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Intellectual Property for Market Innovation

by Michael Abramowicz* and John F. Duffy**

Intellectual property protects investments in the production of information, but the literature has largely neglected one type of information that intellectual property can protect, information about the market success of goods and services. A first entrant into a market often cannot prevent other firms from free-riding on information about consumer demand and market feasibility. Despite the existence of some first-mover advantages, the incentives to be the first entrant in a market may sometimes be inefficiently low, thereby giving rise to a net first-mover disadvantage. Intellectual property can sometimes counteract this inefficiency by providing market exclusivity, thus promoting earlier entry. The goal of encouraging market experimentation may help explain some otherwise puzzling doctrines observed across many areas of intellectual property law. Nevertheless, traditional branches of intellectual property law are generally constructed to address other economic concerns and are now poor vehicles for encouraging optimal market experimentation. A possible remedy would be for the patent system to protect inventions that are technically obvious but whose commercial success is nonobvious. Although existing patent doctrine could be modified to provide such protection, the patent office is unlikely to be institutionally capable of judging commercial risks. An alternative approach would be to rely on market-based incentives to provide information about whether commercial success is sufficiently nonobvious to merit protection. Such an alternative is a promising avenue for legislative experimentation.

Intellectual property has long been understood as encouraging the production of information, in the form of scientific discoveries and literary works. Market exclusivity imposes a static cost, but the dynamic benefit of encouraging information production may make this cost worth bearing. This same logic, however, applies to a form of information to which intellectual property theory has paid little attention: information arising from market experimentation. The commercial success or failure of a new product or business model produces information on which competitors often can free ride. The creation of a new service may reveal to all, for

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example, whether consumer demand for that service is insufficient to support the business, just enough to support one business, or adequate to support the business and one or more competitors. Once this information is created, consumers will benefit from competition, but providing limited exclusivity to a market innovator in theory could provide dynamic benefits that might make the static cost of exclusivity worth bearing. The possibility of some exclusivity may promote launching of risky new business models that have a small chance of producing large success, in the same way that patent law encourages scientific experimentation that could fail but also could lead to significant new discoveries.

Consider, for example, the following business idea: an Internet-based service that will allow consumers to order delivery of items from a number of unaffiliated stores. Using a web browser, a customer could shop for produce from Safeway, clothes from Wal-Mart, bulk items from Costco, flowers from a local florist, and so on. The service's employees would shop on behalf of large numbers of customers at each of the stores, and the service would coordinate a distribution network that would combine the various orders and arrange for a single delivery to each consumer. Admittedly, this is a humdrum idea, requiring no more creativity than that of the average consumer. Society suffers little shortage of ideas of this type. What may be in short supply, however, are entrepreneurs willing to take a risk on ideas like this. Our own casual assessment suggests that it would be so expensive to create a sufficiently robust distribution network that this idea is probably a loser. Still, there is some small chance that the business model could produce sufficient efficiencies to make it highly profitable. That small chance might be sufficient if the first entrant could be sure of serving all consumers, but insufficient given the inevitable competition in the event of success. The problem is worsened because experimenting in one metropolitan area would give the company only a small head start in others. And so it is

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possible that this no one may have the incentive to conduct a market experiment in the idea even though the expected value of the experiment could increase social welfare.

Providing some form of intellectual property protection, such as a five-year exclusive right, might result in the implementation of a business model that otherwise would exist only in a would-be entrepreneur's imagination. We believe that intellectual property protection could result in a great increase in market experimentation, creating useful (and many useless) business models that otherwise would not exist. The benefit is parallel to that provided by patent and copyright, the creation of information that in many cases would not exist in the absence of protection. The dangers are parallel too. Excessively long protection may lead to costs in the form of suppressed competition that exceed the benefits. Even short periods of protection may be costly, if a business model would have been implemented even in the absence of any exclusivity.

Yet despite these risks, there is good reason to consider deploying exclusive rights to foster market experimentation. Private law regimes suggest that guaranteed exclusivity may sometimes be necessary for encouraging market entry. Franchise agreements, for example for fast food restaurants, routinely include grants of geographical exclusivity. The franchisor recognizes that a franchisee will be more willing to risk entry in a market if, in cases of wild success, that success will not have to be shared with a new franchise next door. A franchisee assumes some risk of failure, and an exclusivity arrangement assures the franchisee that it will also be able to enjoy much of the upside of the transaction. Current public law offers no general analogue to franchise agreements, but it was not always so. Industrializing Britain granted many franchises to the first business willing to enter the British market. That system has since been abandoned, and many commentators have viewed it as a misguided mercantilist policy because, unlike modern patents, those exclusive grants did not necessarily produce new technological

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information. But the old British policy might have been successful in encouraging market experimentation, and that might have been its primarily economic benefit.

Even in the absence of a regulatory regime specifically aimed at encouraging market experiments, various forms of intellectual property may promote market experimentation by augmenting the advantages that first movers in particular industries enjoy. A venerable economic literature has recognized that first movers enjoy significant advantages, though a more recent literature emphasizes that second movers have significant advantages too, in part because they can learn from the mistakes of first movers. This literature has been generally ignored by most but not all intellectual property scholars. F. Scott Kieff, in advancing his commercialization defense of the patent system, observes that patent law may promote commercialization of new technologies by offsetting second-mover advantages. Other forms of intellectual property also can promote market innovation by compensating for first-mover disadvantages, although they have not previously been seen in this light. Trademark law in particular protects first-movers by helping consumers to associate a new product with a specific brand. Contrary to conventional wisdom, we believe that this aspect of trademark law may be socially beneficial even where trademarks lead consumers to make poor choices from the standpoint of their own selfish private interests. Aspects of trade secret and to a lesser degree copyright law can also be seen as offsetting first-mover disadvantages and thus encouraging market experimentation. Consideration of market experimentation thus offers a new theoretical perspective by which to evaluate intellectual property law.

We do not, however, believe that the existing intellectual property system provides well tailored incentives for market experimentation. The business idea discussed above does not seem particularly clever. Many stores already offer delivery services, services exist that will provide

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delivery from a number of restaurants, and services also exist that will run errands for customers. Assuming that the “invention” is disclosed in prior art, or that the invention would be obvious to a person having ordinary skill in the art, no patent on the idea can be obtained. Trademark protection will not necessarily offset the first-mover disadvantage enough to provide a sufficient incentive for entry even if entry is socially optimal. On the other hand, if it turned out, remarkably enough, that no one had ever conceived the specific idea, and the patent examiner concluded that the combination of different stores in a single delivery system was nonobvious, then the originator of the idea could obtain a twenty-year patent. This might be far longer than necessary to induce entry into the industry, producing excessive deadweight loss.

The problem is that intellectual property protection does not depend directly on the extent to which it will promote market experimentation. This holds true even with – indeed, perhaps especially with – the modern advent of so-called business method patents. If the business method is sufficiently creative, a patent on the method might be worthwhile, but in such cases, the patent system will have served its traditional function of encouraging the conception of creative ideas that otherwise might never be discovered. In other cases, the business idea might be theoretically trivial, but the patent could nonetheless increase efficiency by promoting market experimentation. The difficulty is that the need for market experimentation is not a consideration governing whether such patents will be granted. Thus, sometimes business method patents may be granted on relatively trivial innovations that would have been marketed without patent protection. In other cases, patents might be refused to business methods that are obvious or not novel even though some economic incentive might be needed to test these methods. For example, it will probably not be possible, at least based on conventional analysis, to patent methods that are already disclosed in the prior art but that were never commercially successful.

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Yet the time may have come to revive or retest an idea that previously flopped. Where demand is uncertain, however, no one will have much incentive to sponsor the revival experiment.

It might be possible, however, to create intellectual property regimes attentive to this issue. One possibility would be to allow patents for “inventions” that are technically known or obvious but commercially novel and nonobvious. Just as it is possible under current law to obtain a patent for a previously known substance in its purified form, so too could one obtain a patent for a previously known idea in its commercialized form, at least where commercial prospects are risky. A potential problem with this approach is that patent office officials may not be institutionally well suited to determine when commercial success is nonobvious. Even with a hypothetical patent office that finds all novel business methods to be nonobvious, however, the system in theory might work tolerably well. Competition to obtain exclusive rights should lead to very early patenting, and patentees may wait a long period of time to commercialize patented business methods. The result in many cases would be somewhat earlier entry and relatively short periods of effective exclusivity, with an indeterminate effect on social welfare. Nonetheless, there may be instances in which this competition cannot occur, for example because a business model becomes obvious to numerous potential innovators at the same time, and at least one would be sure to implement the model even in the absence of protection. Unless we can rely on patent examiners to block patents in such cases, expansion of the existence patent system would be risky.

