Illinois Walls*

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Abstract

In its landmark ruling in *Illinois Brick Co. v. Illinois*, the U.S. Supreme Court restricted the right to sue for private damages from violations of section 4 of the Clayton Act to direct purchasers. Despite the fact that typically antitrust injury is, at least in part, passed on to firms lower in the production chain and ultimately to consumers, *Illinois Brick* has since stood as a binding legal constraint. This paper considers the strategic use that upstream firms can make of *Illinois Brick* to shield themselves from private damages claims. In a repeated game setting, we find that *Illinois Brick* may facilitate upstream firms in engaging tacitly in collusive arrangements with concealed side-payments to discourage their direct purchasers from filing suit. An example is given of such an 'Illinois Wall', in which downstream firms are given part of the upstream cartel profits through a symmetric rationing of their inputs at low prices. Interestingly enough, the Illinois Wall is found to be particularly stable when competition is relatively strong at both the up- and the downstream level.
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1   Introduction

Under section 4 of the Clayton Act, individuals or firms injured in their business or property by companies in breach of the competition law can bring private treble-damages suits to be made whole. Since the production of goods or services often

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involves a number of intermediate firms, any upstream anti-competitive behavior, such as price-fixing, is likely to spill-over into several markets, causing larger and smaller monetary injury in the production chain, before ultimately falling in part on the consumers. The precise breaking-down of such vertically spread antitrust damages is complicated, involving applied general equilibrium analysis and sophisticated econometrics.

Twin Supreme Court decisions, the first in *Hanover Shoe Co. v. United Shoe Machinery Corp.*, the second in *Illinois Brick Co. v. Illinois*, have importantly reduced the complexity of private damages claims, however.[1] In the 1968 *Hanover Shoe* ruling—in which the defendant, United Shoe Machinery Co., which was earlier found to have monopolized the machinery market through long-term leasing contracts, claimed that the plaintiff, Hanover Shoe Co., a direct purchaser, was not injured by these anti-competitive contracts, because it had been able to pass the claimed overcharge on to its customers—the Supreme Court disallowed such as defensive use of pass-on on the argument that failing to prevent it would unduly lengthen and complicate antitrust cases and disperse private incentives to seek antitrust injury recovery. As a result, irrespective of the question to what extent the direct purchaser indeed incurred any damages, by *Hanover Shoe* it is entitled to ask the defendant's overcharge, trebled.

Almost a decade later, in the 1977 *Illinois Brick* decision—in which the state of Illinois claimed in conjunction with several hundred local governmental institutions to have been harmed by a fixing of concrete block prices by the defendant, Illinois Brick Co., which artificially increased the costs of the contractors via which the plaintiffs carried out their construction contracts in a complex vertical chain—the Court set a companion standard by also rejecting any offensive use of the pass-on argument. The plaintiff was denied compensation and the precedent was set that only direct purchasers of firms that have acted anti-competitively can sue for damages.

The prime legal argument for denying indirect purchasers standing to sue in *Illinois Brick* relates to a multiple liability problem cast up by *Hanover Shoe*. Since the direct purchaser is entitled to the full overcharge by the latter standard, allowing indirect purchasers to sue for further money as well would effectively multiply the total liability of the defendant far over the three times total damages that are specified in the Clayton Act as the appropriate remedy. *Illinois Brick* thus repairs the liability problem *Hanover Shoe* created—albeit at the expense of potentially permitting the wrong people to seek damages.[2]

Several scholars have further defended the *Hanover Shoe-Illinois Brick* pair of rulings on economic grounds. In Landes and Posner (1979) the view is taken that the intent of Congress to allow for private damages claims in passing the Clayton

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[1]   *Cf.* 392 U.S. 481 (1968) and 431 U.S. 720 (1977), respectively.

[2]   A third related Supreme Court ruling in *California v. ARC America Corp.*, 490 U.S. 93 (1989), legitimized indirect purchaser suits, to the discretion of the individual states. As a result the practice various from state to state, *cf.* Page (1999).

Act was first and foremost to provide for an extra trust-deterrence by creating a private channel of policing, alongside public enforcement. Therefore, efficiency, rather than fairness of compensation, is the appropriate criterion to judge *Illinois Brick* by. Since direct purchasers typically have superior information on the effects of any anti-competitive acts of their suppliers, putting all monetary incentives with them is likely to reduce transaction costs compared to a situation with many fragmented indirect cases. Also, any costs involved in coordinating class action suits of various firms and individuals damaged indirectly—and therefore each possibly only a little—are reduced with enforcement placed in a single hand. Moreover, the determination of all pass-ons of artificial cost increases would require courts to perform multiple, long and complicated analyses involving a large number of interested parties that would be prohibitively costly. All these efficiency arguments have been disputed—in fact, in *Illinois Brick* three Supreme Court judges originally dissented—and in both the House of Representatives and the Senate, bills were proposed—but never enacted— to overrule them.[3] Nevertheless, *Hanover Shoe* and *Illinois Brick* stand today as binding legal constraints.[4]

Despite its potential to reduce process costs and increase private incentives to bring anticompetitive practices to light, however, there is a detrimental effect *Illinois Brick* may have, that should be noted as well. By effectively shielding antitrust violators from all private parties but those directly involved, namely, *Illinois Brick* may potentially give upstream firms a safe-haven to engage tacitly in collusive arrangements, as long as they can discourage their direct purchasers—and them only—from filing suit. Thus allowing potential violators of competition law to focus discouragement efforts on the sole party with standing to sue may neutralize part of the enhanced private incentive effect *Illinois Brick* is thought to have.

