Intellectual Property Rights versus Tax Incentives

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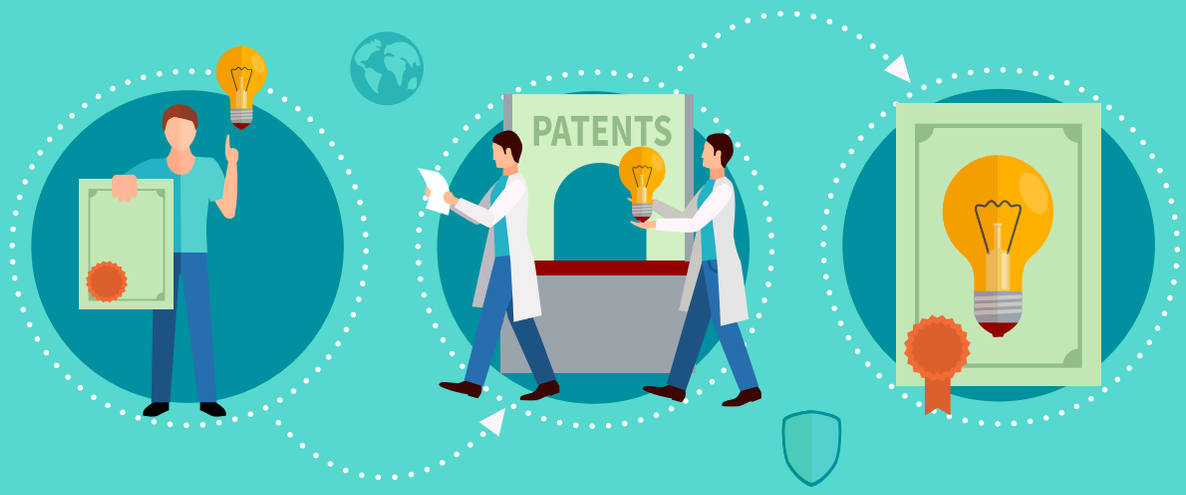

ABSTRACT

This study addresses the alternate problems associated with intellectual property: freeriding and monopoly. With respect to the "anticommons" problems associated with monopoly rights it examines the proposal of Boldrin and Levine (2008, 2015) for the extinguishment of all such intellectual property rights. In this study, a theoretical model of intellectual property production has been presented as a framework for discussion, in which the specific claims of Boldrin and Levine are considered, along with a proposal for the extinguishment of intellectual property rights accompanied by a self-funded system of value added taxes and intellectual property tax credits. Finally, it identifies the conditions under which such a system could encourage the production of intellectual property as well as the conditions under which no such tax incentives are required.

INTRODUCTION

As Boldrin and Levine (2008, 2015) and others have pointed out, creation and innovation builds on existing creations and innovation, so that intellectual property rights, which were originally created in order to encourage innovation, may now be having the opposite effect, and may in fact be discouraging downstream improvements to that innovation.

As Murray and Stern (2007) and others point out, there is an alarming "anticommons" trend, which is especially evident in the biotechnology sector, whereby the privatization of intellectual property threatens to deprive researchers of access to information and technologies necessary for the conduct of meaningful research. Among the examples provided in those studies are the patenting of genes and even the patenting of genetically modified laboratory mice.

The dilemma of course is now, and has always been, how to provide a means for innovators to recoup their research and development costs without restricting access to that technology by others who may be in a position to make incremental improvements to that technology. Clearly, the primary purpose of existing intellectual property rights law is to allow the recoupment of such research and development costs. However, the adversarial nature of patent and copyright litigation and the incentive towards frivolous patent and copyright claims threatens to undermine the production of such property.

Already, by the time of the Thurow (1997) and Heller and Eisenberg (1998) studies, there was a growing consensus that the present regime of intellectual property law in the United States was badly broken. Even if it were not badly broken, the political climate for the elimination of international protection for intellectual property under the TRIPS provisions of the World Trade Organization was all but irreversible, so that the end of intellectual property rights was all but assured. It is worthy to mention that the TRIPS agreement, which came into effect from January 1995, offers protections for copyrights, trademarks, industrial designs and patents among other items.