Our preferred approach would be to rely on a decentralized mechanism that does not depend on the discretion of patent officials. A simple bonding mechanism would require someone seeking a patent to offer to bet that the proposed business concept will not be developed in the time period of the requested exclusive right if no exclusive right is given. If no third party

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accepts the bet, then an exclusive right would be granted. If a third party does accept the bet, then there would be no exclusive right, and the resolution of the bet would depend on whether a firm, either the firm originally requesting exclusivity or another, implements the specified business concept. Because the bonding mechanism can be established so that odds are heavily in favor of the third party, the mechanism can limit exclusive rights to situations in which there is almost no chance that market experimentation will occur in the absence of the right. This is admittedly an unconventional mechanism, but if established in this way, it has virtually no downside, because the odds could make false positives (unnecessary protection) extremely unlikely. Over time, the mechanism could evolve in ways that would tolerate some false positives in exchange for additional market experimentation. Under this proposal, an initial system with only very modest, but almost certainly positive, effects could be gradually changed into a more economically significant new intellectual property regime.

We anticipate two broad classes of objections to the argument for intellectual property for market innovation. The first objection is that our proposal is a solution in search of a problem. Admittedly, we are handicapped in finding empirical support for our claim that the existing level of market experimentation is inefficiently low. If our thesis is correct, then many potentially viable business methods are not implemented. Unfortunately, it is difficult to measure what does not exist. We believe, however, that there are strong theoretical reasons to believe that incentives for innovation are insufficient. Industrial organizational scholars have long recognized that in many contexts, free entry will not lead to socially optimal results. We will focus in Part I on an additional factor that the industrial organization literature has largely ignored, uncertainty about consumer demand.¹ We will show in a static model why an entrepreneur may have inadequate

¹ Michael Waldman, *Noncooperative Entry Deterrence, Uncertainty, and the Free Rider Problem*, 54 REV. ECON. STUD. 301 (1987), considers uncertainty about demand in a context in which members of an existing oligopoly are considering whether to

incentives to experiment either with an entirely new business model or with a model previously tried elsewhere in a new geographic market. We will also consider other factors that may promote delay, such as uncertainty about the cost of supply, uncertainty about whether there will be other simultaneous entrants, and uncertainty about who will win a competition among various entrants.

The second objection is that, even if there is a market inefficiency, any remedy will necessarily be worse than the original disease. This objection misses the possibility that existing intellectual property regimes may already respond, perhaps more by accident than by design, to the inefficiency. The focus on market information thus improves our existing positive account of intellectual property theory, as well as our ability to assess normatively proposals to change existing intellectual property doctrine. We expand on this point in Part II. We acknowledge that massive extensions of intellectual property regimes, for example by permitting patents on business methods based on their *commercial* rather than *technological* nonobviousness, entails risk. Nevertheless, we believe that some limited experiment, such as an experiment limited to a single technology area in a single branch of intellectual property law, would be worthwhile. We believe, however, that the ideal system and experiment would involve decentralized market assessments made by private actors rather than government officials. In Part III, we begin with a minimalist “first case scenario” system that could do almost no harm, and we then discuss ways in which the system could be extended should initial experiments be promising.

I. THE EXPERIMENTATION PROBLEM

Justice Holmes’s famous defense of free speech insists that the “best test of truth is the ability to get accepted in the market”; the marketplace analogy works because of a general

take actions that might deter subsequent entry. This analysis, however, does not consider the problem of the first entrant into a new market.

assumption that markets at least succeed in sorting good and bad business ideas. Indeed, we agree that one of the strongest defenses of capitalism is that it facilitates the Shumpeterian process of creative destruction, ultimately promoting economic growth. Neither legal nor economic scholarship, however, pays much attention to the question of whether the degree of marketplace experimentation is optimal. This Part will seek to identify various reasons that market experimentation may be suboptimal, while also acknowledging the possibility that there might be some factors pushing in the other direction. The possibility that entry into markets may not be perfectly calibrated is nothing new. The economic literature on imperfect competition has long recognized the possibility that there might be too little or too much entry into particular markets. What differentiates our analysis from previous works on the welfare effects of free market entry is that we focus on entry into new markets, and that we emphasize the uncertainty of success and the entrepreneur's inability to prevent others from free-riding on information produced by market experimentation. Ultimately, though, our story describes a familiar market failure: Because market experimentation produces the positive externality of information, it is underproduced in the market.

A. A Model

1. The Wedge Between Social and Private Benefit

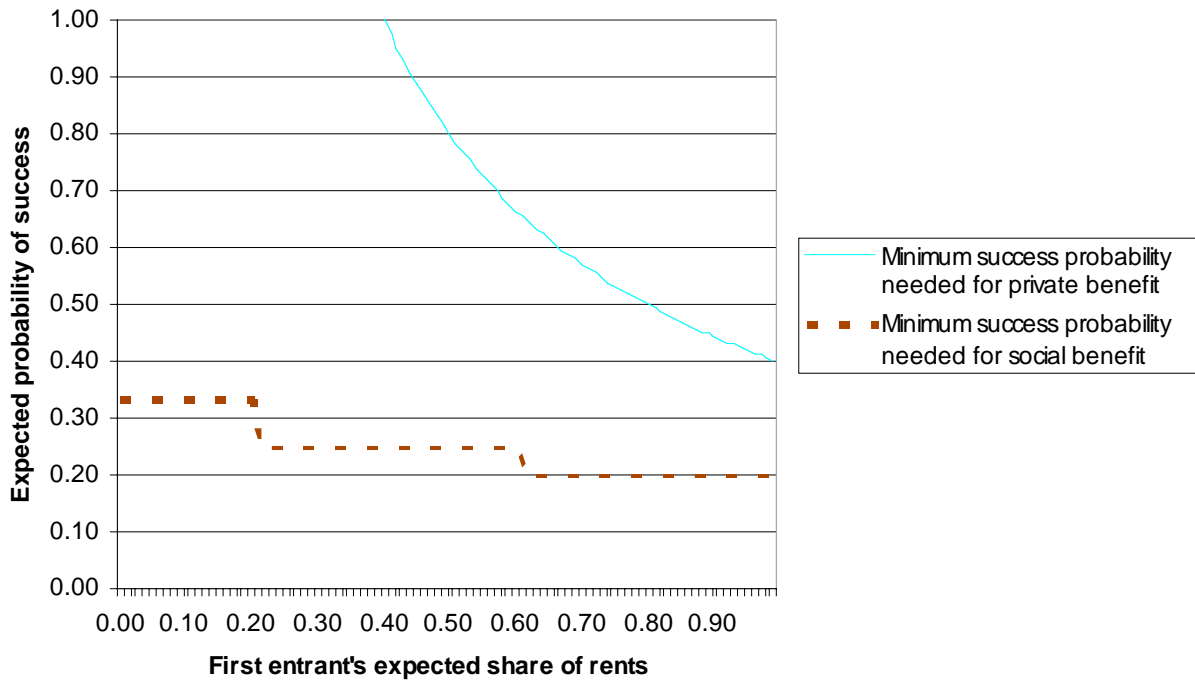
Our principal claims are that market experiments that would be socially useful may not be in the interest of any private party, and that increasing the degree of market exclusivity can promote social welfare by increasing the number of experiments private parties are willing to undertake. To gain an appreciation of how large the wedge between social optimality and private incentives might be, let us consider a simple model, which we will develop by starting with a baseline set of assumptions. A new business concept may end in success or failure. If it ends in

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failure, the first entrant's entire startup cost (assume for now \$1,000,000) will be lost. If it is successful, then there will be some gross social benefit from the experiment (assume \$5,000,000). Some portion of this social benefit (assume 50%) will be captured by the combination of the first entrant and the subsequent entrants, while consumers capture the rest, paying less for the service provided than the maximum that they would be willing to pay. Additional businesses may enter the market if the concept is successful for some cost (assume \$1,000,000 for this cost also). The number of businesses that will enter is the maximum possible without producing losses. The first entrant will capture some expected share of the rents, while the other entrants will share the remaining rents.