Suggestions to this effect have been made in passing in the literature, yet seem never to have inspired a thorough analysis. Harris and Sullivan (1979), for example, in closing of a lengthy exposition on determining pass-ons, only briefly note that:

> "There are situations in which granting the cause of action solely to direct purchasers effectively forecloses any private suits. Often, direct purchasers pass on all or substantially all of the overcharge. (...) If the ongoing relationship between the direct purchaser and the potential defendant has any value to the direct purchaser (and it often will have), the direct purchaser will to that extent be deterred from suing." (*op.cit.*, pp. 351-2)

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[3]   *Cf.* bills S.1874 by Senator Edward Kennedy and others, and H.R. 8359 by Representative Peter Rodino and others (later modified as H.R. 11942), respectively. For some early debate on the multiple liability problem under *Hanover Shoe* without *Illinois Brick,* see LaRue and Newton (1978) and Sneeden (1979). In Harris and Sullivan (1979)—on which we draw below—the force of the complexity argument of passing-on calculations is questioned.

[4]   Recently, for example, Microsoft escaped private damages by appealing successfully to *Illinois Brick* in *Davidson v. Microsoft Corp.* Md. Ct. Spec. App., No. 60, 2/28/02—*cf.* "Indirect Purchasers Barred From Bringing Claim Against Microsoft Under State Statute," *Electronic Commerce & Law Report*, Volume 7, Number 11 of Wednesday, March 13, 2002.

After that, they are quick to say, however, that judicial experience shows that direct purchasers nevertheless do bring cases.[5]

Interestingly enough, however, several empirical analyses into the effects of the two Supreme Court rulings on the number of private antitrust cases quite consistently find an increase in total cases after *Hanover Shoe* in 1968, yet a decrease after *Illinois Brick* in 1977. Directly after *Illinois Brick*, Landes and Posner (1979) reports a structural reduction from 1977 to 1978 in the total number of private cases brought in several districts—from Southern California to Northern Illinois. The authors hesitated to attribute these effects to *Illinois Brick*, however. Instead, they conjectured that the fall in cases reflected an overall downward trend in public enforcement from 1977 to 1978, on the argument that private claims often follow up on public findings.[6] Yet, later studies, involving more post-ruling data, in Snyder (1986) and Joyce and McGuckin (1986), again found decreases in the number of private cases after *Illinois Brick*, suggesting a permanent negative effect. Still, however, this time under reference to the fact that the decrease in the number of private cases found was judged to be only small and statistically insignificant, the authors were not willing to conclude that the effects were due to the Supreme Court constraints to private litigation—at best, the net effect of *Illinois Brick* was judged to be "neutral".[7] Now, if indeed the total effect with both rulings in place has only been modestly negative, then still the data lend themselves to the interpretation that *Illinois Brick* more than reversed the significant increase in private cases seen after *Hanover Shoe*—and before *Illinios Brick*.[8]

One reason perhaps for why the idea that *Illinois Brick* can stabilize non-competitive relationships was so easily discarded, despite some empirical evidence for it, may have been that the long-run relationships that direct purchasers were supposed not to be willing to put in jeopardy by filing suit were understood with no particularly active involvement of the suppliers. Harris and Sullivan (1979) refer to them as issues of "continuity and goodwill." Likewise, Snyder (1986) acknowledges the effect—which he understands as direct purchasers fearing "retaliation" by the suppliers on which they depend—yet down-plays it in a footnote by saying that although such

> "..retaliation ... cannot be dismissed, its practical significance is open to question." (*op.cit.*, p.470).

Certainly, there are lock-in situations, for example, in which switching from one supplier to another involves some costs for the purchaser. The relationship with a

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[5] Similar concern was forwarded by the proponents of bills S.1874 and H.R.8359. *Cf.* Sneeden (1979), p.219

[6] *Op.cit.*, pp.632-4.

[7] Snyder (1986), p.482; Joyce and McGuckin (1986), p.239.

[8] Applying various estimation methods to 1963-1982 data, Snyder (1986) found a positive coefficient relating the number of private cases filed to *Hanover Shoe*, yet a negative coefficient relating them to *Illinois Brick*. These are 11.73 and -15.11, respectively, for example, for the ordinary least squares method. *Cf. op.cit.*, p.479, table 4.

software company responsible for a company's main management information systems, for example, or that with the accounting office of choice is of this nature. Filing against such vital suppliers would most definitely put stress on the service relationship, probably leading to a discontinuation—rather cases of embroilment than retaliation, but nevertheless. However, it is quite questionable indeed, as Snyder (1986) argues, that the costs involved in overcoming these relatively minor exogenous market imperfections are sufficiently high to expect them to keep direct purchasers from exercising their right to obtain treble overcharges—typically a lot of money.

A much more serious type of money foregone when downstream firms file complaint is benefits forwarded by the suppliers to the direct purchasers in an attempt to keep the latter from exercising their right to recover private damages. That is, side-payments from the upstream industry behaving anticompetitively to the downstream purchasers, in exchange for not filing suit. It is in this context also that one can truly speak of retaliation, in the sense that the side-payments are withdrawn upon private claims, since these would lead to the breakdown of the upstream collusive arrangement—the source of the money. This kind of long-term relationship is all the more interesting, not only because it is likely to provide a substantially larger incentive for the direct purchasers, but also because it is costly to the suppliers to maintain. A question of some interest to ask, therefore, is whether such upstream-downstream collusive agreements are tacitly sustainable, and what role *Illinois Brick* has in setting them up.

