

LICENSING RESTRICTIONS ON FIELDS OF USE VS. ADJACENT MARKETS: A POTENTIAL ECONOMIC BASIS FOR DIFFERENT LEGAL TREATMENT

MARIUS SCHWARTZ*

Thank you for inviting me. It is a pleasure to be here with such distinguished company and a great audience. My remarks reflect very preliminary thoughts, and I welcome your reactions. Since the title of my remarks may not be self evident, let me start with a little motivation.

I.

A MOTIVATING EXAMPLE:

MONSANTO V. DUPONT BIOTECH LITIGATION

The idea for these remarks was triggered by the ongoing litigation between DuPont and Monsanto involving biotech traits in agriculture, specifically for corn and soybean seeds.¹ I am not involved in this litigation and am only peripherally familiar with the issues based on public information, especially DuPont's counterclaims.² I will ignore various issues in the litigation, like the validity of Monsanto's patents. The part that piqued my interest was the dispute about the licensing restrictions.

* Professor of Economics, Georgetown University, Washington, DC 20057-1036; mariusschwartz@me.com. These remarks are based on my comments on the Antitrust and Innovation Panel, New York University School of Law's *Annual Survey of American Law* 2010 Symposium: Critical Directions in Antitrust. In editing those remarks I have tried to preserve their informal tone, while elaborating on some points and adding citations. For helpful discussions I thank Paolo Ramezzana and George Rozanski.

1. At the time these Remarks were published, the Eastern District of Missouri decided the referenced litigation. *See generally* Monsanto v. E.I. Dupont de Nemours & Co., 2010 WL 3039210 (E.D. Mo. July 30, 2010).

2. Defendant's Answer and Counterclaims, Monsanto Co. v. E.I. du Pont de Nemours & Co. (E.D. Mo. June 16, 2009) (No. 4:09-cv-00686), available at http://www2.dupont.com/Media_Center/en_US/assets/downloads/pdf/20090616DuPontCounterclaim.pdf. For additional industry background and a broader discussion of competition issues, see Diana L. Moss, *Transgenic Seed Platforms: Competition Between a Rock and a Hard Place?*, AM. ANTITRUST INST. (Oct. 23, 2009), http://www.antitrustinstitute.org/sites/default/files/AAI_Platforms%20and%20Transgenic%20Seed_102320091053_0.pdf.

The basic facts as I understand them are as follows: DuPont's division Pioneer licenses from Monsanto a trait called Roundup Ready®, which can be put into seeds to make them tolerate the widely used herbicide Roundup®.³ DuPont now wants to “stack,” which means to add its own traits on top of Roundup Ready® to create improved products such as seeds that would have tolerance to other herbicides beyond Roundup or to insects, or have desirable “output features,” like reduced trans fats.

According to DuPont's counterclaim, Monsanto also is planning to develop stacked traits, and Monsanto contends that DuPont's license to use Roundup Ready® does not entitle DuPont to stack other traits with it.⁴ DuPont characterizes this as an attempt by Monsanto to extend its monopoly over Roundup Ready into emerging markets for stacked products—monopoly leverage, with all its negative connotations.⁵ Monsanto might respond, “Now wait a minute. What we are talking about is a field-of-use restriction. We've licensed you for something. We want to keep the new emerging fields for ourselves. The law is generally pretty tolerant of field-of-use restrictions in licensing. So where is the problem?”

This got me thinking about what is meant by a “field of use” versus a “market” because the legal stance seems to differ depending on the characterization.

II. WHY A SEEMINGLY MORE PERMISSIVE LEGAL STANCE TOWARD RESTRAINTS ON FIELDS OF USE THAN ON ADJACENT MARKETS?

I am not a lawyer, so please take the ensuing with a mountain rather than a grain of salt; an economist opining about the law is even more dangerous than the other way around. But my sense from having read a bit in the area is that the law allows an intellectual property (IP) holder with market power—and it's worth reiter-

3. Roundup® is Monsanto's brand of glyphosate, a broad-spectrum herbicide that is now off patent and available in generic versions.