We will consider the full range of possible values of the first entrant's expected share of the rents. The first entrant can receive anywhere from 0 (in which case success is no better than failure) to 1 (monopoly). Figure 1 illustrates the minimum expected probability of success that will be needed for the experiment to be socially and privately beneficial for different possible values of first entrant's expected share. The x-axis reports the first entrant's expected share of rents (in present discounted value), while the y-axis reports the minimum expected probability of success for there to be a private benefit and a social benefit.

Figure 1: Probability of success needed for experimentation to be socially and privately beneficial



Consider, for example, the case in which the first entrant expects to be able to capture 50 percent of the rents if the experiment is successful. Because we have assumed that consumers capture half of the social benefit, the total rents are \$2,500,000, so the first entrant's expected rent in the event of success is \$1,250,000, and the first entrant's expected profit would be \$250,000. The market would then support one additional entrant, and the net social benefit would be \$3,000,000 (the \$5,000,000 in gross social benefit minus the total entry costs of \$2,000,000). If there is at least a 25 percent chance of success, then this experiment will be socially beneficially, because at that level the expected social benefit ($0.25 * \$3,000,000$) will just equal the expected cost from failures ($0.75 * \$1,000,000$). From the perspective of the potential first entrant, however, there must be at least an 80 percent chance of success to make

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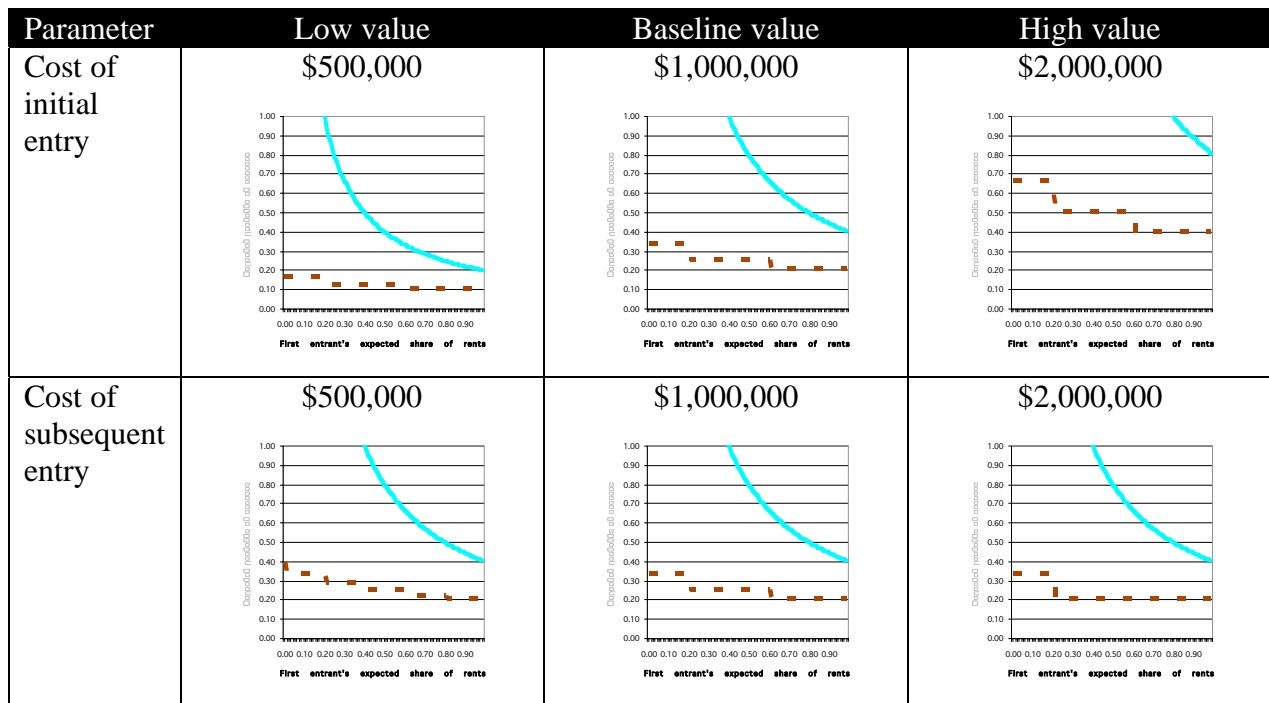
the experiment worthwhile. At that level, the expected private benefit of success ($0.80 * \$250,000$) just equals the expected private cost of failure ($0.20 * \$1,000,000$).

The gap between the social success and the private success lines reveals the market failure. Continuing the previous example, if the expected probability of success is anywhere between 25% and 80%, the experiment will be worthwhile but will not be attempted. For expected probabilities of success below 25%, the market failure makes no difference, because the experiment will be neither socially nor privately worthwhile. For expected probabilities of success above 80%, it also makes no difference, because the private party will undertake the experiment, and it will be socially beneficial. Whether a market failure occurs thus depends on the first entrant's expected share of the rents and expected probability of success. The overall magnitude of the failure thus depends on the distribution of these numbers across all potential projects. If we live in a world in which all potential projects have either very low or very high probabilities of success, and the first entrant's expected share of rents is sufficiently high, then the market failure might seem likely to make little difference. Empirical measurement is impossible, because there is no way to identify all of the potential projects that no one undertakes, but it seems likely that there are many potential projects in the middling probability ranges.

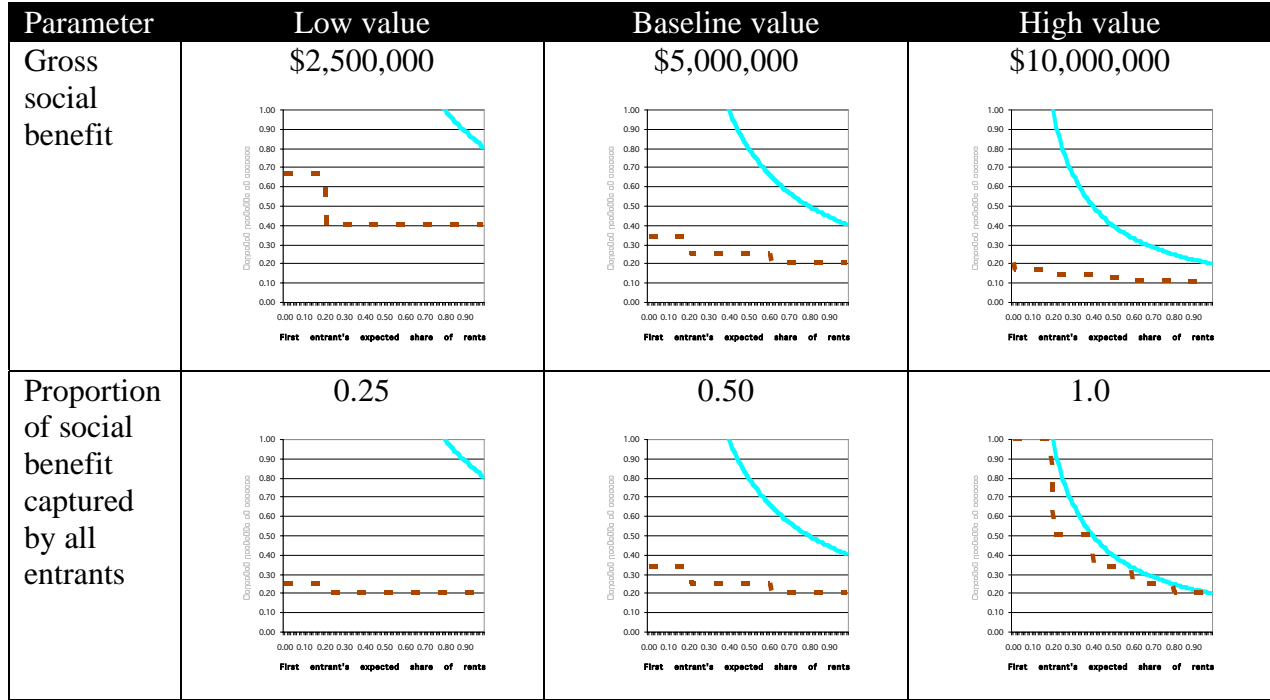
Our model is relatively simple, but our fundamental conclusion so far—that a considerably higher expected probability of success is needed to make experimentation privately feasible than to make it socially beneficial—is relatively invariant to our assumptions. Figure 2 illustrates the effect of changing many of the numeric parameters. Reducing the cost of the initial entry narrows the gap between the private and social minimum probability curves, because lower initial entry costs make the cost of the experiment less worrisome, while raising the cost of the

initial entry increases the gap. Decreases or increases in the cost of entry for subsequent entrants have only modest change on the social effects line. Increasing the gross social benefit in the case of success decreases the gap, because the upside of the experiment becomes more attractive, while reducing the gross social benefit increases the gap. The only possible change that would significantly alter our conclusions would be increasing the proportion of social benefit captured by entrants to near 1.0. At this level, rent-seeking virtually eliminates the portion of the social benefit not captured by the initial entrant, and so the private and social benefit of experimentation are virtually aligned. We find it doubtful, however, that firms will be able to achieve the perfect price discrimination that full private capture of social benefits would require. Reducing the proportion of social benefits captured by entrants (thus increasing the portion captured by consumers) increases the gap between private and social benefit.