ARKET DISTORTIONS WITH AND WITHOUT INTELLECTUAL PROPERTY RIGHTS.

So as to avoid any one-sided analysis of the problem of intellectual property, we now present the two sides of the problem: the market distortions which exist without protection of intellectual property (hereinafter referred to as the free rider problem), and the market distortions created by exclusive patents and copyrights (hereinafter referred to as the monopoly problem).

Intellectual property by its very nature is a public good. This is due to the fact that although creators may have ownership rights over their creation, they are intended for public use. For example, millions of viewers may enjoy a show on television, but the creators of that show are entitled to copyright protection.

Without some form of protection for intellectual property, downstream producers would receive a windfall and would be at a competitive advantage in comparison to the creator, since they would be able to make full use of the created technology without being encumbered with the burden of its production cost. While Boldrin and Levine (2008, 2015) and others present, argument minimizing this problem, they nevertheless fail to extinguish it entirely. The bulk of their argument is that there is often a first mover advantage which accrues to the creator of intellectual property. They provide examples of first mover advantages involving short-lived intellectual property, such as software; and while first mover status seems to be advantageous with regard to such property, such first mover status would seem to be far less advantageous with longer lived intellectual property such as pharmaceutical drug formulas. We will provide a theoretical model to address this question and to investigate the degree to which the proposed first mover advantage would be necessary in order to sustain the production of intellectual property.

The second problem of course is the monopoly problem. It is easy to claim, on the basis of equity, that the creator of intellectual property should be allowed to exercise ownership rights over his own work product. Thus we have the creation of property rights over such work product. By definition, property rights are exclusive rights. Of course, it was never expected that the granting of such exclusive rights would lead to the kinds of problems enumerated above. In the Coase (1960) study of private ownership of intellectual property, it was proposed that private property rights would be perfectly compatible with universal access to property by non-owners. Under the reasoning of Coase, such access could still be made available by simple contractual arrangement, accompanied by a reasonable access fee. And thus it was expected that we could extend the reasoning of Coase to include intellectual property, and that we might grant such monopoly rights to the creators of intellectual property and still expect to maintain universal access to a common pool of scientific and technological knowledge. Hardin (1968) carried that logic one step further in his classic study of the "Tragedy of the Commons," which provides the basis for the argument that such a pool of common knowledge would not even exist, without the incentives created by exclusive property rights.

Of course Bessen and Meurer (2009), Depoorter and Vanneste (2006), Heller (1998), Heller and Eisenberg (1998), Paul (2000, 2001, 2003), and Lerner (2009) all provide documented evidence of the distortions and disincentives created by the current system of monopoly rights over intellectual property. Those studies document how the current system of intellectual property rights has led to excessive secrecy, litigation and to the frivolous and preemptive patenting of undeveloped technology and how it has operated to deny information and technology to others who might otherwise be able to make incremental improvements to that technology. Thus, those studies have documented how the granting of monopoly rights over intellectual property has stifled innovation.

ROPOSED MODEL

In order to put all of these arguments into a proper context, we next present a theoretical model to investigate the conditions under which potential intellectual property producers would have the incentive to act as a producer rather than as a free rider, even in the absence of intellectual property monopoly rights.

In this model, we propose a system of value added tax and tax credits. Let k be the cost of production of intellectual property; let c be immediate tax credit, expressed as a percentage of the production cost of intellectual property. Let q be the profitability index, or the ratio of the discounted value of incremental after tax revenues to intellectual property production costs k, where REV is revenue , T is the rate of corporate income tax, and r is the discount rate. Thus:

$$q = \frac{1}{k} \sum_{t=1}^{\infty} \frac{REV_t(1-T)}{(1+r)^t} \qquad (1)$$

We use the lower case q in order to draw an analogy with Tobin's Q.

Next, we let v be the rate of value added tax, and let be the free rider compensation factor. Both of which may assume values between zero and one. We assume that for each intellectual property producer there are n potential free rider firms ready to free ride on the production of that intellectual property.

