VERTICAL RELATIONS AND DOWNSTREAM MARKET POWER

by

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(PRELIMINARY AND INCOMPLETE)

Abstract

A well-known result in oligopoly theory regarding one-tier industries is that the equilibrium mark-up decreases with the number of firms. In a very general setting, we demonstrate that this standard inverse relationship may not always hold in the context of vertically related markets. We also show that, in contrast to the case of one-tier industries, the equilibrium mark-up and the Lerner index in the downstream market may move in opposite directions as a result of an increase in the number of downstream firms. We provide two specific examples in support of our general findings.

Keywords: Vertically related markets, Competition, Market power, Lerner index

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1 Introduction

Market power is defined as the ability of a firm to profitably raise the market price of a good or service above its marginal cost. A well-known result in oligopoly theory regarding one-tier industries is that the equilibrium mark-up, i.e., the difference between the equilibrium price and the marginal cost, decreases with the number of firms. In other words, market power is diminished when more firms are present in the market.

We demonstrate that this standard inverse relationship between market power and the number of firms does not always hold in the context of vertically related markets. In a very general setting, without specific demand functions for final goods and vertical relations between upstream and downstream firms, we derive conditions under which downstream market power may *increase* with the number of downstream firms. More specifically, we show that, when (i) the input price increases with downstream concentration and the pass-through rate, which measures the responsiveness of the final-goods price to changes in the input price, is less than one, and/or (ii) the input price decreases with downstream concentration and the pass-through rate is larger than one, the possibility of a positive relation between market power and number of firms in the downstream market arises.

Our analysis also reveals that, unlike the case of one-tier industries, the equilibrium mark-up and the Lerner index in the downstream market may move in opposite directions as a result of an increase in the number of downstream firms. An important implication of this finding is that depending on whether someone based his reasoning on mark-ups or the Lerner index, conclusions regarding the exercise of market power in the downstream market can be markedly different.

An increase in the number of downstream firms has a standard negative direct effect on final-goods price: for any given input price (marginal cost of downstream firms), a higher number of downstream firms imply lower final-good prices and thus lower mark-up in the market. However, it may also have an indirect effect on final-goods price working through the input price. When the indirect effect is negative, i.e., the input price decreases with the number of downstream firms, the final-goods price unambiguously falls. If the pass-through rate is less than one, the decrease in input price can be more pronounced than the decrease in final-goods price implying that the downstream mark-up increases with more downstream firms. Although downstream market power may increase, consumer prices still decrease with the number of downstream firms implying that higher market power does not necessarily imply lower consumer surplus. When the downstream mark-up increases, the downstream Lerner index also increases since final-goods price falls. Yet, *the downstream Lerner index may increase as a result of an increase in the number of downstream firms even when the mark-up falls*; this can well happen when the decrease in the mark-up is outweighed by the decrease in final-goods price.

On the other hand, when the indirect effect is positive, i.e., the input price increases with the number of downstream firms, the final-goods price may increase. When the pass through rate is larger than one, the increase in final-goods price can be more pronounced than the increase in input price implying that the downstream mark-up increases with more downstream firms. It is rather clear that in such case consumer surplus decreases with the number of downstream firms. Yet, *the downstream Lerner index may decrease as a result of an increase in the number of downstream firms even when the mark-up increases*; this can well happen when the increase in the mark-up is outweighed by the increase in final-goods price.

In Section 2 we demonstrate the above findings and related observations in a very general setting while in Section 3 we provide two specific examples in support of our general analysis. In the first example, we consider a successive Cournot oligopoly model with linear demand and upstream free entry, as in Matsushima (2006) and Ghosh & Morita (2007), whereas in the second, we consider an upstream monopoly and downstream Cournot oligopoly with non-linear demand, as in Tyagi (1999).

2 Model set-up and analysis

Consider an industry with two stages of production, upstream and downstream. At the upstream stage, there are $M \geq 1$ independent firm(s) that produce homogeneous or differentiated intermediate goods (inputs) with marginal production costs that can be decreasing, constant or increasing. At the downstream stage, there are $N \geq 1$ independent firm(s) that transform intermediate goods, in one-to-one proportion, into homogeneous or differentiated final goods. Each downstream firm faces the cost of obtaining the input from upstream supplier(s), w, and constant marginal production costs, c. Consumers' inverse demand for product i is given by $p_i = p_i(q_i, q_{-i})$, with $p_i, q_i, q_{-i} \geq 0$, and $(\partial p_i / \partial q_i) \leq (\partial p_i / \partial q_{-i}) < 0$, which implies that goods are imperfect substitutes, unless the first relation holds with equality, in which case there are perfect substitutes.