Figure 2. Effects of changing parameters of model



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2. The Effect of Intellectual Property Protection

A principal effect of intellectual property protection is to increase the first entrant's expected share of the rents. This is so for two reasons. First, exclusive rights provided by intellectual property provide at least a limited period of time in which the entrant faces no competition at all, thus increasing the first entrant's expected share of rents, assuming that is calculated in terms of present discounted value. Second, the head start provided by an exclusive right may allow the first entrant to maintain larger market share even after the limited term is complete. Moving to the right on the x-axis almost always decreases the gap between private and social benefit, the latter of which falls slowly as a result of the decrease in rent-seeking associated with reduced entry.² For relatively small expected market share, a private party will be

² The caveat is that the social benefit is a step function, and so a slight move to the right could increase the gap between the two. The reason that it is a step function is that the number of entrants into a particular market must always be an integer. [CITE TO THE INTEGER PROBLEM IN INDUSTRIAL ORGANIZATION]

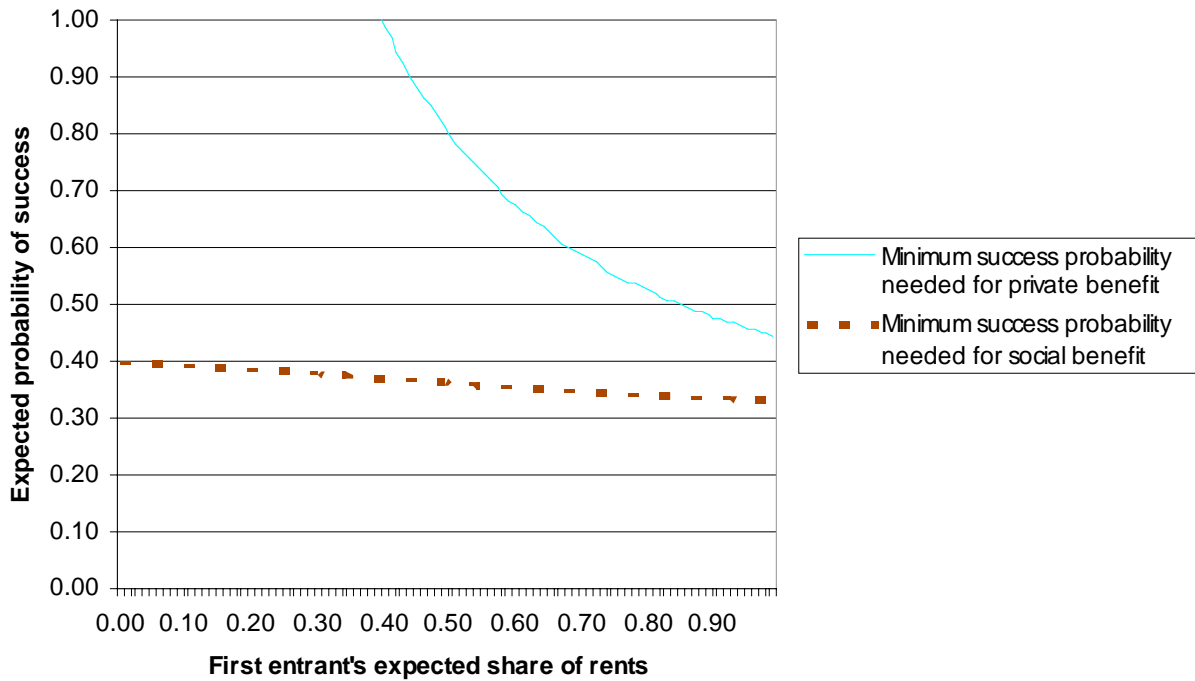
unwilling to undertake the experiment even if success is ensured, but as expected rents approach the monopoly level, experimentation becomes increasingly feasible.

It might appear that the conclusion that greater intellectual property will increase experimentation flows from a simplification in our model, specifically the assumption that the gross social benefit is fixed, regardless of the expected share of rents of the first entrant. After all, a central drawback of intellectual property rights is that they increase deadweight loss, as higher prices mean that some who value goods over marginal cost nonetheless will not purchase them.³ Indeed, we agree that a principal cost of increasing the first entrant's expected share of rents is this deadweight loss. Accounting for the negative effect of market power on social benefit, however, does not diminish the point that there will be a gap between private and social incentives for experimentation. Figure 3 illustrates. The assumptions underlying this graph are that, as the market share of the first entrant increases from 0 to 1, the gross social benefit falls from \$5,000,000 to \$3,000,000, and the proportion of social benefit captured by all entrants increases from 0.5 to 0.75.⁴ These numbers would represent a profound (probably unrealistically high) deadweight loss of 40%, plus a shift of half of the consumers' share of the remaining social benefit to producers. The most notable effect is an upward slope to segments of the social minimum probability curve, as increased monopoly power makes experimentation more socially valuable. Yet even this effect over the full range of expected rent shares is balanced by the benefit from reduced rent-seeking associated with increases in the first entrant's market power. Even where deadweight loss is high, incentives to enter markets still may be inadequate.

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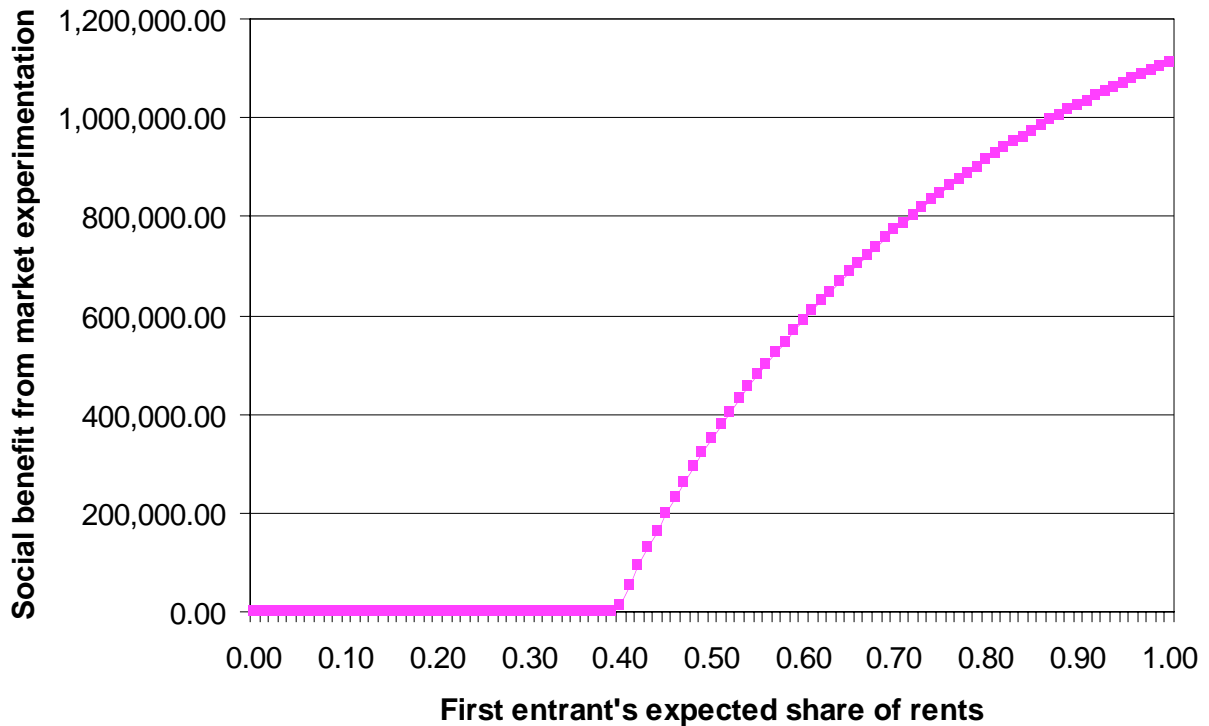
⁴ To make these smooth transitions plausible, Figure 3 also incorporates an assumption that a fractional number of firms can enter the market. This can be conceived in expected value terms, so that entry of 2.5 firms could be interpreted as equal probabilities that 2 and 3 firms will enter the market. Our principal conclusions are unchanged if fractional entry is disallowed, but the graphs would understate the benefits of additional entry, given the assumption that deadweight loss decreases uniformly with the first entrant's expected share of rents regardless of the number of entrants. A result of this function is to eliminate the step function visible in the social benefit curve in Figures 1 and 2.