We next construct a hypothetical system of value added taxes and tax credits which would satisfy three criteria. The first criterion, which we label incentive compatibility, is the requirement that the expected net present value from intellectual property production should be greater than or equal to the expected net present value from freeriding. The second criterion, which we refer to as the compensation constraint, is the requirement that the system should compensate the intellectual property producer for any value added taxes so as not to diminish the net present value of the typical intellectual property project. Finally, we have the budgetary constraint in which value added taxes collected by the taxing authority must be sufficient to fund the front-end tax credits of the intellectual property producer.

Incentive compatibility $-k + ck + qk(1 - v)$ $qk(1 - v)$ (2)

Compensation constraint ck qkv (3)

Budgetary constraint ck $qkv + n$ qkv (4)

Assuming that there are n potential free rider firms for each INTELLECTUAL PROPERTY producer, those constraints can be restated in terms of the credit percentage *c*:

Incentive compatibility c $1 - q(1 -)(1 - v)$ (5)

Compensation requirement c qv (6)

Budgetary constraint c $qv + n$ qv (7)

The Boldrin-Levine Condition

To put the arguments of Boldrin and Levine (2008, 2015) in proper context, we next investigate the conditions under

$$\lambda \leq \frac{q(1-v)-1}{q(1-v)} \qquad (8)$$

which no front-end credits are required in order to provide the incentives for the production of intellectual property.

We call this the Boldrin Levine condition. Under this condition, the firm will always choose to become a producer of intellectual property, rather than a freeloader, even if no front-end tax credits are provided. Thus, the theoretical arguments of Boldrin and Levine can be reduced to a simple factual assertion. Letting q = 3 and v = 0, we see that the firm will choose intellectual property production over freeloading so long as the payoff from freeloading is less that 67 percent of the payoff from intellectual property production. Further, we can see that higher values of the profitability index further raises the threshold which must be met before the firm chooses freeloading over intellectual property production. Is this Boldrin Levine condition met in a significant subset of opportunities? Clearly, the answer is yes. But, does it hold globally? Clearly, the answer is no.

Additional incentives provided by front end credits

Of course, we can raise the threshold required in order for the firm to choose freeloading over intellectual property production by introducing a self-funded system of front end tax credits, funded by a value added tax.

$$\lambda < \frac{c + q(1 \quad v) \quad 1}{q(1 \quad v)} \qquad (9)$$

Thus, we can increase the likelihood that the firm will choose intellectual property production over free riding by introducing a front-end tax credit; and where * is the critical level of free rider compensation, we can demonstrate that:

$$\frac{\partial \lambda^*}{\partial c} = \frac{1}{q(1 \quad v)} > 0 \qquad (12)$$

$$\frac{\partial \lambda^*}{\partial v} = \frac{c \quad 1}{q(1 \quad v)^2} < 0 \qquad (10)$$

$$\frac{\partial}{\partial c}\frac{\partial \lambda^*}{\partial v} \quad \frac{1}{q(1 \quad v)^2} > 0 \qquad (11)$$

ISCUSSION

We acknowledge the problems which currently exist in our system of intellectual property rights and have demonstrated that it is possible to achieve the desired levels of intellectual property production without such monopoly rights.

We propose a system of front end tax credits, funded by a value added tax. Such a system of tax incentives would allow the

producers of intellectual property to fully recoup the cost of their creations, while still allowing downstream innovators full access to existing technology. Further, such a system of statutory tax incentives would solve the dilemma of either confining all research and development to the public sector or of asking the state to pick winners and losers.

Such a system would be self-funded. With a system of value added taxes and credits in place, the net cost of the system would be zero. It would be relatively easy to administer such a system of taxes and credits, since it would utilize the right of offset, rather than outright grants.

Such a statutory framework would not place the taxing authority in the position of picking winners and losers, since the same taxes and credits would be applied to all intellectual property producers. Thus, it would relieve the state of the responsibility of determining which innovations are worthy of protection, as well as relieve the state of the responsibility of determining the appropriate scope of the patent protection to be granted. Cockburn et al. (2002) challenges the competence of patent examiners, and Merges and Nelson (1994) addresses the problem of determining the scope of the patent protection. With the proposed system in place, those questions become moot.