In this paper, we consider circumstances under which firms may put up such an 'Illinois Wall' to protect themselves from private damages claims. In a simple vertical chain, there are an upstream industry and a direct purchaser downstream industry, the latter selling directly to the consumers. Both industries are characterized by a variable number of firms in Cournot competition. Up- and downstream firms have repeated interaction over an infinite period of time, which captures the long-term nature of their trade relationship. The upstream industry seeks to collude and fix prices. Using *Illinois Brick,* it can concentrate its efforts to keep its customers from filing a treble damages claim solely on the downstream firms. With them, it needs to work out an attractive compensation scheme, that is covert, to avoid antitrust suits brought by the consumers—the direct purchasers of the downstream firms—or the people. This, the two industries manage to do via a rationing scheme. By symmetrically selling to each of the downstream firms only a limited amount of inputs, the cartel creates a scarcity on the market for final consumer products that is beneficial to the downstream firms, yet creates a consumer detriment. This tacit understanding between the industries escapes prosecution.

The potential perverse effect of *Illinois Brick* here reported on is just one aspect of a much more general treatment of incentives effects from private damages claims and their contribution to efficiency in Salop and White (1986), Baker (1988) and Besanko and Spulber (1990). The seminal Salop and White (1986) is an extensive survey of the aspects and empirics of private antitrust enforcement—in which *Illinois Brick* is only

briefly mentioned as a desirable "trimming of the plaintiffs' powers and strengthening the defendants' powers" (*op.cit.*, p.1039). The latter two articles essentially extend on the position of Landes and Posner (1979) that private antitrust enforcement provides a more direct, and therefore better informed channel, thus enhancing legal efficiency. Both papers focus on asymmetric information, arguing that in the presence thereof, private claims increase efficiency and should therefore be encouraged. No discussion of the actual private parties bringing a claim—direct rather than indirect purchasers—is offered, however, for the issue is outside the scope of that literature.

This paper is organized as follows. In the next section, industry relations are modelled in an infinitely repeated game setting, in which the competitive benchmark situation is analyzed. Section 3 considers upstream collusion. It is first established that treble damages without compensation for the downstream industry will certainly lead to private claims. Subsequently, the total of profits that the up- and the downstream industry have between them is shown to increase as a result of the upstream collusion, so that there is the potential for side-payments. Total welfare, however, is seen to decrease in the upstream price level, so that consumers, were they given the right to sue for damages, would be likely to exercise it. In Section 4, a trigger strategy that forms an Illinois Wall is set out and analyzed. It is shown that, when downstream firms are sufficiently patient, Illinois Walls can shield upstream collusion from downstream claims. Moreover, the more competitive both the up- and the downstream sector are, the more stable an Illinois Wall may be erected. Section 5 provides some concluding remarks, claiming a wider applicability of our qualitative findings than just to the present simple exposition.

2 Upstream-Downstream Competition

Consider a market in which $m \geq 2$ identical upstream firms, indexed $j = 1, 2, \ldots, m$, produce a certain good, used as an input in the downstream industry, against normalized constant marginal cost $c = 0$ and no fixed costs. The sole purchasers of this input are $n \geq 1$ downstream firm, indexed $i = 1, 2, \ldots, n$, that each buy the input from the upstream firms at a price p per unit, use it in a linear relation in their production process to obtain their final commodity, which they subsequently sell to their consumers. There are no alternative ways of obtaining the input, nor can the downstream firms substitute away from it. For simplicity, assume that downstream production involves no costs but those of the single input.

Consumer demand for the final commodity is given by the (normalized) linear inverse demand function

$$P(Q_d) = 1 - Q_d, \tag{1}$$

where $Q_d = \sum_{i=1}^{n} q_{i,d}$ is the sum of quantities $q_{i,d}$ produced by downstream firm i.

The market exists indefinitely, without exit or entry changing its supply structure, nor demographic or other changes shifting demand. As a result, the up- and

downstream firms are engaged in a long-term relationship. In their planning, they all take an infinite time horizon as basis, in which they discount future profits at a rate $\delta \in [0, 1)$. As a result, the interplay between the firms can be understood as Cournot competition in a repeated game framework. When both industries act non-cooperatively, the one-shot Cournot equilibrium is played in each period. Since the upstream firms control the inputs for the downstream industry, this is a sequential game, of which the subgame perfect equilibrium is found by backward induction.

Given the input price p, the downstream firms engage in quantity competition and each downstream firm i faces the optimization problem

$$\max_{q_i} \left(1 - Q_d - p\right) q_{i,d}.$$

As a result, downstream individual supply in the symmetric Cournot equilibrium is $q_{i,d}(p) = \frac{1-p}{n+1}$ and market supply

$$Q_d(p) = \frac{n}{n+1}(1-p). \tag{2}$$

The upstream industry exploits this best reply behavior of the downstream firms, so that upstream (inverse) demand is given by the inverse of total downstream sales as a function of p. That is,

$$p(Q_u) = 1 - \frac{n+1}{n}Q_u, \tag{3}$$

where $Q_u = \sum_{j=1}^{m} q_{j,u}$, since there are m upstream firms j. This upstream demand yields an individual upstream profit

$$\pi_u^c = p(Q_u) q_{j,u} = \left(1 - \frac{n+1}{n}Q_u\right) q_{j,u},$$

which each upstream firm maximizes with respect to $q_{j,u}$.

With both the upstream and the downstream industry thus in Cournot competition, the equilibrium outcome is

$$Q_u^c = Q_d^c = \frac{m}{m+1}\frac{n}{n+1}, \; p^c = \frac{1}{m+1} \text{ and } P^c = \frac{m+n+1}{(m+1)(n+1)}, \tag{4}$$

where the superscripts c refer to 'competition'—to be set against anticompetitive behavior below. Individual competitive profits materialize as

$$\pi_u^c = \frac{1}{(m+1)^2}\frac{n}{n+1} \text{ and } \pi_d^c = \left(\frac{m}{m+1}\frac{1}{n+1}\right)^2, \tag{5}$$

in the up- and downstream industry, respectively.

