:
    - Facilitating collusion (Jullien & Rey, 2007; Rey, 2020; Hunold & Muthers, 2024);
    - Softening price competition (Shaffer, 1991);
    - Creating incentives for exclusion (Asker & Bar-Isaac, 2014; Chambolle & Molina, 2023).
2. They can also resolve various externalities, e.g.:
    - Excessive retail price competition (Telser, 1960);
    - Double marginalization (DM): Spengler (1950); Mathewson & Winter (1984); Rey & Tirole (1986).
    - Excessive post-sale quality differentiation (Bolton & Bonanno, 1988).

FP has marketing appeal over other forms of vertical restraint by appealing to consumer notions of fairness

Contribution

Novel form of vertical restraint: Fair Pricing

- FP is a form of margin control
  - However, FP does not fix the retail margin ($p - w$)
  - FP fixes the margin between the retail price and farm price ($p - z$)
  - A FP arrangement by the manufacturer (M) and retailer (R) frees the wholesale price (w) for use as a tool for horizontal control

Novel role for vertical restraint: Upstream Market Power (UMP)

- Suppose M is a buyer who has UMP over farmers
  - R has incentive to set retail price "too low" by ignoring beneficial effect of a high retail price on reducing M's procurement cost
  - UMP offsets the DM effect on retail prices

What is a Fair Price?

FP is related to:

- Fairness and distributive justice (Fehr & Schmidt, 1999);
- Rent sharing in a vertical production system (Cui *et al.*, 2007)
- Fair trade: Guaranteed Min. Price (GMP)

FP standard (γ): share of industry rents that satisfy $\gamma z Q = \pi(p, z)$, that is $p = (1+\gamma)z$

Isomorphic concepts:

- Binding fairness standard: $p = (1+\gamma)z$
- Share of the food dollar (USDA): $z/p = 1/(1+\gamma)$
- Lerner index of monopsony power: $\gamma = (p-z)/z$

Fair pricing ("small" γ) places a guardrail on buyer market power

Model (i) - Framework

How can M use a fair pricing arrangement to control R's pricing of a competing retail good?

Horizontal control in the 2x2 case (2M, 2R)

We consider the case of intra-retailer differentiation with R1 and R2 that are multi-product retailers

- Good 1 (FP good): Produced by a dominant M
- Good 2: Competitively-produced substitute good (e.g., R's private label brand)

3-stage game:

- Stage 1: M proposes γ, w_1 and F to R
- Stage 2: Each R sets retail prices (p_1 and p_2)
- Stage 3: Markets clear

Model (ii) - Stage 3: Market clearing

For each good: $S^i(z_1, z_2) = D^i(p_1, p_2)$, $i = 1, 2$

- Demand: $D^i_i(p) < 0$, $D^i_j(p) > 0$, $|D^i_i| > D^i_j > 0$
- Supply: $S^i_i(z) > 0$, $S^i_j(z) < 0$, $S^i_i > |S^i_j| > 0$

Effect of retail price changes on the procurement prices paid to sellers:

$$\frac{\partial z_i(p)}{\partial p_i} = \frac{D^i_i S^j_j - S^i_j D^j_i}{\Delta} < 0$$

and

$$\frac{\partial z_j(p)}{\partial p_i} = \frac{S^i_i D^j_i - S^j_i D^i_i}{\Delta} \gtreqless 0$$

where $\Delta = S^i_i S^j_j - S^i_j S^j_i > 0$

Model (iii) - Cross-Market Effects and Diversion Ratios

Diversion ratios in demand are regularly used in antitrust analysis of horizontal and vertical mergers (Shapiro, 1995; Werden, 1996)

Demand-side diversion ratio measures the ability of a price discount on good i to divert sales away from good j

Here, both S-side and D-side diversion ratios are important:

- Demand-side diversion ratio: $\delta_i := -\frac{D_i^j}{D_i^i} \geq 0$
- Supply-side diversion ratio: $\alpha_i := -\frac{S_i^j}{S_i^i} \geq 0$