We assume that firms at both the upstream and the downstream stage can engage in either quantity (Cournot) or price (Bertrand) competition.[2] We do *not* specify a particular model of vertical contracting between upstream and downstream firms. There are different modelling choices regarding vertical relations, such as, bilateral contracting (take-it-or-leave-it offers or bargaining over linear or two-part tariff contracts) and/or "market interface" models (uniform contractual terms).[3] We require, however, that upstream decisions precede downstream decisions, i.e., agreements regarding the procurement of inputs precede competition in the final goods market.

The equilibrium mark-up for each individual downstream firm is given by $m = p^*(w^*) - w^* - c$, and the Lerner index by:

$$L = \frac{p^*(w^*) - w^* - c}{p^*} \tag{1}$$

In what follows, for convienience, we will drop superscripts (which denote equilibrium values) and the argument in p_i. Taking the derivative of the equilibrium downstream mark-up with respect to the number of downstream firms we obtain:

$$\frac{\partial m}{\partial N} = (\frac{\partial p}{\partial N} + \frac{\partial p}{\partial w}\frac{\partial w}{\partial N}) - \frac{\partial w}{\partial N} \tag{2}$$

where $\partial p / \partial w$ is the pass-through rate which measures the responsiveness of the final-goods price to changes in the input price.

[2]Naturally, we abstract from downstream Bertrand competition with homogeneous goods since in that case firms end up selling at marginal cost and thus lack market power.

[3]For a brief overview of models of vertical market relations see Inderst (2010) and Miklós-Thal et al. (2010).

Clearly, a change in the number of downstream firms has a negative direct effect on equilibrium final-goods price, i.e., $\partial p/\partial N < 0$. For any given input price (marginal cost of downstream firms), a higher number of downstream firms imply lower final-good prices and thus lower mark-up in the market. However, a change in the number of downstream firms may also have an indirect effect on equilibrium final-goods price working through the equilibrium input price. The indirect effect, $\partial w/\partial N$, can be positive, negative or zero. If $\partial w/\partial N = 0$, then the indirect effect vanishes and the analysis of downstream market power with respect to a change in downstream concentration is identical to the analysis performed in one-tier industries. If $\partial w/\partial N \neq 0$, however, then depending on the sign of $\partial w/\partial N$ and the magnitude of the pass-through rate $\partial p/\partial w$, the equilibrium downstream mark-up may increase with the number of downstream firms as the following Proposition indicates.

Proposition 1 *The equilibrium downstream mark-up increases with the number of downstream firms whenever the following holds:* $\frac{\partial p}{\partial N} > (1 - \frac{\partial p}{\partial w})\frac{\partial w}{\partial N}$. *The necessary, but not sufficient, conditions for this inequality to hold are:* (i) $\partial w/\partial N < 0$ *and* $\partial p/\partial w < 1$ *and/or* (ii) $\partial w/\partial N > 0$ *and* $\partial p/\partial w > 1$.

Proof. We require that $\partial m/\partial N > 0$. Using (2) and rearranging we have $\frac{\partial p}{\partial N} > (1 - \frac{\partial p}{\partial w})\frac{\partial w}{\partial N}$. Given that $\partial p/\partial N < 0$, the RHS of this inequality must be negative. It is therefore straightforward to obtain conditions (i) and (ii). ■

On the one hand, when $\partial w/\partial N$ is negative, then both the direct and the indirect effect work in the same direction implying that the final-goods price unambiguously falls. When the pass through rate is less than one, the decrease in input price can be more pronounced than the decrease in final-goods price implying that market power is enhanced with more downstream firms. Although downstream market power may increase, consumer prices still decrease with the number of downstream firms implying that higher market power does not necessarily imply lower consumer surplus.

On the other hand, if $\partial w/\partial N$ is sufficiently positive, then there is a possibility that final-goods price rises as a result of an increase in the number of downstream firms. When an increase in the number of downstream firms causes final-goods price to increase and the the pass-through rate is larger than one, then the increase in final-goods price may be more pronounced than the increase in input price implying that the equilibrium mark-up may increase with more downstream firms. It is rather clear that in such case consumer surplus decreases with the number of downstream firms.