Figure 3: Probability of success, where higher market entry produces deadweight loss and greater capture of social benefit by producers



By itself, this does not mean that providing intellectual property protection to encourage market experimentation is worthwhile. There remains the question of the magnitude of the cost, in cases in which protection was unnecessary and increases deadweight loss, relative to the benefit. We believe, however, that under a fairly wide range of assumptions, the social benefit will be greater than the social cost. Figure 4 illustrates the social benefit from market experimentation for different expected rent shares for the first entrant. Figure 4 retains the relatively high deadweight loss assumptions of Figure 3, assuming that deadweight loss increases uniformly. Figure 4 also assumes that for each of these experiments, the distribution of the potential entrant's expected probability of success is uniform between 0 and 1. Entry will occur only when this expected probability is greater than the minimum probability of success needed, as reported in Figure 3.

Figure 4. The effect of the first entrant’s expected share of rents on the social benefit from market experimentation

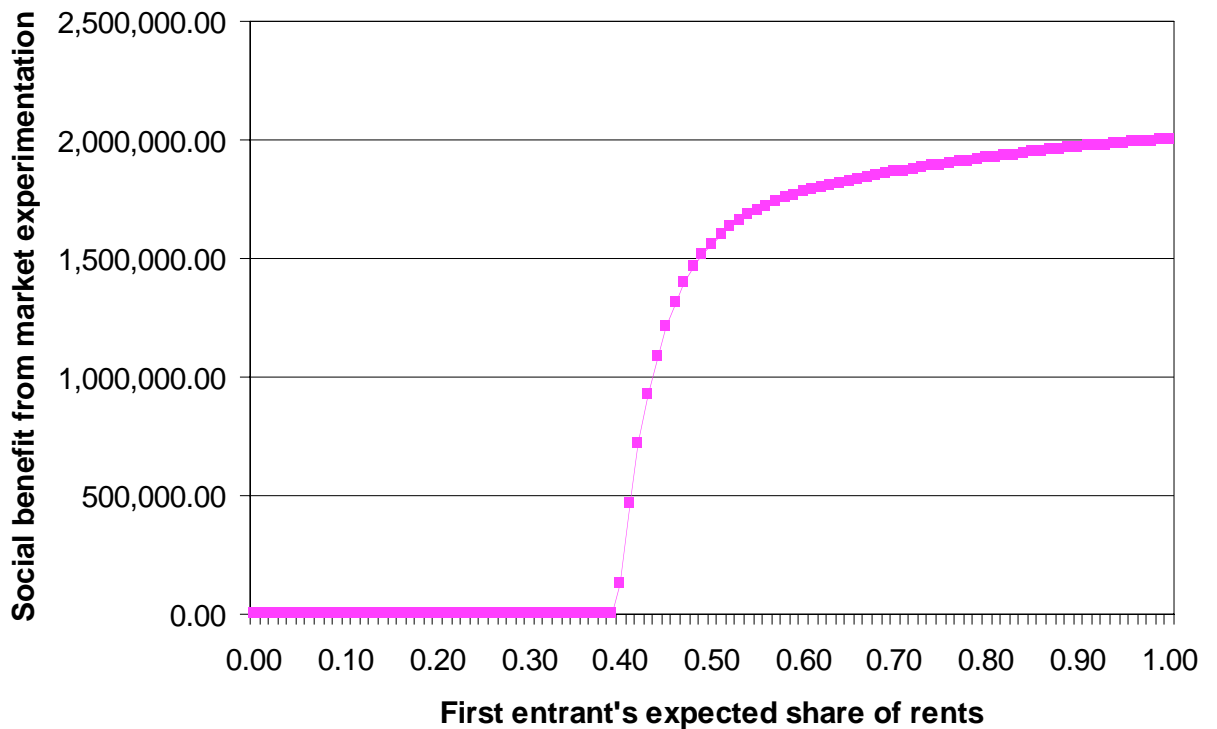


As Figure 4 demonstrates, the social benefit from experimentation rises consistently with increases in the first entrant’s expected share of rents. If intellectual property can increase these rent shares, this appears likely to increase social benefit even if intellectual property causes a large deadweight loss, reflecting a move to the right on the x-axis. Admittedly, this result reflects in part our assumption that the probability of success is uniformly distributed. Figure 5 represents a radically different assumption, where in almost all cases, the probability of success is extremely high.⁵ This (probably unrealistically conservative) assumption that there are many high value projects means that there will be a relatively high number of “false positives,” cases in which the increase in intellectual property protection was unnecessary, because market

⁵ We calculated this distribution by transforming the uniform distribution of probability of success according to the rule $1-(1-p)^{10}$. In this distribution, the expected probability of success is greater than 0.9 for 65% of cases.

experimentation would have occurred in any event. Even maintaining also our assumption that intellectual property imposes heavy deadweight loss, providing intellectual property protection still has the potential greatly to increase the social benefit from experimentation, although the social benefit curve flattens considerably for high expected degrees of rents for the first entrant.

Figure 5: Social benefit where expected degree of success is generally extremely high

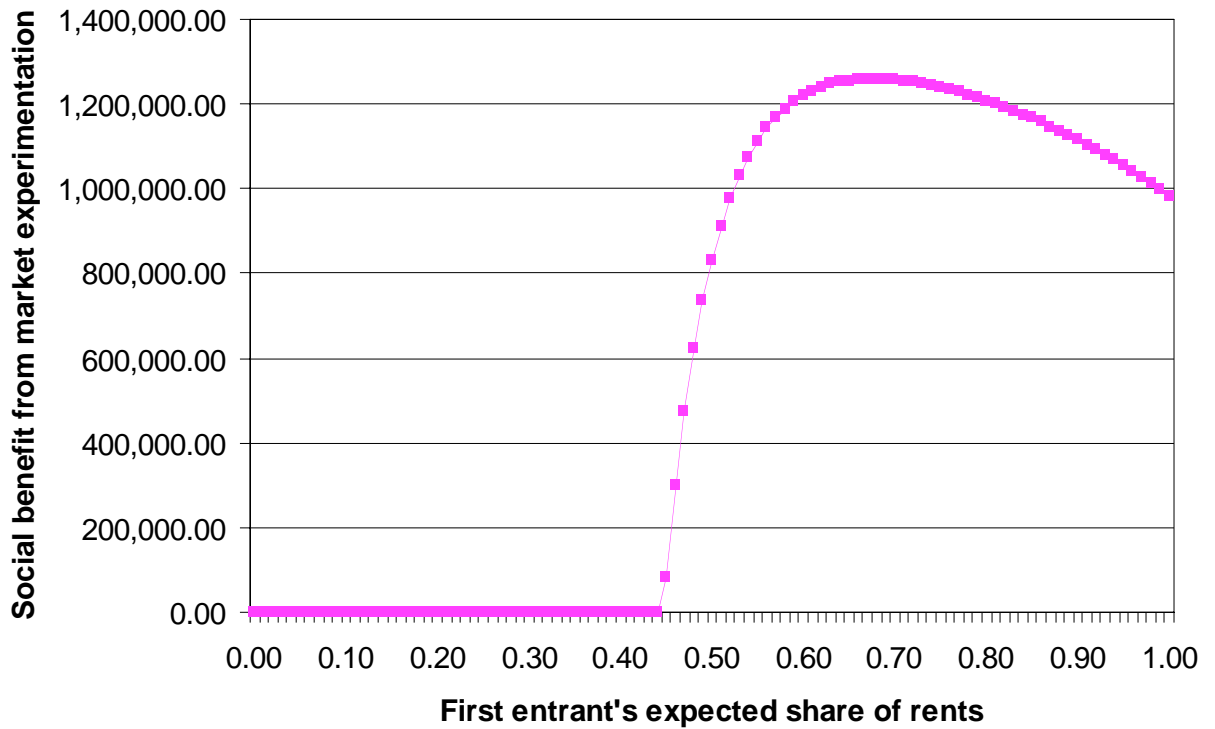


The general result is robust with various changes in the specification of the baseline model, such as changes in the cost of entry. At least in this simple model, it is difficult to identify any net social cost associated with intellectual property protection for market experimentation, even on the assumptions of Figure 5 that deadweight loss from intellectual property protection is high and that intellectual property protection is very often unnecessary because there are many high-probability projects. It is nonetheless possible to change assumptions in a way that makes it