Notice that when the number of upstream firms m becomes very large, the input price p will approach marginal costs and individual profits of the upstream firms will go to zero. The same is true for the market price P and profits for the downstream firms when n goes to infinity. The present setup—albeit simple—thus captures all possible vertical combinations of market forms between the extremes of perfect competition and monopoly.

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3 Upstream Collusion

The upstream industry entertains the idea to conspire in collusion and fix the input prices charged to the downstream firms. Suppose it is able to do so.[9] The industry will then act as a monopolist on its (inverse) demand function (3) and produce

$$Q_u^a = \frac{1}{2} \frac{n}{n+1},$$

which it will sell at a price $p^a = \frac{1}{2}$—the superscript a refers to the fact that the upstream firms now engage in 'anti-competitive behavior'. Cartellization is obviously profitable for the upstream industry, since aggregate cartel profits are

$$m\pi_u^a = \frac{1}{4} \frac{n}{n+1} > \frac{m}{(m+1)^2} \frac{n}{n+1} = m\pi_u^c,$$

where strict inequality follows from the fact that $m \geq 2$.

The downstream industry is injured by the upstream collusion, for it sees its input prices increase. Suppose—in line with the literature attributing efficiency gains to *Illinois Brick*—that it is common knowledge in the industry that the downstream firms, as they deal directly with the upstream industry, know all about the upstream cartel. Since the upstream cartel clearly is in breach of competition law, the downstream firms, therefore, each have the option to bring a private antitrust injury case, claiming treble the upstream overcharge under reference to *Hanover Shoe* and *Illinois Brick*.

Industry wide, the total overcharge suffered by the downstream firms, D, is computed as the difference between the anticompetitively raised price of the downstream inputs and the input price that would have prevailed without the anticompetitive acts—sometimes referred to as the 'but for' price—multiplied by the quantity used in the downstream industry under the actual regime. Hence,

$$D \equiv (p^a - p^c) Q_u^a = \frac{1}{4} \frac{m-1}{m+1} \frac{n}{n+1},$$

in the present setting.[10]

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[9] In the following, issues of horizontal cartel stability are ignored, to focus on the stability of vertical collusive arrangements instead. Since, as will follow below, vertical collusion with side-payments under *Illinois Brick* increases profits for the upstream firms, horizontal stability at that level can be guaranteed under reference to the traditional cartel stability arguments—*cf.* Carlton and Perloff (2000), Chapter 5. By construction, the collusive arrangement set out below will be robust to individual defection at the downstream level. Some further remarks on horizontal stability are made in the concluding section.

[10] Again, a precise determination of damages, or to whom they should accrue, is typically not the prime objective of the courts. Argumentation using the elasticity of demand to show that the overcharge underestimates the lost profits downstream, for it ignores profits that would have been made on the greater volume, is usually not entered, or only mentioned in passing by the plaintiffs to show their damage estimates are conservative—*cf.* Royall (1997). For a comprehensive treatment of damages calculations, see O'Brien (1998).

Suppose that if a suit indeed is brought, there will be no difficulty in substantiating the claim so that it will lead with certainty to a granting of treble damages. Furthermore, let there be no legal costs involved. We consider the case in which the downstream firms bring a class action suit, assumed to be coordinated at no costs either.[11] Finally, we take the threat of public cases to be remote and therefore ignore it. Let $\mu \geq 1$ be a parameter for the strength of the damage claim, with $\mu = 3$ corresponding to treble damages—this minor generalization allows for tracing the effect of trebling. Then, the payoff of the upstream cartel when the downstream industry files suit is,

$$m\pi_u^a - \mu D \leq m\pi_u^c,$$

in the present setup, even when only part of the damages are in fact rewarded.[12]

Hence, even the modest threat of damages claim suffices to make the cartel unattractive, and discipline the upstream industry to behave competitively instead.[13] In fact, even when the downstream firms are able to pass-on the larger part, or all of the overcharges of the upstream cartel, direct purchasers would still be ready to file suit, since *Hanover Shoe* allows for claiming a large amount of damages money, irrespective of the actual injury.

As it is quite attractive for downstream firms to seek injury compensation, therefore, any upstream collusion can only be sustained if the downstream industry can be kept from claiming damages. For that to be at all possible, the cartellization upstream needs to create a surplus over up- and downstream competition, that can subsequently be divided in the chain. Interestingly enough, such extra total profit is available, provided that the total number of firms involved up- and downstream is sufficiently large. This is made more precise in the following result.

Lemma 1 *If n and m satisfy*

$$n > \frac{m+1}{m-1},$$

it is possible for the upstream firms to raise the sum total of up- and downstream profits by raising the input price above its competitive level p^c.

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[11]   All these simplifying assumptions are only for expositional ease and will be relaxed in the concluding section. Note that each downstream firm may alternatively bring an individual private case for three times $\frac{1}{n}$ of total damages. In the absence of transaction costs, here assumed, this is equivalent to the present setup. Hence, filing suit is individually rational in all that follows.

[12]   The critical value of μ that deters cartellization with private damages claims in our linear example is easily found to be equal to $\mu = \frac{m-1}{m+1}$, which is smaller than unity for all finite values of m.

[13]   Note that the trebling of damages is surprisingly well chosen in the present setup, since $m\pi_u^a - \mu D \leq 0$ for $\mu \geq \frac{m+1}{m-1}$, which decreases from three to one when m increases from two. Hence, treble damages will always lead to a loss for the upstream industry in case the downstream industry sues, and, moreover, for the special case $m = 2$, treble damages make the cartel profits vanish exactly.