Finally, this system of taxes and credits would improve the competitive position of the United States vis a vis its international trading partners. Imports of copycat films, pharmaceuticals, or other technology would be subject to the full value added tax, without any offsetting credit for research and development costs.

TABLE I R AND D TAX SUBSIDIES OF OECD NATIONS

Country	Credit	Deduct	Rate	Other	Subsidy
Australia	45%				45%
Brazil		160%	34%		54%
Canada	35%				35%
China		150%	25%		38%
Croatia		250%	20%		50%
China		150%	25%		38%
Czech		200%	19%		38%
France	30%				30%
Germany				*	*
Hungary		200%	19%		38%
India		200%	30%		60%
Ireland	25%				25%
Israel				60%	60%
Italy	50%				50%
Japan	12%				12%
Lithuania		300%	15%		45%
Malaysia	50%				50%
Mexico				*	*
Netherlands				*	*
Poland	50%				50%
Russia		150%	20%		30%
S. Africa		150%	25%		38%
S. Korea	50%				50%
Spain	25%				25%
Turkey		100%	20%		20%
U. K.		225%	24%		54%
U. S. A.		100%	35%		35%
Average					40%

Deduct represents the percentage deductible from taxable income. Rate represents the top marginal tax bracket for that country. *Germany, Mexico and Netherlands have special subsidy arrangements. Source Deloitte (2014)

Such a system may already be in effect in other OECD (Organization of Economic Cooperation and Development) countries. Some of these countries offer the type of front end tax credits we have discussed, while others utilize a system of super deductions from taxable income in order to achieve that level of subsidy. On average, these countries offer subsidies of approximately 40 percent of cost for research (R) and development (D) of the type which is capable of producing intellectual property.

From this table, it would appear that the U. S. has tax incentives for the production of intellectual property which are comparable to those of our trading partners. However, there are substantial roadblocks in the way of firms enjoying the full 35 percent subsidy for the production of intellectual property under the U. S. tax system. Fogelberg and Griffith demonstrate that a significant portion of the research and development in the pharmaceutical industry is accomplished by small start-up firms, with the intention that they will later be purchased, merged or consolidated with the major pharma firms. Unfortunately, these small start-up firms have no way of utilizing their net operating loss deductions or intellectual property credits, since they have not yet introduced their products to the market. Further, we know that there are substantial limitations under the Internal Revenue Code and Treasury Regulations for the offsetting of these net operating loss carryforwards and credit carryforwards against the subsequent taxable income of the acquiring firm. (We here cite Internal Revenue Code sections 269, 382, and the separate return limitation year, or SRLY rules of Treasury Regulation 1.1502-21.)

For this reason, it may be appropriate to increase the credit rate as compensation for the delay and potential loss of benefit. Conceivably, the rate of credit could even exceed 100 percent. Alternatively, those credits could be made refundable, in which case they would not be limited to the amount of federal income tax which would otherwise be due.

Continuation of property rights for trademarks and brand names

This analysis comes with two caveats. The first caveat has to do with trademarks. Trademarks and brand names provide a necessary means for producers to develop reputations for quality and fair dealing; and the acquisition and preservation of reputation provides the incentive structure underlying most repeated game models. This is explained in Fudenberg and Tirole (1991), and Fundenberg and Levine (1998). Without property rights, protection for trademarks and brand names, producers would be operating under the condition of anonymity; high quality producers may be unable to distinguish themselves from low quality producers and the result could be the kind of market breakdown described in the Akerlof (1970) “market for lemons,” or in the Fogelberg and Krishnamoorthy (2014) “market for tomatoes,” the latter study

being a study of the sale of perishable goods with random observation.

HE PROBLEM OF SECRECY

The second caveat to this study has to do with secrecy. The present proposal offers no solution to the problem of secrecy, or of the withholding of valuable information which might otherwise be of benefit to other innovators. In fact, the extinguishment of intellectual property rights might even exacerbate the problem of secrecy. This scenario is quite likely, and even probable, due to the fact that creators of goods and services that might be beneficial to the public at large would be much more reluctant to share their innovations with the public if they do not receive some protection for its creation.

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