We note here that the requirement that the pass-through rate being larger than one is particularly strong. Amir et al. (2004) point out that log-concavity is equivalent to pass-through rates being less than one, while log-convexity is equivalent to pass-through rates being larger than one. In order to have log-concavity it is sufficient that demand functions are concave or not too convex. Most demand functions that are widely used in Industrial Organization satisfy log-concavity, including linear demand. However, it is well known that there exist demand functions, such as the isoelastic demand, that are log-convex and thus have pass-through rates larger than one. The property of log-convexity is rather restrictive for a demand function since it requires demand functions that are too convex, and consequently profit functions that may not be concave.[4]

The analysis for the case of downstream Lerner index is similar and straightforward. Taking the derivative of downstream Lerner index with respect to the number of downstream firms we obtain:

$$\frac{\partial L}{\partial N} = \frac{(\frac{\partial p}{\partial N} + \frac{\partial p}{\partial w}\frac{\partial w}{\partial N})(1-L) - \frac{\partial w}{\partial N}}{p} \tag{3}$$

Proposition 2 *The downstream Lerner index increases with the number of downstream firms whenever the following holds:* $\frac{\partial p}{\partial N} > (\frac{1}{1-L} - \frac{\partial p}{\partial w})\frac{\partial w}{\partial N}$. *The necessary, but not sufficient, conditions for this inequality to hold are:* (i) $\partial w/\partial N < 0$ *and* $\partial p/\partial w < 1/(1-L)$ *and/or* (ii) $\partial w/\partial N > 0$ *and* $\partial p/\partial w > 1/(1-L)$*.*

Proof. We require that $\partial L/\partial N > 0$. Using (3) and rearranging we have $\frac{\partial p}{\partial N} > (\frac{1}{1-L} - \frac{\partial p}{\partial w})\frac{\partial w}{\partial N}$. Given that $\partial p/\partial N < 0$, the RHS of this inequality must be negative. It is therefore straightforward to obtain conditions (i) and (ii). ■

[4] For a comprehensive treatment of pass-through rates see Weyl & Fabinger (2013).

When conditions $\partial w/\partial N < 0$ and $\partial p/\partial w < 1$ are sufficient for the equilibrium downstream mark-up to increase with the number of downstream firms, then the Lerner index also increases since the final-goods price falls. However, when $\partial w/\partial N < 0$, it is easy to verify from Propositions 1 and 2, that the requirement that the mark-up increases with the number of firms is *more* restrictive than the corresponding requirement for the Lerner index implying that *the downstream Lerner index may increase as a result of an increase in the number of downstream firms even when the mark-up falls.*

On the other hand, when conditions $\partial w/\partial N > 0$ and $\partial p/\partial w > 1$ are sufficient for the equilibrium downstream mark-up to increase with the number of downstream firms, the effect on Lerner index is ambiguous since the final-goods price increases. When $\partial w/\partial N > 0$, the requirement that the mark-up increases with the number of firms is *less* restrictive than the corresponding requirement for the Lerner index implying that *the downstream Lerner index may decrease as a result of an increase in the number of downstream firms even when the mark-up increases.*

Therefore, unlike the case of one-tier industries, the equilibrium mark-up and the Lerner index in the downstream market may move in opposite directions as a result of an increase in the number of downstream firms. An important implication of this finding is that depending on whether someone based his reasoning on mark-ups or the Lerner index, conclusions regarding the exercise of market power in the downstream market can be markedly different.

3 Two examples

3.1 Successive Cournot oligopoly with upstream free entry and linear demand

We consider a successive Cournot oligopoly model where $N \geq 2$ downstream firms produce final goods using, in one-to-one proportion, a homogeneous input procured from $M \geq 2$ upstream firms. For simplicity, and without loss of generality, we assume zero marginal production costs both upstream and downstream. Upstream firms face the derived demand of downstream firms for the input. The linear and uniform input price is determined in an open market by the quantities supplied by the upstream firms. A standard reference for models with linear and uniform input prices is the seminal work of Salinger (1988). Following Matsushima (2006) and Ghosh & Morita (2007), we introduce free entry in the upstream market and we extend their model by assuming differentiated final goods.[5] Consumers' demand for the final good of a downstream firm i is given by the following inverse demand function,

$$p_i = 1 - q_i - \theta \sum_{i \neq j}^{N-1} q_j \tag{4}$$

where p_i is the price of downstream firm i's final good and, q_i, q_j are the final good outputs of downstream firms i and j respectively $(i, j = 1, 2, ...N,\ i \neq j)$. The parameter $\theta \in [0, 1]$ shows the degree of differentiation. In the limit as θ approaches zero, the final goods of downstream rivals become independent, while in the limit as θ approaches one, final goods become perfect substitutes.