Proof. From equations (1) and (2) it follows that the consumer price is given by $P(p) = \frac{1}{n+1} + \frac{n}{n+1}p$ and each downstream firm has profits equal to $\pi_d(p) = \left(\frac{1-p}{n+1}\right)^2$. Thus, for a given p, the total profits of the downstream firms (which remain in Cournot competition) are $n\pi_d(p) = n\left(\frac{1-p}{n+1}\right)^2$. Total profits for the upstream cartel are $m\pi_u(p) = pQ_d(p) = \frac{n}{n+1}p(1-p)$. Total profits in the chain as a function of p, $\Pi^a(p)$, then are

$$\Pi^a(p) = m\pi_u(p) + n\pi_d(p) = \frac{n}{n+1}p(1-p) + n\left(\frac{1-p}{n+1}\right)^2, \tag{6}$$

which is maximized at $p^* = \frac{1}{2}\frac{n-1}{n}$. Hence, maximum total chain profits are $\Pi^a(p^*) = \frac{1}{4}$.

Total profits of downstream and upstream firms under upstream Cournot competition is

$$\Pi^c = m\pi_u^c + n\pi_d^c = \frac{m}{(m+1)^2}\frac{n}{n+1} + n\left(\frac{m}{m+1}\frac{1}{n+1}\right)^2 = \frac{nm(m+n+1)}{(m+1)^2(n+1)^2}.$$

so that we have

$$\Pi^a(p) - \Pi^c = \frac{1}{4} - \frac{nm(m+n+1)}{(m+1)^2(n+1)^2} = \frac{1}{4}\left(\frac{m-1}{m+1}\right)^2\frac{\left(n - \frac{m+1}{m-1}\right)^2}{(n+1)^2} > 0.$$

Note that $\Pi^a(p) > \Pi^c$ whenever

$$n \neq \frac{m+1}{m-1}.$$

Moreover, since we only want to allow for a price increase, we should have $p^* = \frac{1}{2}\frac{n-1}{n} > p^c = \frac{1}{m+1}$, which is equivalent to $n > \frac{m+1}{m-1}$. ∎

The necessary scope for a tacit collusion arrangement exists, therefore, as long as the number of firms involved is large enough—and provided that the up- and downstream firms are able to coordinate on a compensation scheme. For a small number of firms, there is no mutual gain in upstream collusion. In particular, there will be no increase in total profits possible when $n = 1$, that is, when the downstream market is served by a monopolist. Total up- and downstream profits from cartel formation do not increase either when $(n, m) \in \{(2, 2), (2, 3), (3, 2)\}$. For all other combinations of industry market structures, there is a surplus from upstream collusion between the two industries.

The potential to compensate downstream firms is one element necessary for sustaining a production cartel. However, *Illinois Brick* only comes into play to facilitate any such arrangement when it is not possible to also compensate consumers. That is, when the vertical agreement does indeed result in consumer detriment. After

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all, the prime effect of *Illinois Brick* is that the upstream industry can focus its side-payments efforts on the direct purchasers. With *Illinois Brick* overturned, the upstream collusive arrangement would quickly come under pressure if consumers have an unambiguous incentive to sue for their damages. Only when indeed acting as a shield against claims that would have been made by others than the direct purchasers, if only these were given the right to do so, is *Illinois Brick* instrumental in the potential anticompetitive effects here identified. The following result on the total surplus in this market shows that upstream cartellization, while increasing the combined profits of the producers, indeed decreases consumer welfare more than proportionally. Hence, total welfare is lower when the upstream industry colludes, relative to when it remains in Cournot competition, so that no compensation scheme exists that can make everyone better off with upstream collusion.[14]

Lemma 2 *Total welfare, defined as total profits plus consumer surplus, falls when the upstream cartel input price is raised above its competitive level p^c.*

Proof. First, using (2), consumer surplus as a function of p can be determined as
$$CS(p) = \frac{1}{2}(1 - P(p)) Q_d(p) = \frac{1}{2}\left(\frac{n}{n+1}\right)^2 (1-p)^2.$$
Total welfare then is defined as
$$W(p) = CS(p) + \Pi(p) = \frac{1}{2}\frac{n}{(n+1)^2}(1-p)(n+2+np),$$
where $\Pi(p)$ is taken from (6). Since
$$\frac{\partial W(p)}{\partial p} = -\frac{n(1+np)}{(n+1)^2} < 0,$$
an increase in the price reduces welfare. ∎

4 An Illinois Wall

Everything is in place now to provide an example of an Illinois Wall. The key to erecting one is for the upstream cartel to compensate the downstream firms for their actual injury plus the amount of treble overcharge they are entitled to irrespectively by *Hanover Shoe*. There are several ways in which the upstream firms can indeed pass

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[14] Note, therefore, that our findings are different from the well-know result that vertical integration of up- and downstream monopolies is socially efficient when it eliminates the double monopoly markup—*cf.* Carlton and Perloff (2000), pp.398-401. Here, the up- and downstream industries do not integrate. They only coordinate via side-payments. It is for this reason that the profit increase between the industries here goes at the expense of the consumers.

on some of their cartel profits to compensate their direct purchasers, ranging from overt money transfers to jaunts to the Bahamas. Any scheme that can complement *Illinois Brick* has to satisfy some constraints, however. It should, of course, be sufficiently interesting for the downstream firms not to free ride on it—benefitting from it first, and then filing suit after all. More importantly, it better be covert, as any evidence of collusive arrangements explicitly involving the downstream firms opens up the possibility for consumers claiming for treble damages, they now being the direct purchasers of wrong-doers. Preferably, therefore, it is tacit in that all parties involved understand its value with little or no communication necessary.