4. In its Press Release of June 17, 2009, DuPont describes Monsanto's lawsuit as “seek[ing] to block innovative new soybean lines from . . . Pioneer Hi-Bred” and asserts that “we believe we have every right through our existing license agreement to ‘stack’ our Optimum GAT trait Pioneer soybeans already containing a Roundup Ready® trait.” Press Release, E.I. DuPont de Nemours & Co., DuPont Asserts Anti-Trust, Patent Claims against Monsanto (June 16, 2009), http://vocuspr.vocus.com/VocusPR30/Newsroom/Query.aspx?SiteName=DupontNew&Entity=PRAsset&SF_PRAsset_PRAssetID_EQ=112532&XSL=PressRelease&Cache=

5. *Id.*

ating that IP by itself need not confer market power—greater discretion (a) to impose field-of-use restrictions in licensing, thereby excluding licensees from certain fields than (b) to deny its IP to rivals that seek to compete with it in complementary markets requiring access to this IP, a scenario often described as monopoly leverage.

Let's start with field-of-use licensing. The Supreme Court, over seventy years ago, confirmed that patent owners are free to “grant licenses . . . limited to use in a defined field.”⁶ It viewed such limits as lawful exploitation of the patent, not an improper extension of the scope of the patent, and subsequent lower court decisions have taken a similarly permissive approach.⁷ The federal antitrust agencies in their IP Licensing Guidelines also view field-of-use limitations as benign, stating that such limitations may increase the licensor's incentive to license by “protecting the licensor from competition in the licensor's own technology in a market niche that it wants to keep to itself.”⁸

Turning to restrictions on adjacent markets, the law apparently is not categorically permissive. If an IP holder limits competitors' access to IP needed to compete in a “related” or “adjacent” or “secondary” market, such conduct may be scrutinized,⁹ often under the guise of tying.¹⁰ For example, if a company like Xerox or Kodak

6. Gen. Talking Pictures Corp. v. W. Elec. Co., 304 U.S. 175, 181 (1938), *aff'd on reh'g*, 305 U.S. 124 (1938). This remains the main Supreme Court decision on field-of-use licensing.

7. See *Monsanto Co. v. Scruggs*, 459 F.3d 1328, 1338 (Fed. Cir. 2006) (finding that field-of-use licensing restrictions “are also within the scope of the patent grant”); ABA SECTION OF ANTITRUST LAW, INTELLECTUAL PROPERTY AND ANTITRUST HANDBOOK 176 (2007); Mark Patterson, *Contractual Expansion of the Scope of Patent Infringement Through Field-of-Use Licensing*, 49 WM. & MARY L. REV. 157, 159 (2007) (noting that licensee may use patented invention only in “specified way”); *id.* at 171 (noting that *Monsanto Co.* eliminated all doubt that field-of-use licensing restrictions “are also within the scope of the patent grant”).

8. U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY, § 2.3 (1995).

9. See ABA SECTION OF ANTITRUST LAW, *supra* note 7, at 11 (noting that unilateral refusal to license “may raise antitrust concerns when the refusal is directed against competition and the purpose is to create, maintain, or enlarge a monopoly”) (quoting *Intergraph Corp. v. Intel Corp.*, 195 F.3d 1346, 1358 (Fed. Circ. 1999)); *id.* at 218–19 (noting that charging discriminatory royalties is not grounds to establish patent misuse or antitrust violation “in the absence of some unique evidence to establish anticompetitive effects, such as limiting competition with an affiliate of the licensor in a downstream market”) (emphasis added).

10. Mark R. Patterson, *When Is Property Intellectual? The Leveraging Problem*, 73 S. CAL. L. REV. 1133, 1137 (2000) (noting that “[t]he Supreme Court has been quite willing to discourage leveraging even when the seller's power is a product of intel-

refuses to supply its patented parts to independent service organizations that might use the parts to compete in servicing the durable good, and if servicing is portrayed as a different market, the conduct may be condemned as leveraging of IP-based market power in parts into the related market.¹¹

In sum, the IP holder apparently has less of a *carte blanche* to restrict licensees' access to its IP when they use it to compete in a related "market" than when they use it to venture outside of a designated "field of use." But what do these labels mean? And are there economic reasons that could rationalize different legal treatment?