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appear that increases in intellectual property protection can decrease social welfare. For example, Figure 6 reflects all of the pessimistic assumptions of Figure 5, but it is even more pessimistic about deadweight loss, assuming that the deadweight loss of monopoly power is 60%, so that gross social benefit falls from \$5 million to \$2 million. With these assumptions, very high expected rent shares correspond to decreases in the social benefit from market experimentation. It seems implausible to us that deadweight loss could be so high, or that there will be many markets in which expected rent shares will be so high in the absence of intellectual property that intellectual property would lead to lower returns. Within the framework of our model, intellectual property seems likely to increase social welfare given any plausible numeric parameters. If an effective case is to be made against intellectual property for market experimentation, flaws in our model must be identified. In the next section, we assess the effects of relaxing three structural assumptions of our model.

Figure 6: Social benefit where expected degree of success is generally extremely high and deadweight loss destroys 60% of gross social benefit



B. Caveats

a. Cognitive factors

In our analysis above, we assumed that although the prospective entrepreneur does not know whether a particular project will be successful, the prospective entrepreneur accurately measures the probability of success. Behavioral economics, however, suggests that many economic actors are overconfident about their probability of success in many endeavors, including business. Studies suggest, for example, that failure rents of new entrants are high, and some have even suggested that entry on average tends to produce negative economic returns.⁶ Of

⁶ See, e.g., Avishalom Tor, *The Fable of Entry: Bounded Rationality, Market Discipline, and Legal Policy*, 101 MICH. L. REV. 482 (2002).

course, these conclusions are based on private returns rather than social returns, and our analysis suggests that entrant overoptimism may be socially beneficial. Nonetheless, it will tend to reduce the wedge between private and social benefit in Figures 1 and 2.

Entrant overconfidence may thus reduce the benefits of intellectual property, but we doubt that this problem is sufficiently large to undermine our general argument significantly. While some individuals start businesses with their own money, many individuals use venture capital and other external sources of financing. These financiers have incentives to choose only to projects that they expect to be profitable, at least for themselves.⁷ The gatekeeper function thus prevents many individuals who have an inflated estimate of the probability of their prospective ventures' success from launching them. Cognitive biases, of course, may also affect financiers, but the finance sector as a whole is highly profitable, suggesting that institutions have at least some success in fostering workplace cultures that temper overconfidence. The possibility of entrant overconfidence may thus be greatest for projects that do not receive venture capital, but instead are financed by entrepreneurs, along with family and friends. On the other hand, projects rejected by venture capitalists have low probabilities of success, and the wedge between social and private benefits is greatest for low probability projects.

b. Demand diversion

So far, we have assumed that the market into which the entrepreneur is considering entering is entirely isolated from other markets. Virtually all products and services, however, are at least partial substitutes for other goods and services. A new product or service will owe part of any success that it achieves to customers who otherwise would have purchased other products and services. In the industrial organization literature on product differentiation, this phenomenon

⁷ Tor points out that “a negative expected value venture might still promise the financier a positive net present value.” *Id.* at 535.

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is called “demand diversion,” or, more vividly, “business stealing.” More commonly, this is simply called “competition,” but the economic literature on imperfect competition shows that competition does not automatically produce optimal entry. The literature demonstrates that because a market entrant does not take into account the effect of its entry on others already in the market, it is possible that there will be insufficient entry or excessive entry into new markets. If there may be excessive entry into a market, then intellectual property protection may have two competing effects. On one hand, such protection may reduce subsequent entry, potentially improving efficiency; on the other, it may make the creation of a new differentiated product that would receive protection more attractive, potentially reducing efficiency.

In our framework, demand diversion reduces the social benefit of market experimentation. A new good or service that decisively defeats an existing one may be only a bit better than what it is replacing, and the social benefit is properly measured based on the improvement in the good or service, rather than the total consumer and producer surplus that the new good or service receives. In some contexts, this effect may be so great that the social benefit curve in Figures 1 and 2, properly adjusted, could be above the private benefit curve for some range of expected rents. An important caveat is thus that the argument for intellectual property protection is strongest when the new market has relatively few substitutes. Uncertainty about demand, however, often may be greatest precisely when this is so. With any new good or service, uncertainty about success is substantial, but the uncertainty may be considerably lower when the new good or service differs in only a small way from existing goods or services. An intellectual property regime will be most defensible if it makes protection more likely for goods and services with a higher variance of expected returns.

c. Premature entry

The analysis above has been static, assuming that decisions on entry are made at a particular point in time. Yet even if market entry is inappropriate at one time, it might become feasible later. This may well occur for several different reasons. First, the cost of entry may decline, as technological improvements may make it possible to produce a new product or service at lower cost. Second, the gross social benefit contingent on success may increase over time, as a growing economy provides increased demand over time. Third, uncertainty may decrease as a result of other market experiments or other factors, and for some projects, the probability of success may increase. As illustrated in Figure 2, the first two changes narrow the distance between the private and social benefit curves, while the third change effects a vertical movement that may be sufficient to lead to production of the product or service. Appreciation of the dynamic nature of investment decisions thus emphasizes that the question often is not whether the first entry will occur, but when it will occur.

David Mills has offered a dynamic model of sequential entry in a growing market.⁸ In his model, a firm will enter when it anticipates that entry will be profitable, taking into account all of the decisions by subsequent entrants. Mills's model shows that from a social perspective, entry can be premature or tardy. The intuition underlying premature entry is that a firm entering knows that no other firm will enter until demand has grown sufficiently to make entry worthwhile. While the firm might wait if it had a property right that allowed it to do so, the benefit of deterring entry by other firms may make early entry worthwhile. The entrant accepts early losses for higher profits in a later period. Mills's analysis, however, assumes that potential entrants know the level of demand. At least when demand is highly uncertain, premature entry seems unlikely to occur, though the benefit of deterring subsequent entrants for a time in the event of

⁸ See David E. Mills, 39 J. INDUS. ECON. 659 (1991).

modest success may to some extent reduce the wedge between the private and social benefits of entry.

C. Types of Market Experimentation

So far, our model has been mostly abstract, identifying a benefit of market experiments without specifying the type of market experiments we might wish to encourage. In this section, we identify four types of experiments: launching of a new type of good or service (a new product market), creation of a new variety of an existing good or service (a new product feature), and sale of an existing good or service in a new location (a new geographical market).

1. New product markets

Suppose that the year is around 1997, and a venture capitalist is listening to a pitch by Reed Hastings of a company that he hopes to launch. The company, to be called Netflix, will rent DVDs by mail, placing them in envelopes to subscribers who select the movies over the Internet. Hastings initially plans to rent DVDs for a fixed price for a set period of time, but eventually may offer a deal in which subscribers can rent an unlimited number of movies for a fixed fee, so long as they have no more than a set number, such as three, out at any given time. The venture sounds risky. DVDs themselves are not yet a firmly established technology, and they might break or get scratched when shipped in flimsy envelopes in the mail. Consumers might prefer the spontaneity of a visit to the video store over ordering a movie for a later time. Video rental stores have traditionally made a great deal of money on late fees, which will not be a revenue source for NetFlix. Building a distribution center to process the envelopes could be expensive, and ideally there would be multiple distribution centers to minimize shipping time. Subscriber-based businesses typically take a long time to build, and yet the technology may have little long-term

viability, as the continued expansion of broadband capacity and cable companies' fiber-optic networks facilitates video on demand.