Each downstream firm maximizes its profits $\pi_i^D = (p_i - w)q_i, i = 1, 2, ...N$. Using the first order conditions we obtain the following symmetric quantities and final good price as a function of the input price:

$$q = (p - w) = \frac{1 - w}{2 + \theta(N - 1)}, \quad p = \frac{1 + w(1 + \theta(N - 1))}{2 + \theta(N - 1)} \tag{5}$$

Note from (5) that $\partial p / \partial w < 1$, i.e., the pass-through rate which measures the responsiveness of the final goods price to changes in the input price is less than one. The equilibrium output of the downstream firms equals their demand for the input, and since one unit of the input is required for each unit of the final good, we have:

$$X = Q = Nq = \frac{N(1 - w)}{2 + \theta(N - 1)} \tag{6}$$

Solving (6) for w, we obtain the inverse derived demand for the upstream producers' product:

[5] As it will become evident below, our results cannot be present in Matsushima (2006) and Ghosh and Morita (2007) since they assume homogeneous final goods.

$$w = 1 - \frac{2+\theta(N-1)}{N}X \tag{7}$$

Based on this inverse derived demand, each upstream firm maximizes its profits $\pi_i^U = wx_i - f, i = 1, 2, ...M$. Imposing symmetry, we obtain the final equilibrium input quantity and price:

$$x = \frac{N}{(2+\theta(N-1))(M+1)}, \quad w = \frac{1}{M+1} \tag{8}$$

The net profits of each active upstream firm are

$$\pi^U = wx - f = \frac{N}{(2+\theta(N-1))(M+1)^2} - f$$

Free entry in the upstream sector implies $\pi^U = 0$; solving the latter for M we obtain the free entry equilibrium number of upstream firms:

$$M_f = \frac{\sqrt{N}}{\sqrt{f}\sqrt{2+\theta(N-1)}} - 1 \tag{9}$$

where the subscript f is used to denote free entry equilibrium outcomes. We require that at least two firms enter the upstream market, i.e., $M_f \geq 2$, which implies that,

$$f \leq \overline{f} = \frac{N}{9(2+\theta(N-1))} \tag{10}$$

The final free-entry equilibrium outcomes are readily shown to be the following:

$$x_f = \frac{\sqrt{f}\sqrt{N}}{\sqrt{2+\theta(N-1)}}, \quad w_f = \frac{\sqrt{f}\sqrt{2+\theta(N-1)}}{\sqrt{N}} \tag{11}$$

$$q_f = (p_f - w_f) = \frac{1-w_f}{2+\theta(N-1)}, \quad p_f = \frac{1+w_f(1+\theta(N-1))}{2+\theta(N-1)} \tag{12}$$

$$L_f = \frac{(p_f - w_f)}{p_f} = \frac{1-w_f}{1+w_f(1+\theta(N-1))} \tag{13}$$

It is well-known that, in the case without entry, the equilibrium input price does not depend on the number of competing downstream firms or/and the degree of downstream product differentiation (see (8)). However, in the case of upstream entry, the equilibrium input price depends negatively on both N and positively on θ.

Lemma 1 *In a successive Cournot oligopoly model with linear demand and upstream free entry, the equilibrium input price decreases with the number of downstream firms and the degree of product differentiation.*

Proof. From (11), it is easy to verify that $\partial w_f/\partial\theta > 0$ and $\partial w_f/\partial N < 0$. ■

The result that the equilibrium input price depends negatively on the number of downstream firms has already been pointed out by Matsushima (2006) for the case of homogeneous final goods. Proposition 1 extends his finding for the case of differentiated final goods. In addition, Proposition 1 also reveals that the upstream suppliers' market power is enhanced when the downstream market is sufficiently competitive in terms of product differentiation. The average total cost curve and the derived demand for the input must be tangent under a free entry situation. The flatter (steeper) the slope of the derived demand is, the lower (higher) the input price is. From (7), as θ increases, the slope of the derived demand for the input becomes steeper, while as N increases the slope of the derived demand becomes flatter.