My hypothesis—and please tell me if it's wildly off base—is that perhaps these labels correlate in a rough way with different underlying economic conditions, specifically with the magnitude of the tradeoff between (a) total losses to other parties from allowing the IP holder greater discretion to impose licensing restrictions, and (b) the resulting increased profit to the IP holder. That trade off may be worse, on average, when restrictions pertain to adjacent markets than to fields of use. And if that is true, then maybe there is an economic rationale for looking more permissively, from a cost-benefit standpoint, at field-of-use restrictions. Let me flesh this out a bit.

III. THE RELATIVE COST OF PROVIDING INCENTIVES TO INNOVATE

The patent system (a shorthand for intellectual property generally) gives a patent holder certain rights to exclude others from using its invention even though the total harm to other parties will often exceed its increased profit. Such an outcome is accepted, of

lectual property," and adding that in two leading tying cases, *International Salt Co. v. United States*, 332 U.S. 392 (1947) and *United States v. Paramount Pictures*, 334 U.S. 131 (1948), tying products involved patented machines and copyrighted films). IP law has also discouraged leveraging—the early antitrust tying cases relied on earlier patent infringement cases in which the Court found patent misuse. *Id.* at 1137; see also *id.* at 1150 ("[P]atent law offers ample reason to reject the view that the leveraging power of a product embodying an invention is necessarily a product of that invention.").

11. ABA SECTION OF ANTITRUST LAW, *supra* note 7, at 11–12. In *Image Technical Services v. Eastman Kodak Co.*, 125 F.3d 1195, 1219–20 (9th Cir. 1997), the Ninth Circuit upheld as reasonable the District Court's instructions that Kodak's refusal to sell patented parts to ISOs constituted monopoly leverage from parts to servicing. However, in *In re Independent Service Organizations Antitrust Litigation*, 203 F.3d 1322, 1329 (Fed. Cir. 2000), the Federal Circuit held that Xerox's refusal to sell patented parts to ISOs did not violate the antitrust laws.

course, on grounds that the prospect of ex post profit provides incentives to incur the investment needed to bring about inventions in the first place.¹² While the link between ex post profit and the incremental likelihood of innovation is imprecise and can vary across industries, a higher expected profit is widely presumed to encourage innovation.¹³

In assessing a policy that allows greater profit to a patent holder, however, it is also relevant to consider the increase in profit relative to the effect on other parties. Let V denote profit to the patent holder and S denote total surplus (economic benefit) to all other parties. Consider an action by the patent holder reflecting greater discretion that increases its profit by some amount $\Delta V > 0$, but decreases surplus to others by some amount $\Delta S < 0$.¹⁴ The tradeoff ratio $t = \Delta S/\Delta V < 0$ reflects society's cost of providing incentives. The larger this ratio is in absolute value, the greater the loss is to other parties, post innovation, per dollar of additional profit to the patent holder. When the ratio exceeds 1—other parties' losses exceed the patent holder's gain (e.g., because total output falls)—it is common to say there is a loss in total welfare or a deadweight loss.¹⁵

12. Indeed, the argument applies to any form of property, intellectual or other. The need to provide incentives for investment is a powerful reason why U.S. antitrust laws permit a legitimately acquired monopoly and the right to charge a monopoly price.

13. See, e.g., Stuart J.H. Graham & Ted Sichelman, *Why Do Start-Ups Patent?*, 23 BERKELEY TECH L.J. 1063, 1071 (2008) (citing Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, reprinted in THE RATE AND DIRECTION OF INVENTIVE ACTIVITIES: ECONOMIC AND SOCIAL FACTORS 609 (Richard R. Nelson ed., 1962)) (noting that "supernormal profits" are required for innovation).