Worst of all, imagine that this new business manages to overcome all of these obstacles. Its success and happy customers would be difficult to hide. Competitors could then jump into the business, and indeed they might have significant advantages over NetFlix. The Blockbuster video chain, for example, might be able to undercut NetFlix by exploiting its existing relationships with movie studios. Blockbuster also might take advantage of its many individual store locations by sending DVDs from them, reducing the time of mail delivery, and by offering subscribers a chance to rent videos at Blockbuster as part of a package. Retailing giants, rich in customer brand recognition and relationships, also might compete. Wal-Mart could destroy NetFlix in much the same way that it outmuscles mom-and-pop retailers. A back-of-the-envelope calculation might be that there is only a one-in-three chance that the NetFlix concept will be successful and a one-in-three chance of maintaining sufficient market share to be more than marginally profitable. With an initial cost of perhaps \$100 million and small margins on each potential subscriber, the best case scenario would need to be of a multi-billion dollar consumer market for the investment to be worthwhile in expected value terms.

NetFlix might seem to be a poor example for advancing our thesis, because the business in fact was launched and emerged as successful despite the long odds.⁹ The case does suggest that first movers will sometimes have significant advantages wholly independent of intellectual property protection, for example because of network effects. Once NetFlix built large distribution centers, it was difficult for competitors to compete in selection and delivery time. Nonetheless, NetFlix advances our thesis because it is an example of a business that easily might

⁹ In part, the success may be because it did benefit from intellectual property protection, at least trademark, but also as we will see, patent law. *See infra* Part XXX.

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not have been, but for the persistence of its multimillionaire founder and venture capitalists who trusted him in part on the basis of his past business success. We cannot with certainty identify business ideas that would have been successful if only they had been implemented, but we can show how even businesses that proved to be phenomenally successful may at one time have appeared to be marginal projects or likely losers. Remarkably, even after NetFlix took off against the odds, there were many analysts in 2002 and beyond who doubted that it would be able to survive competition from Blockbuster and Wal-Mart. That it did, at least so far, stemmed in part from factors, such as the movie studios' desire to enter into generous contracts with NetFlix to diminish the market power of Blockbuster, that could not have easily been anticipated.

The NetFlix example illustrates many of the uncertainties that a new entrant faces and that provide an advantage to second-movers: uncertainty about demand (would consumers be interested?), uncertainty about supply (how expensive would it be to turn around DVDs?), and uncertainty about competition (could NetFlix survive?). NetFlix, of course, does enjoy some first-mover advantages, because of both positive consumer associations with its brand name and network effects. The large installed customer base may make a customer more likely to choose NetFlix than an alternative, both because NetFlix is likely to be the first company that comes to mind and because the large customer base may improve the usability of the NetFlix product, for example by providing NetFlix with a better database from which to make product recommendations based on collaborative filtering. Even if intellectual property protection was not necessary in the NetFlix case, for other businesses, the expansion of first-mover advantages provided by such protection might be essential.

Compounding the uncertainty that NetFlix faces is the danger that second and later movers may free-ride on the marketing and other promotion efforts of first movers. Even if

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NetFlix was sure that consumers could be persuaded that it makes sense to rent DVDs by mail, such persuasion might be expensive. Once NetFlix persuades consumers that the business concept is worthwhile, some of those consumers may so closely associate NetFlix with the concept that they will not seriously consider competitors. Others, however, may research competitors and choose lower-cost options. In our framework, the need to engage in marketing may make the entry cost for a first mover particularly higher, increasing the wedge between private and social benefit. A similar analysis applies to a case in which a first entrant will need to spend money on lobbying. One obstacle to supersonic travel, for example, is federal regulation of aircraft noise. Even if a particular company thinks that it can persuade Congress to change the rules, subsequent entrants may be able to free ride on that benefit. We recognize, of course, that advertising and lobbying sometimes may be inefficient, but there are at least some circumstances in which these activities can provide information that ultimately raises social welfare, and intellectual property protection can increase the likelihood of such activities.

Our analysis applies not only to products that are novel, but also to those that merely do not currently exist on the market. Suppose that NetFlix had initially failed. It might still have been the case that a later company could have succeeded, as the installed base of consumers with DVD players grew. In this hypothetical world, NetFlix might not have thought it worthwhile to go through the patent process, and so there would have been no patent protection under current law available to someone who wished to resuscitate the idea. While the earlier NetFlix experiment might have provided some information to a later entrepreneur, market conditions might still have changed sufficiently to make success uncertain. Just as with an entirely new product, the probability of success that the entrepreneur must expect for the project to be private worthwhile will be higher than the probability needed to make the project socially worthwhile.

2. *New product features*

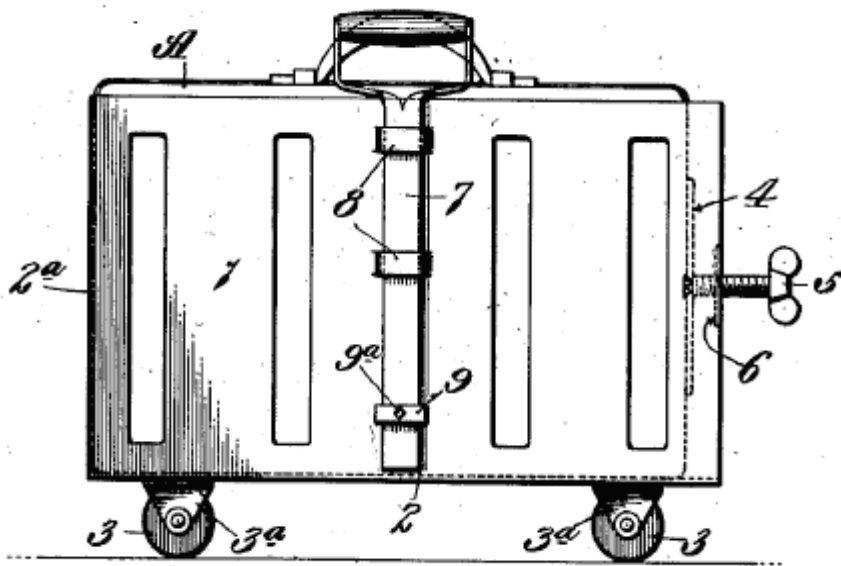
The analysis of new products applies as well to differentiated versions of existing products. A producer may be uncertain about the success of a particular product feature. If the WordPerfect word processing feature included a new feature – say, a search feature allowing the user to search for portions of a document containing a number of words not necessarily in order, as in Google – then Microsoft Word would be able to incorporate that feature as well, if it proved to be popular among users, unless this new feature met the requirements for independent patent protection. One would not expect this to stop innovation altogether, in part because introduction of a new feature gives the innovator a lead-time advantage. A software company with a successful new feature may be able to gain market share while others take time to catch up. Nonetheless, lagging companies may be wary of introducing new features that the market leader will quickly incorporate, and the leader will need to innovate only to induce its customers to buy new versions of the same program. The same logic can apply to features in a wide range of markets, helping to explain, for example, why many car safety features take so long to reach market.

The inability of an entrepreneur to secure the full benefits of a market experiment with new product features can help explain why some seemingly obvious product features take so long to emerge. A possible example luggage with wheels, a feature that came into common use only in the late twentieth century. The idea that adding wheels to luggage might be useful is old in the art. Consider Figure 6, an illustration from a 1914 patent application for a device that secured wheels to a suitcase.¹⁰ Even such a patent would give little market exclusivity, given the myriad other ways one might attach a wheel to a suitcase. (Wheels are very old in the art.) If a market experiment with wheels proved successful, established luggage companies would surely

¹⁰ [PATENT 1,099,933]

copy the innovation. This was, of course, precisely what happened once successful marketing of a suitcase with wheels finally occurred. While we cannot eliminate the possibility that other factors, such as technological innovations, may have contributed to the delayed widespread introduction of luggage wheels, the inadequacy of incentives to engage in market experiments may well have played some role.

Figure 6. An illustration from a 1914 patent



Our analysis also applies to more drastic transformations of products, for example from a local scale to a more global scale. Suppose that NetFlix had opened as a very small operation, relying on word of mouth to build a small group of loyal customers. That might produce relatively little information about whether a much larger scale project, involving numerous distribution centers located across the country, could be successful. Operation on a national scale allows for economies of scale and the potential for large profits, but profitability may require a qualitatively different marketing approach. An entrepreneur deciding whether to take a local

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product like NetFlix national might face considerable uncertainty about the feasibility of the project. Even where a business concept exists in some form, there may be inadequate incentives for entrepreneurs to experiment with the concept in another form, such as on a larger scale.