One possible compensation scheme that satisfies these constraints amounts to a restriction on the number of inputs the upstream firms sells to the downstream firms. This creates an artificial scarcity on the downstream market, from which the downstream firms profit. This so-called 'putting the downstream firms on allocation' is illustrated in the figure below.
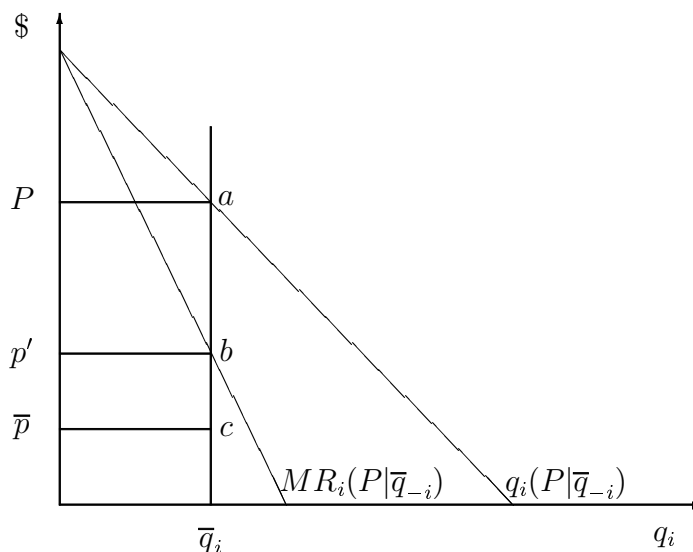

Figure 1: An individual downstream Cournot competitor put on rationing.

The figure displays the individual situation of a downstream firm, which is horizontally in Cournot competition. The upstream cartel supplies it with a restricted quantity of inputs, $\overline{q}_i$, only, at price $\overline{p}$. In the knowledge that all other downstream firms have been allotted the same number of inputs, so that its residual demand function is $q_i\left(P|\overline{q}_{-i}\right)$, the downstream firm can safely produce its final product—involving no further costs—which, given the linear production technology are $\overline{q}_i$ units, at price P. The profits in this are represented by area $Pac\overline{p}$.

Given residual demand, the input price that would have corresponded to this

sales price of P, if it were not for the upstream cartel, is p', with an associated profit of $Pabp'$. Hence, the quantity-constraint-low-input-price combination increases the profits of the downstream firm by an amount represented by $p'bc\bar{p}$. This extra profit can be understood as compensation for the downstream producer awarded by the upstream firms. If the direct purchasers do understand the rationing at low prices that way, the arrangement can act to silence the sole party with power to speak up. No money passes hands, the deal is covert and tacit, and even escapes outside prosecution, as firms can hardly be made to buy more inputs than they want to.

Hence, under this voluntary rationing scheme, the upstream industry delivers its side-payments to the downstream firms by choosing a reduced price-quantity combination $\left(\bar{p}, \overline{Q}\right)$ so as to maximize

$$m\pi_u^{c,r} = \bar{p}\overline{Q},$$

where $\overline{Q} = \sum_{i=1}^n \bar{q}_i$—note that in the symmetric equilibrium $\bar{q}_i$ is the same for all firms, so that all are compensated by an equal amount. By *Illinois Brick* the upstream industry needs to do so only under the restriction that the downstream industry has no incentive to bring a private damages claim. That is, the upstream industry can play a trigger strategy in which the upstream cartel rations at a low price, only as long as the downstream industry does not sue. If the downstream industry does decide to claim treble damages, the upstream cartel breaks down and the upstream industry reverts to Cournot competition from then on.

Faced with this upstream trigger strategy, total profits of the downstream industry when refraining from suing and accepting the side-payments instead are

$$\sum_{t=0}^{\infty} \delta^t \left(1 - \overline{Q} - \bar{p}\right) \overline{Q}.$$

If the downstream industry does bring a private treble damages suit, it receives the lucrative profit for the period in which it defects from the tacit arrangement, plus treble damages in that period. Then the arrangement breaks down and the downstream industry will receive the normal competitive Cournot profits for the rest of the time. Hence, total discounted pay-off from suing is

$$\left(1 - \overline{Q} - \bar{p}\right) \overline{Q} + \mu D + \sum_{t=1}^{\infty} \delta^t n\pi_d^c.$$

Notice that the downstream industry still reaps the benefits of the price discount in the current period.

Rewriting these costs and benefits of filing suit and comparing them, the downstream industry will refrain from exercising its right to claim antitrust injury if

$$\frac{\delta}{1-\delta} \left(1 - \overline{Q} - \bar{p}\right) \overline{Q} \geq \mu \left(\bar{p} - p^c\right) \overline{Q} + \frac{\delta}{1-\delta} n\pi_d^c. \tag{7}$$

This key condition is quite intuitive: the present discounted value of the downstream future payoffs under the rationing upstream cartel regime, should be larger than the present damages claim plus the discounted value of profits under up- and downstream Cournot competition. Furthermore, notice that if δ is close enough to unity, so that the treble damages amount is relatively unimportant, the core of the condition reduces to

$$\left(1 - \overline{Q} - \overline{p}\right)\overline{Q} \geq n\pi_d^c,$$

which says that the per period downstream profits increased by rationing under upstream collusion should exceed the per-period industry profits under competition. This allows for our result.

Theorem 3 *If $\delta > \delta^*$, with*

$$\delta^* = \frac{\mu(n+1)}{(n-1)m + (\mu-1)(n+1)}, \tag{8}$$

Illinois Brick sustains the upstream cartel. That is, there exist $\overline{p}^*$, $\overline{Q}^*$ such that $m\pi_u^{a,r} = \overline{p}^*\overline{Q}^* > m\pi_u^c$ is maximized and the downstream industry has no incentive to exercise its unique right to sue for treble antitrust damages.