14. There can be cases where both ΔV and $\Delta S > 0$, for example, if a patent holder's latitude to adopt price discrimination across markets instead of a uniform price leads it to maintain the same price in its initial market but give selective discounts to markets that it would not serve under uniform pricing. Extensions of this scenario are analyzed by David A. Malueg & Marius Schwartz, *Parallel Imports, Demand Dispersion, and International Price Discrimination*, 37 J. INT'L ECON. 167 (1994). The controversial cases, however, involve $\Delta V > 0$ but $\Delta S < 0$, i.e., when increased discretion to the patent holder imposes ex post harm on others.

15. Defining total welfare W as the sum $S + V$ and the welfare tradeoff ratio $t_w = \Delta W/\Delta V$ implies that $t_w = (\Delta S + \Delta V)/\Delta V = t + 1$: the ratio of loss in total welfare per additional dollar profit to the patent holder (t_w) equals the loss to other parties per additional dollar profit (t) plus the number 1, because total welfare includes the patent holder's profit. For example, if $t = -3/2$ then $t_w = -1/2$. The ratio t_w can be interpreted as a "leakage ratio," the proportion of the loss to other parties that was not transferred to the patent holder as increased profit. The common definition of total welfare as $W = S + V$ assigns equal weights to a dollar of profit as to a dollar of benefit to other parties; assigning different weights, however, would not

Example: A patent is vital for producing a certain product. Consumer demand for the product is a linear function of its price. The marginal cost of production is constant and equals c plus the per-unit royalty paid to the patent holder. Compulsory licensing at zero royalty would yield a competitive price downstream equal to c and an output q^c . If the patent holder is allowed to charge the monopoly royalty r^m to all producers, the competitive downstream price rises to $c+r^m$ and output falls to q^m . This output reduction causes the standard monopoly deadweight loss. Given linear demand and constant marginal cost, the tradeoff ratio from charging a monopoly rather than zero royalty is $\Delta S/\Delta V = -1.5/1$ —i.e., consumers' loss from the price increase is fifty percent larger than the patent holder's gain—implying a short-run overall welfare loss of half a dollar per extra dollar of profit.¹⁶

By allowing a patent holder to engage in simple monopoly pricing, IP law and antitrust law both accept a tradeoff ratio larger than one (in absolute value)—some reduction in static, overall welfare—in order to provide incentives to invest in the first place. But granting a patent holder increased discretion becomes less attractive as this tradeoff worsens. Increased discretion then represents a relatively inefficient way of delivering additional profit to the innovator in terms of the costs imposed on other parties.

I used this concept almost twenty years ago in the international trade/IP area to argue that a particular regulation that gave U.S. patent holders stronger protection against infringing imports than against infringing domestic competitors can imply a substantially worse tradeoff than would occur under symmetric protection against all infringers.¹⁷ Recently I learned from Suzanne Scotchmer's book that others have used the concept earlier, including Louis Kaplow in his celebrated 1984 article.¹⁸ So I claim no novelty, but certainly good company.

alter the basic point that the welfare tradeoff from allowing increased discretion to the patent holder is worse the larger in absolute value is $\Delta S/\Delta V$.

16. The patent holder's profit rises from zero to $r^m q^m$, geometrically by a rectangle. Consumer surplus falls by the sum of two areas: (i) the same rectangle, reflecting the price increase for the output still being consumed, q^m , plus (ii) the triangle corresponding to the area under the demand curve and above the old price, between the old and new quantities q^c and q^m , representing the loss of consumer surplus due to the output reduction. Under the assumptions in the text, the area of the triangle is one half that of the rectangle.

17. See generally Marius Schwartz, *Patent Protection through Discriminatory Exclusion of Imports*, 6 REV. INDUS. ORG. 231 (1991).

18. SUZANNE SCOTCHMER, INNOVATION AND INCENTIVES 109–12, 113–20 (2004). Scotchmer attributes the "ratio test" to Pankaj Tandon, *Optimal Patents with*

Let's briefly discuss some factors that plausibly might worsen this welfare tradeoff, and then link the discussion to our licensing context.