The cross-market effect depends on both types of diversion:

$$\frac{\partial z_j(p)}{\partial p_i} = \frac{(\alpha_i - \delta_i) S_i^i D_i^i}{\Delta} \stackrel{s}{=} \delta_i - \alpha_i$$

Model (iv) - Stage 2: Retailer's Problem

R1 and R2 are multi-product retailers ($j = 1, 2$)

- Set retail prices for $i = (1, 2)$ substitute goods
- R1 and R2 are located at the end-points of a unit line

Consumers derive utility from 1-stop shopping:

$$u(q_{1,j}, q_{2,j}) - \sum_{i=1,2} p_{i,j} q_{i,j} \quad \Longrightarrow \quad v_j^*(p_{1,j}, p_{2,j})$$

- Demand for R1 is given by the market share ϕ, with t the consumer's net preference for R2, $t \in [-\tilde{t}; \tilde{t}]$:

$$\phi = \frac{v_1^*(.) - v_2^*(.) + \tilde{t}}{2\tilde{t}}$$

- Price increase by R1 causes loss of store traffic ($d\phi/dp_{i,1} < 0$)

Consumer demand: $D^i(p_1, p_2)$ for good i at representative R1

Model (v) - No Contract Outcome

Collective Optimum: $\Pi_C := \max_{p_1,p_2} \sum_{i=1,2} (p_i - z_i(p))\, D^i(p)$

For (representative) R: R1's profit is $\phi\pi_R$, i.e.,

$$\phi \sum_{i=1,2} (p_i - w_i)\, D^i(p) = \phi \left[\Pi_C - (w_1 - z_1(p))\, D^1(p)\right]$$

$$\frac{\partial \pi_R}{\partial p_1} = \phi \left[\frac{\partial \Pi_C}{\partial p_1} - (w_1 - z_1) D^1_1 + D^1 \frac{\partial z_1}{\partial p_1}\right] + \left[\Pi_C - (w_1 - z_1) D^1\right] \frac{\partial \phi}{\partial p_1} = 0$$

$$\frac{\partial \pi_R}{\partial p_2} = \phi \left[\frac{\partial \Pi_C}{\partial p_2} - (w_1 - z_1) D^1_2 + D^1 \frac{\partial z_1}{\partial p_2}\right] + \left[\Pi_C - (w_1 - z_1) D^1\right] \frac{\partial \phi}{\partial p_2} = 0$$

First term in square brackets is the intra-retailer effect

- Departure from collective optimum depends on [DM + UMP] effect

Remaining terms is inter-retailer effect (competition reduces R prices)

- $d\phi/dp_i < 0$: loss of store traffic reduces sales

Model (vi) - The Cross-Market DM + UMP effect

DM + UMP effects differ for good 1 and good 2:

- Good 1: DM raises p_1, while UMP reduces p_1 from collective opt.
- Good 2: UMP effect can offset of reinforce DM effect

Consider the intra-retail margin for good 2 (e.g., monopoly R):

$$\frac{\partial \Pi_C}{\partial p_2} - (w_1 - z_1) D_2^1 + D^1 \frac{\partial z_1}{\partial p_2}$$

with:

- $(w_1 - z_1) D_2^1$ = R incentive to siphon sales away from DM good 1
- $D^1 \frac{\partial z_1}{\partial p_2}$ = UMP captures channel diversion effect of p_2 on z_1
  - Sign depends on relative magnitude of S and D diversion ratios

Model (vii) - M's Contract with R1

We examine vertical restraint in 2 cases:

- 2x1: M and competitive fringe sell to monopoly R
- 2x2: M and competitive fringe sell to duopoly R sector

M can write a contract that attains integrated optimal pricing for R:

- Fair pricing standard: γ^* s.t. $p_1 = (1+\gamma^*)z_1$
- Wholesale pricing with two-part tariff: $w_1 D_1 + F$