Proof. First note that the upstream cartel will always choose $\left(\overline{p}, \overline{Q}\right)$ such that (7) holds with equality. Then solving (7) for $\overline{p}$ gives

$$\overline{p} = \frac{1}{\mu - (\mu-1)\delta}\left(\delta\left(1 - \overline{Q}\right) + \mu(1-\delta)p^c - \delta\frac{n\pi_d^c}{\overline{Q}}\right).$$

Substituting this into the profit function yields

$$m\pi_u^{a,r} = \frac{1}{\mu - (\mu-1)\delta}\left(\delta\left(1 - \overline{Q}\right) + \mu(1-\delta)p^c\right)\overline{Q} - \frac{\delta}{\mu - (\mu-1)\delta}n\pi_d^c.$$

This function is concave in $\overline{Q}$ and maximized at

$$\overline{Q}^* = \frac{1}{2} + \frac{1}{2}\mu\left(\frac{1-\delta}{\delta}\right)p^c.$$

Given this value of $\overline{Q}^*$, we readily find

$$\overline{p}^* = \frac{1}{\mu - (\mu-1)\delta}\left(\frac{1}{2}\delta + \frac{1}{2}\mu(1-\delta)p^c - \delta\frac{2n\pi_d^c}{1 + \mu\left(\frac{1-\delta}{\delta}\right)p^c}\right), \text{ and}$$

$$m\pi_u^{a,r*} = \frac{\delta}{\mu - (\mu-1)\delta}\left(\left(\frac{1}{2} + \frac{1}{2}\mu\left(\frac{1-\delta}{\delta}\right)p^c\right)^2 - n\pi_d^c\right).$$

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Notice that we need $\overline{p}^* > p^c$. It can easily be shown that this is so for δ close to unity. Moreover, there is a unique value of δ in $[0,1)$, given by δ^* defined in (8) in the theorem, for which $\overline{p}^* = p^c$. At this value of δ^*, we have

$$\left.\frac{\partial \overline{p}^*}{\partial \delta}\right|_{\delta = \delta^*} = \frac{1}{2\mu mn} \frac{((n-1)\,m + (\mu - 1)\,(n+1))^2}{(m+1)\,(n+1)} = \frac{\mu}{2mn} \frac{n+1}{m+1} \left(\frac{1}{\delta^*}\right)^2 > 0$$

which proves that only for $\delta > \delta^*$ the rationing price exceeds the Cournot price p^c. ∎

We have thus established that Illinois Walls can exist. Moreover, they may be a concern. Interestingly enough, namely, the aid of *Illinois Brick* to sustain vertical collusion is greater, the more competitive both the up- and the downstream industries appear. To see that, first note that $\delta^* < 1$ if and only if $n > \frac{m+1}{m-1}$, which is the condition found in Lemma 1 to be necessary for potential side-payments. Second, observe that δ^* decreases both in m, the number of upstream firms, and in n, the number of downstream firms. Moreover, $\lim_{m \to \infty} \delta^* = 0$ and

$$\lim_{n \to \infty} \delta^* = \lim_{n \to \infty} \frac{\mu\,(n+1)}{(n-1)\,m + (\mu - 1)\,(n+1)} = \frac{\mu}{m + \mu - 1},$$

which decreases from $\frac{\mu}{\mu+1}$ to zero, as m increases from two.

The reason why Illinois Walls may be more stable, the more competitive the horizontal layers in the production chain is two-fold. Fierce downstream competition allows the downstream firms to pass a larger part of their overcharge on to the consumers. Under *Illinois Brick*, these passed on damages escape claiming, for the consumers have no right to recover them. Consequently, the monetary incentive to sue for private damages is smaller, as a successful claim will recover the damages money, but has little long term benefits as the true injury from upstream collusion felt downstream was only small. At the same time, a larger number of competitors in the upstream industry makes the vertical collusion scheme more attractive to each of them, compared to competition, so that they can forward a larger sum in side-payments to the downstream level. Illinois Walls therefore, it seems, may be found where they are least expected.

Finally, it is worth noting that from the remedy perspective the potential to erect Illinois Walls vanishes only when the impact of the private damages claims is increased to infinity. In the existing literature on incentive effects from private antitrust enforcement, such as Baker (1988), multiple damages are applauded. The point of Besanko and Spulber (1990), for example, is that private antitrust enforcement effectively increases social welfare, yet only for a sufficiently large damage multiple. In the present analysis, for any finite claim—and certainly for the treble damages for which the upperbound to δ^* is $\frac{3}{4}$—there remain reasonable discount factors for which Illinois Walls exist.

5   Concluding Remarks

We have identified a potential anticompetitive effect of the influential twin Supreme Court rulings in *Hanover Shoe* and *Illinois Brick*, so far largely ignored in the literature, despite of some empirical indication of its existence. Several aspects important for understanding the full effect of private damages claims have been set aside above in order to offer an unobstructed view on the strategic role that *Illinois Brick* can play in stabilizing chain collusion. As a result, the setup of our analysis is quite simple. Yet, we believe it captures the nature of the potential anti-competitive effect of *Illinois Brick*. Non-linearity in demand, production technology or cost structures, for example, we expect not to change our qualitative findings—and our example of an Illinois Wall would stand in any event. Also, Illinois Walls can be erected in longer vertical chains. More importantly, our assumption that up- and downstream competition takes the form of Cournot quantity setting—which could be argued introduces an exogenous market imperfection—in fact turns out to hinder us in making our point, rather than help us. To see why, suppose that up- and downstream producers would be in Bertrand competition instead. Then, the upstream collusive arrangement would increase profits far over and above the increase established in the present analysis. Moreover, the downstream industry would, since it would price at marginal costs, be able to pass all of the overcharge on the consumers, thus increasing profits substantially in the compensation offered by the upstream industry to discourage private damages claims. In this, total welfare certainly is reduced. Hence, the misuse of *Illinois Brick* is at least as profitable as it is under Cournot competition—which checks our finding that the more competitive the production chain as a whole, the higher the expected incidence of Illinois Walls.