IV. CONDITIONS THAT PLAUSIBLY MIGHT WORSEN THE TRADEOFF

Start with the following hypothetical benchmark case. The IP is vital for producing a homogeneous downstream good whose demand and cost conditions are given and commonly known. Suppose further that the IP holder wants to prevent competition downstream, for example, in order to facilitate price discrimination among users of the good. The IP holder could profitably bring about a downstream monopoly without sacrificing cost efficiency. If some other firms would be better than it at producing the good, it could select the lowest cost among them, grant that firm a monopoly license at zero royalty (reflecting the true marginal cost of using the IP), and collect profit entirely through a lump sum payment from the monopolist licensee. Having a single firm downstream also does not sacrifice product variety, because the product is homogeneous by assumption.

In such an environment, permitting an unconstrained downstream monopoly might reduce overall welfare compared to the static first-best, of licensing priced at marginal cost, for two reasons. Total output will be too low, and price will exceed marginal cost. If, in addition, there is price discrimination between downstream consumers then the total output that is sold will be misallocated across

Compulsory Licensing, 90 J. POL. ECON. 470 (1982) and Louis Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, 97 HARV. L. REV. 1813 (1984). Scotchmer, *supra*, at 109 n.5. Kaplow applies the concept to assess on theoretical grounds the relative efficacy of raising a patent holder's profit through various practices that might attract antitrust scrutiny including price-restricted licensing, cross-licensing, restraints that facilitate price discrimination, and control of unpatented end products. Kaplow, *supra*, at 1855–88. Given informational and other constraints, however, he is ultimately skeptical about the practical ability to fine-tune the legal treatment of various practices based on this concept:

[A]n approach must be developed for those cases (which may be all cases) in which the practice in question may have any number of effects, some leading to far lower ratios than others. Unless one has confidence in our ability to determine at moderate cost which of the many possible effects are relevant in any particular instance, the best that we can probably do is to prohibit at least those practices that exhibit a serious potential for substantial loss.

Kaplow, *supra*, at 1888.

consumers.¹⁹ But that is basically the end of the story in terms of welfare losses.

Now let's consider some departures from the above stylized environment that could worsen the tradeoff between the welfare loss and the increased profit caused by permitting an unconstrained downstream monopoly.

Cost differences and asymmetric information: Suppose potential downstream producers have different costs and these are not perfectly known to the IP holder. If the IP holder decides not to license anybody and serve the downstream market itself, production costs may not be minimized. Of course, it is in the interest of the IP holder to try to select the lowest cost firm and profit from its superior efficiency through a higher lump sum fee. However, given asymmetric information about other firms' costs, the struggle over the division of the profits typically will yield an inefficiency: with positive probability the IP holder will end up producing instead of licensing a lower-cost firm. Downstream production cost then will be higher than under symmetric information, as assumed in the benchmark case, with adverse consequences all around. The inadvertent loss of productive efficiency reduces the innovator's profit. It also increases the loss to consumers through a higher price. For both reasons, letting the IP holder exercise unlimited discretion now gives us a worse tradeoff than in the benchmark case.

Product differentiation and imperfect contracting: Suppose that competing downstream firms would supply differentiated products—they would do somewhat different things with the IP. Product differentiation in general is valuable to consumers. Because of that, an IP holder would like to license multiple firms that offer differentiated products, *if* it could control their prices to prevent competition from eroding downstream rents. But such control is often imperfect, in which case the IP holder faces a profitability tradeoff: allowing competition adds product variety but limits pricing discretion downstream (notably, the ability to engage in price discrimination). The IP holder may then opt to sacrifice variety by having a monopolist seller downstream: itself or a sole licensee. The resulting loss of product variety would be another source of inefficiency that was absent in the benchmark case.

19. The misallocation arises because when different consumers face different marginal prices they will select quantities at which their respective marginal valuations are equal to the prices they face and, hence, will differ across consumers. Note that these two sources of welfare loss cannot simply be added; i.e., allowing price discrimination will misallocate the total output that is offered, but can expand output relative to uniform-price monopoly.