Taking the derivative of $(p_f - w_f)$ from (12) with respect to N we obtain the following result.

Proposition 3 *In a successive Cournot oligopoly model with linear demand and upstream free entry, a higher number of downstream firms imply a higher mark-up in the downstream market, if the following conditions hold:* $\theta \leq \theta^* = 2/(1+4N)$ *and* $f \in (\widehat{f}, \overline{f}]$ *with*

$$\widehat{f} = \frac{4N^3\theta^2}{(2+\theta(N-1))(2+\theta(2N-1))^2}$$

Proof. First we show that $\widehat{f} < f \leq \overline{f}$. The second inequality stems from condition (10). From (12), we obtain $\partial(p_f - w_f)/\partial N = \frac{f^2 N}{2(Nf(2+\theta(N-1))^{\frac{5}{2}}}[f(2+\theta(N-1))(2+$

$\theta(2N-1))-2N\theta\sqrt{Nf(2+\theta(N-1)}]$. The sign of the above expression is determined by the sign of the term in brackets, which is positive whenever $\widehat{f} < f$ holds. After some straightforward calculations, it can be shown that $\widehat{f} \leq \overline{f}$ holds when $\theta \leq 2/(1+4N)$. ■

For any given input price, a higher number of downstream firms implies lower final-goods price and thus lower mark-up in the market. However, when there is free entry in the upstream market, an increase in the number of downstream firms attracts more firms on the upstream market, thereby enhancing competition and reducing input prices. When products are sufficiently differentiated (the pass-through rate is low) and fixed costs in the upstream market are moderate (the input-price-reducing effect is relatively strong), the decrease in input price is more pronounced than the decrease in final-goods price implying that market power is enhanced with more downstream firms.

It is clear from the above analysis that, although downstream market power may increase, consumer prices still decrease with the number of downstream firms implying that higher market power does not necessarily imply lower consumer surplus.

Taking the derivative of L_f with respect to N we obtain the following result.

Proposition 4 *In a successive Cournot oligopoly model with linear demand and upstream free entry, a higher number of downstream firms imply a higher mark-up in the downstream market, if the following conditions hold:* $\theta \leq \theta^{**} = 6/(3+4N)$ *and* $f \in (\widetilde{f}, \overline{f}]$ *with*

$$\widetilde{f} = \frac{(2-\theta-2N\theta)^2}{4N\theta^2(2+\theta(N-1))}$$

Proof. First we show that $\widetilde{f} < f \leq \overline{f}$. The second inequality stems from condition (10). From (13), we obtain $\partial L_f/\partial N = \frac{\sqrt{f}\sqrt{2+\theta(N-1)}}{2\sqrt{N}(\sqrt{N}+(1-\theta)\sqrt{f}\sqrt{2+\theta(N-1)}+N\theta\sqrt{f}\sqrt{2+\theta(N-1)})^2}[2-\theta-2N\theta+2\theta\sqrt{f}\sqrt{N}\sqrt{2+\theta(N-1)}]$. The sign of the above expression is determined by the sign of the term in brackets, which is positive whenever $\widetilde{f} < f$ holds. After some straightforward calculations, it can be shown that $\widetilde{f} \leq \overline{f}$ holds when $\theta \leq 6/(3+4N)$. ■

When conditions in Proposition 3 are satisfied then both the downstream mark-up and the Lerner index increase as the number of downstream firms increases; when the mark-up increases, the downstream Lerner index also increases since final-goods price falls. However, the downstream Lerner index may increase as a result of an increase in the number of downstream firms even when the mark-up falls; this can well happen when the decrease in the mark-up is outweighed by the decrease in final-goods price.

Proposition 5 *In a successive Cournot oligopoly model with linear demand and upstream free entry, a higher number of downstream firms imply a lower mark-up and a higher Lerner index in the downstream market, if the following conditions hold: (i)* $\theta \leq \theta^*$ *and* $f \in (\widetilde{f}, \widehat{f}]$*, (ii)* $\theta^* \leq \theta \leq \theta^{**}$ *and* $f \in (\widetilde{f}, \overline{f}]$.