Although our analysis does feature an asymmetry in information about the upstream collusion between the direct purchasers and the consumers, we have ignored the larger part of the potential for efficiency gain attributed to *Illinois Brick* in the existing literature. That is, we have assumed that there are no court costs, no need for plaintiffs to make costs in presenting evidence, nor for defendants to counter allegations. Also, we do not allow for the probability of losing a case that does in fact have merit, nor do we have costs of coordinating class action suits involving a number of downstream firms that have each suffered smaller antitrust injuries. In all these respects, *Hanover Shoe* and *Illinois Brick* is thought to save on transaction costs. We have abstracted from these aspects to focus on contributing just one argument to the debate, which is that *Illinois Brick* may have anticompetitive effects. Nevertheless, since the increase in total profits between the up- and the downstream industries is substantial, we are confident that even with the introduction of non-negligeable transactions costs, defense strategies using *Illinois Brick* could be profitable, so that our example of an Illinois Wall would still stand.

An issue of some concern is that of the horizontal stability of the upstream cartel arrangement. Although the appeal to traditional arguments—typically building on

the folk theorem—to stabilize the upstream cartel suffices to ignore the matter for our main result, it should be noted that the larger the number of firms in the upstream industry, the more strain will be put on the horizontal collusive arrangement. When the number of upstream cartel members increases, namely, each individual upstream firm has a greater incentive to defect and undercut the cartel price. Hence, the more difficult it becomes to sustain the collusive agreement horizontally. Interestingly enough, therefore, there are two conflicting effects of more competition upstream. On the one hand, more upstream firms widens the space of discount factors for which Illinois Walls exist, while on the other it narrows that for which the upstream industry is able to sustain it amongst themselves. Some further investigation into the window of discount factors that can carry both stability issues is called for. Yet, we are quite confident that it will turn out to be open.

Related to the horizontal stability issue is one of the downstream industry understanding that the upstream industry is indeed handing it down concealed profits via the symmetric rationing scheme at low prices. Apparently, the practice of putting downstream customer on allocation is not uncommon. Cigarette companies in the US used to allocate supplies with a system in which wholesalers were limited to small increases over previous purchases—unless they could show that they had acquired new retail customers. Nevertheless, the tobacco wholesalers sued the manufacturers for price fixing. Clearly the wholesalers had not understood that the vertically installed symmetric rationing scheme may well have been to the benefit of all of them. The more downstream firms are to be involved in the tacit collusion, the more difficult it would probably become to make each of them understand the arrangement. Yet, one would expect the downstream firms to be educated over time in the repeated game. All in all, they each are just another brick in the wall.

On the other hand, a possibility so far not discussed, yet opened up by *Illinois Brick*, is that of upstream firms actively engaging in the installment of a competitive layer of downstream firms to act as a shield against customer claims. The analysis above departed from an exogenously given market structure, in which the upstream cartel engages in a collusive arrangement with the existing downstream purchasers. Yet, a more sophisticated option would be that, as part of its strategic use of *Illinois Brick*, the upstream industry first goes out to establish seemingly independent downstream purchasers through which to trade, where previously it dealt directly with the final customers—or, for that matter, the next level in the vertical chain, when it is longer. Illinois Walls then involve a vertical disintegration with legal corporations, otherwise empty, which would, for one thing, facilitate the vertical understanding of the arrangement. To expect firms to indeed register such fake competitive Bahama's-firms to act as an Illinois Wall may be a little farfetched, perhaps, but nevertheless. *Illinois Brick* could be an argument for not vertically integrating parts of the production chain, where such may be socially desirable.

Finally, an important aspect here neglected is the *parens patriae* provision for consumers and indirect purchasers to file a complaint on the anti-competitive behav-

ior of upstream firms that are out of their reach by *Illinois Brick,* with their state antitrust enforcers or the Department of Justice. Public cases will, no different from private ones, put stress on both the horizontal and the vertical cartel arrangements, thus potentially undermining them. Of importance in this also are leniency programs, which offer protection from remedies to those firms involved in anti-competitive arrangements that report them to the antitrust authorities. Although essential in any full understanding of the complex incentive issues that play in antitrust enforcement, we believe it is justified to leave the threat of public prosecution out of our analysis, for we only intend to contribute a single argument to the debate. Also, the Illinois Wall arrangement we sketch is such that indirect purchasers or consumers will not necessarily need to find out about them, if information is imperfect and asymmetric—as assumed in the prime efficiency argument in support of *Illinois Brick,* discussed in the introduction. Of course, a fair weighing of any of these arguments would require explicit transactions costs, as well the probability of being unsuccessful in court, all absent in our simple analysis and all interesting issues for further research.[15]

In all, it seems that the possible misuse of the twin Supreme Court positions in *Hanover Shoe* and *Illinois Brick* to construct Illinois Walls in vertical production chains merits notification, and cannot be as easily discarded of as the early literature did. Its negative welfare effects need to be taken into consideration and weighted against the efficiency gains of *Illinois Brick* and *Hanover Shoe* that have so far been forwarded. Moreover, field investigations into the defensive use of Illinois Walls seems called for, to see whether indeed the practice of putting direct downstream purchasers on allocation is more frequent in states that follow *Illinois Brick.* Despite of its relevance to many prominent antitrust cases since the late 1970's, and some empirical indication that Illinois Walls may indeed exist, the potential defense strategy that *Illinois Brick* offers upstream firms to ward off private antitrust cases is not sufficiently well understood.

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[15] A related issue, that thus can be ignored to make the present argument, arises from the 1981 Supreme Court decision in *J. Truett Payne Co., Inc. v. Chrysler Motors Corp.* 451 U.S. 557 (1981) that indirect parties can privately ask for injunctions to break up the upstream cartel in state courts.

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