Complementary investments: The final departure from the benchmark scenario involves a situation in which the next stage is to make important complementary investments or follow-on innovations. There is economic literature on follow-on innovation. The basic story is that there is a basic innovation, but then other people can spend money to improve on it. Letting the first innovator charge an unconstrained monopoly price for its IP will reduce the return to follow-on innovators and can inefficiently reduce the probability of valuable subsequent investment.²⁰ This generates another downside to allowing the IP holder unfettered discretion that was absent in the benchmark case.

V.

REVISITING FIELD-OF-USE VS. ADJACENT-MARKET RESTRICTIONS

What does all this have to do with our story? Well, what is a field of use? Actually, U.S. courts have not put forward a definition,²¹ but the Supreme Court's *Talking Pictures* decision refers to licenses that are "limited to use in a defined field."²² The ability to define a field with enough precision suggests considerable knowledge about the industry contours. Consistent with this theme, a key regulation in Europe states that a field of use "must be defined objectively by reference to identified and meaningful technical characteristics of the licensed product."²³

This language suggests an environment characterized by considerable knowledge about how the IP might be used and a reasonable ability to contract effectively with licensees. Such conditions

20. See, e.g., John Vickers, *Competition Policy and Property Rights* 16 (Univ. of Oxford, Dep't of Econ., Paper No. 436, 2009), available at <http://www.economics.ox.ac.uk/research/wp/pdf/paper436.pdf>.

21. See Patterson, *supra* note 10, at 175.

22. Gen. Talking Pictures Corp. v. W. Elec. Co., 304 U.S. 175, 181, *aff'd on reh'g*, 305 U.S. 124 (1938).

23. Patterson, *supra* note 10, at 175. Patterson notes that, subject to certain conditions, field-of-use licensing can be exempt under the European Community's Technology Transfer Block Exemption Regulation (TTBER) of 2004. *Id.* at 172. The definition of field of use quoted in the text above is from the Guidelines accompanying the TTBER. Patterson emphasizes:

That definition is critical in the TTBER because if a particular restriction were not in fact a field-of-use license, but some other restriction, the TTBER might not exempt it. Analogously, it is the characterization of these restrictions as use restrictions that leads to a deferential treatment of them in the U.S., despite the fact that the courts have not articulated a definition of a 'use' restriction.

Id. at 174.

are more likely to hold, for example, in a mature industry where the products and technology are relatively simple. By appropriately structuring its field-of-use licenses, the IP holder in such cases may be able to limit downstream competition that would erode profits and still attain the product variety or other benefits from licensing multiple firms. Granting each licensee a monopoly over its designated field could sustain price discrimination downstream while exploiting the advantages of different firms in serving different segments.²⁴ In sum, well-tailored licensing restrictions can greatly mitigate the conflict between maximizing the IP holder's profit and creating unwarranted inefficiencies downstream. The welfare losses from granting an IP holder complete latitude over which licensees may use its IP and for what purpose then may be confined to those in the benchmark case discussed earlier.

By contrast, the designation "adjacent market" may reflect settings that deviate significantly from this characterization. The IP holder may be less informed about industry conditions and their evolution and less able to contract efficiently. Its attempts to restrict competition in the adjacent market could then spawn one or more of the additional inefficiencies beyond those in the benchmark case. For example, without the ability to contract precisely over the scope of another firm's downstream presence, the IP holder may prefer to forego the variety or other benefits such a firm could bring in order to retain pricing discretion downstream. Allowing the IP holder great leeway to prevent competition could then impose greater collateral damage on overall welfare than in the field-of-use scenario.

As mentioned, these are very preliminary thoughts, so I'll conclude with a question: Is this a potentially useful perspective for assessing why the law is more permissive towards licensing restrictions in the context of fields of use than in the context of adjacent markets?

24. The facts in *General Talking Pictures* track this scenario. AT&T held patents for vacuum tube amplifiers used in various applications. It licensed a subsidiary to serve the commercial field, which included talking picture equipment for theaters, and another licensee to serve amateur uses. That licensee was found to have infringed its license when it sold to theaters. *Gen. Talking Pictures Corp.*, 304 U.S. at 179–80.