This allows us to characterize the optimal contract with respect to (γ^*, w^*)

- Fair pricing pins down p_1^* from M's choice of z_1^*
- Wholesale price w_1^* to control R1's price of good 2
- Rents redistributed between parties with F^*

Model (viii) - Contract Outcomes (2x1 case)

Condition on a FP standard that attains p_1^*, the optimal wholesale price for M is:

$$w_1^* - z_1(p^*) \stackrel{s}{=} \delta_2 - \alpha_2$$

Sign of the channel diversion effect ($\frac{\partial z_1(p)}{\partial p_2}$)	Wholesale price
$\frac{\partial z_1(p)}{\partial p_2} > 0 \Leftrightarrow \delta_2 > \alpha_2$	$w_1 > z_1$
$\frac{\partial z_1(p)}{\partial p_2} = 0 \Leftrightarrow \delta_2 = \alpha_2$	$w_1 = z_1$
$\frac{\partial z_1(p)}{\partial p_2} < 0 \Leftrightarrow \delta_2 < \alpha_2$	$w_1 < z_1$

When $\delta_2 = \alpha_2$, UMP effect vanishes for good 2

- $w_1 = z_1$ eliminates DM on good 1 $\implies p_2^*$

When $\delta_2 < \alpha_2$, p_2 discount by R raises $z_1 \implies p_2 < p_2^*$

- Below-cost sale by M ($w_1 < z_1$) raises R's margin on good 1, making selective price discounts on p_2 more costly for R

Model (ix) - Oligopoly case

R1 now must set p_2 to:

- Attract customers on the inter-retailer margin
  - **"business-stealing effect"** $\rightarrow$ lower p_2 to attract customers
- Allocate customers between brands within store
  - **"siphoning effect"** $\rightarrow$ adjust p_2 to shift purchases towards the good with the higher margin

Strength of substitution effect matters:

- Weak substitutes:
  - business stealing dominates siphoning effect
  - M reduces $w_1 < z_1$ to make siphoning more costly
- Strong substitutes: M increases $w_1 > z_1$

Model (x) - Contract Outcomes under Oligopoly

Strength of demand diversion	Retail goods are	Wholesale price
$\delta_2 < \delta_2^*$	Strong substitutes ($\eta < 0$)	$w_1 < z_1$
$\delta_2 < \delta_2^*$	Weak substitutes ($\eta > 0$)	$w_1 > z_1$
$\delta_2 > \delta_2^*$	Strong substitutes ($\eta < 0$)	$w_1 > z_1$
$\delta_2 > \delta_2^*$	Weak substitutes ($\eta > 0$)	$w_1 < z_1$

Model Extension: Constrained Fair Pricing

The optimal fair pricing standard (γ^*) may raise the margin on good 1 from non-contracted case, resulting in a "less fair" allocation.

We consider the requirement that "fair pricing" must increase the farmers share of the food dollar from the non-contracted case

Constraint:

$$\gamma \leq \gamma^U \equiv (p_1^U - z_1^U)/z_1^U$$

Where γ^U is the non-contracted margin for good 1

- If $\gamma^* < \gamma^U$ then contract can attain the integrated optimum
- If $\gamma^* \geq \gamma^U$ then the fairness constraint binds: $\gamma = \gamma^U$

Qualitatively similar outcome: Π_U replaces Π_C in cooperative optimum.

Conclusion

We consider fair pricing as a vertical restraint

- Novel role for vertical restraint: UMP of M ignored by R
- Novel form of vertical restraint: FP as "margin maintenance"
  - FP constrains margin between upstream and downstream market prices $(p - z)$
  - FP + buyer market power by M in setting z is equivalent to RPM

Fair pricing can be used to achieve horizontal control over the pricing of a rival "unfair" product

- R has incentive to discount competitively-produced product
- FP serves as a vertical restraint to induce R to raise p_2

Qualitatively similar outcomes for constrained vs. unconstrained FP