Proof. After some tedious but straightforward calculations the reader can check that $\theta^* \leq \theta^{**}$ and $\widetilde{f} \leq \widehat{f}$. Then, conditions (i) and (ii) immediately follow from Propositions 3 and 4. ■

A commonly held view regarding market power in one-tier industries is that the Lerner index increases with the mark-up charged by the firm. As Motta (2004) quotes, this should be the most desirable feature of any index of market power. However, our analysis in the context of vertically related markets reveals that the equilibrium mark-up and Lerner index in the downstream market may move in opposite directions as a result of an increase in the number of downstream firms. An important implication of this finding is that depending on whether someone based his reasoning on mark-ups or the Lerner index, conclusions regarding the exercise of market power in the downstream market can be markedly different.

3.2 Upstream monopoly and downstream Cournot oligopoly with non-linear demand

This example is taken from Tyagi (1999). An upstream monopolist produces, at zero marginal cost, a homogeneous input which $N \geq 2$ downstream firms use in one-to-one proportion in the production of a homogeneous final good. Downstream marginal production costs are normalized to zero. The upstream supplier uses a linear pricing scheme and downstream firms compete in quantities. The inverse demand for final goods is characterized by a general demand function $p(Q)$.

The following Table 1 is taken from Tyagi's Tables 1 and 3. For our purposes, only the equilibrium values of w and p are reported here. In addition, based on these equilibrium values, we have calculated the equilibrium mark-up and the Lerner index in the downstream market.

For both demand functions depicted in Table 1,[6] as the number of downstream firms rises from 5 to 9, input price, final-goods price and the mark-up charged by each firm rise. When the demand function is of the form $p = 1/(\sqrt{Q} - 1)$, $\sqrt{Q} > 1$, then both the equilibrium mark-up and the Lerner index increase when the number of downstream firms increases. However, when the demand function is of the form $p = 1/(Q^2 - 1)$, $Q^2 > 1$, even though the equilibrium mark-up increases, the Lerner index actually decreases as a result of an increase in the number of downstream firms.

[6] It is easy to verify that both demand functions satisfy log-convexity, i.e., $p(Q)p^{//}(Q) - (p^{/}(Q))^2 > 0$, and thus have pass-through rates larger than one.

Demand function: $p = \frac{1}{Q^2-1}$, for $Q^2 > 1$

downstream firms	5	6	7	8	9
input price w^*	0.21	0.32	0.43	0.55	0.67
final goods price p^*	0.61	0.84	1.08	1.31	1.56
mark-up $(p^* - w^*)$	0.4	0.52	0.65	0.76	0.89
Lerner index $L^* = (p^* - w^*)/p^*$	0.656	0.619	0.602	0.580	0.570

Demand function: $p = \frac{1}{\sqrt{Q}-1}$, for $\sqrt{Q} > 1$

downstream firms	5	6	7	8	9
input price w^*	1.8	2.4	2.9	3.4	3.9
final goods price p^*	3	4.2	5.3	6.3	7.3
mark-up $(p^* - w^*)$	1.2	1.8	2.4	2.9	3.4
Lerner index $L^* = (p^* - w^*)/p^*$	0.4	0.428	0.453	0.460	0.466

Table 1.

4 Conclusions

A well-known result in oligopoly theory regarding one-tier industries is that market power is diminished when more firms are present in the market. In the present paper, we have demonstrated that this standard inverse relationship between market power and the number of firms does not always hold in the context of vertically related markets. In a very general setting, without specific demand functions for final goods and vertical relations between upstream and downstream firms, we derive conditions under which downstream market power, measured by either mark-up or Lerner index, *increases* with the number of downstream firms. Moreover, we have also shown that, in vertically related markets and in contrast to the case of one-tier industries, the equilibrium mark-up and Lerner index in the downstream market can move to opposite directions as a result of an increase in the number of downstream firms. In particular, under certain conditions, the downstream equilibrium mark-up may decrease (increase) and the downstream Lerner index may increase (decrease) with the number of downstream firms. An important implication of this finding is that depending on whether someone based his reasoning on mark-ups or the Lerner index, conclusions regarding the exercise of market power in the downstream market can be markedly different. We have also provided two specific examples in support of our general findings.

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