The inability to prevent second and later movers from free riding on advertising can be a problem in the product feature context as well. Consider, for example, a national fast food chain deciding in the 1990s whether to eliminate “trans fats” from its menu. There had long been scientific evidence that “trans fats” were harmful, but consumer awareness of the market research was low. Perhaps with sufficient advertising, a fast food chain could have convinced consumers of the dangers of trans fats and persuade them to give trans-fat-free French fries a try, but even then, the experiment might be a failure. Many health innovations, such as McDonald’s McLean Deluxe, do not catch on among consumers. Not only might the chain fail to draw in new customers, but it might lose customers who decide that they do not like the taste of trans-fat-free foods. Of course, if the experiment were successful, other fast food chains would copy the experiment, and so first-mover advantages might be weak. This theory may help explain why it took food manufacturers so long to begin introducing products with negligible amounts of trans fats. While the common answer to problems such as this is for the government to undertake educational campaigns to inform the public, our analysis suggests that intellectual property protection can be a useful alternative. Of course, we do not contend that intellectual property rights should be available whenever there is a danger that third parties will free ride off the marketing of others. The challenge is how to define these rights, a challenge to which we will return later.

3. New geographical markets

Even where a business concept is moved from one location to another without any meaningful change, the same logic applies. Consider, for example, a decision whether to open the first Ethiopian restaurant in a small city called Podunk. There may be some questions about whether Podunkians are ready for Ethiopian food, but if they turn out to like it, there might be enough market share for more than one restaurant. Once again, then, a potential entrepreneur faces the entire downside of an investment, but must share some of the upside with future entrants. Perhaps a restaurateur will be able to expand the restaurant or quickly open a second if the concept is successful, but for some types of restaurants, the optimal economy of scale is a single restaurant, so that the chef can keep careful watch over the kitchen. Even where the initial entrepreneur is incapable of expansion, an intellectual property right could encourage innovation, because the owner of a successful new restaurant concept could collect royalties from a subsequent entrant.

We doubt that the restaurant example provides the strongest example of the claim that incentives to experiment are suboptimal, in part because the experience of Ethiopian restaurants in other cities and the experience of other ethnic restaurants in Podunk may make the demand for Ethiopian cuisine in Podunk relatively certain. (There may still be considerable uncertainty about whether those opening the restaurant can execute the concept well enough for it to be successful.) The example, however, helps demonstrate how distinct our argument is from the traditional core ideas of intellectual property theory. Perhaps NetFlix can receive a valid patent on its envelopes or its business methods, perhaps our analysis supports an argument that patents on suitcases with wheels should be read broadly, but someone opening an Ethiopian restaurant seems unlikely to receive intellectual property protection based on technological innovation.

Even if the restaurateur develops new recipes, those have generally not received patent or copyright protection.

The market experimentation argument can apply as much in a local context as in a national context. Concerns about free-riding on marketing exist as much here as in other examples; the restaurateur may need to invest in marketing to persuade customers to give Ethiopian food a try. This observation suggests that concerns about market experimentation may bear as much of an affinity to trademark law, the one area of intellectual property in which protection can be limited to small geographic areas, as to copyright or patent law. It also emphasizes that any attempts at extending intellectual property rights to encourage market experimentation must be scalable and, perhaps more importantly, not block competition that would have taken place absent expanded protection. Like most diners, we believe that competition among restaurants generally improves consumer welfare, and so an intellectual property solution must be restricted to cases in which incentives for experimentation are genuinely necessary.

II. INTEGRATING MARKET EXPERIMENTATION INTO THE THEORY OF INTELLECTUAL PROPERTY

Our analysis in Part I shows that property rights for market innovations can increase social welfare by counterbalancing first-mover disadvantages and thus encouraging market experimentation. Yet intellectual property doctrine and theory appear to pay little attention to this concern. Intellectual property rhetoric apologizes for grants of monopoly, tolerating them only if there is some offsetting benefit, such as reduced consumer search costs or scientific innovation. Market experimentation is not recognized as one type of benefit that might justify the embarrassment of a monopoly. Nonetheless, the goal of generating market experimentation can help justify various intellectual property regimes and doctrines. Perhaps as importantly, market

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experimentation can help unify seemingly discordant doctrines across many areas of intellectual property law, providing a justification relevant not only for copyright and patent protection, but also for trademark and trade secret protection. These areas have fallen under the same umbrella of “intellectual property” solely because of the intangible nature of the property right, despite differences in underlying theoretical justifications. Unlike other intellectual property justifications, the goal of market experimentation is relevant to each area of intellectual property.

In this Part, we aim to explain how these existing intellectual property regimes may reinforce the goals of market experimentation and how that goal explains certain seemingly peculiar features of the law. Several caveats are in order. First, we do not claim that the goal of market experimentation is the only goal, or even the dominant goal in each area of intellectual property. We merely contend that each of the regimes advances this goal to some extent, though other goals may yet remain more important. Second, although the goal of market experimentation can help explain some intellectual property doctrines and trends, we do not claim to be offering a comprehensive positive theory of intellectual property law. Indeed, we suspect that there are many doctrines that seem inconsistent with the goal of encouraging market experimentation, and a goal of our analysis is to urge that some such doctrines be reconsidered. Third, we do not even claim to be offering a comprehensive defense of doctrines that do advance the goal of market experimentation. For example, we will argue that although business method patents may encourage efficiency by promoting market experimentation, patent doctrine generally is not well tailored to encourage market experimentation, and under existing patentability standards, business method patents could well do more harm than good.

We will proceed from areas in which the importance of experimentation is less obvious to those in which it might be more obvious. This organization highlights the relevance of market

experimentation to areas of intellectual property law in which it might at first appear to be entirely irrelevant. Trademark and trade secret have generally been seen as areas of intellectual property law with their own unique goals, but the market experimentation justification connects them to each other and to patent and copyright law. In these latter areas, the goal of encouraging experimentation (though not market experimentation) is more obvious, and so our analysis will be least revolutionary. But our analysis is most important in these areas, particularly in patent law, which has the greatest potential to serve as a regime that at least in theory could self-consciously promote goals of market experimentation.

A. Trademark

Trademark theory has generally been understood as a doctrine that economizes on consumer search costs. Once consumers associate a particular trademark with a particular source, preventing competitors from using that trademark allows consumers to purchase goods or services associated with the mark without engaging in further investigation to confirm the source.¹¹ While agreeing with the centrality of consumer search to trademark law, we also believe that trademark law helps foster market experimentation. Trademarks (along with service marks and trade dress) are central to allowing an entrant into a new market to maintain market share in the face of competition. If, for example, any competitor were permitted to use the label “NetFlix” to describe services similar to NetFlix’s, then NetFlix likely would lose much market share much more rapidly and completely once competitors saw the company’s initial success. This effect would occur even if the law allowed the “true” or “original” Netflix to identify itself uniquely in some way so that consumers could distinguish, with minimal effort, the original and copyist NetFlixes. The NetFlix product would seem less distinctive and attractive if every

¹¹ [LANDES & POSNER]

competitor used the same phrase. The goal of encouraging market experiments like NetFlix provides an additional justification for trademark protection (albeit one that in most cases will be coextensive in application with the classic justification of minimizing consumer search costs).

Our approach serves as an extension to a related, though less prominent, justification in trademark theory. This justification is that trademark helps protect producers' investments. Producers can safely make additional investments in existing goods or services, perhaps using advertising to inform consumers of the benefits of product improvements, without worrying that consumers will be unable to identify the improved product.¹² Similarly, producers can extend trademarks to related product areas, allowing consumers to draw quality inferences even about products that they have never consumed or heard about before.¹³ These justifications still relate to consumer search because, by making it easier for consumers to find the products that they want, trademarks encourage the production of products and groups of products that consumers will prefer. On our theory, it is useful for trademark to protect producers' investments regardless of whether trademark makes consumer search more efficient. We are not worried only about second-movers free-riding on the *reputation* of the first-movers,¹⁴ but also about second-movers free-riding on the first-movers' market experiments.

Under our analysis, trademark law should remain much the same even if we were to drop the assumption that trademark law helps consumers. In their classic analysis of the economics of trademark law, William Landes and Richard Posner anticipate the argument that "trademarks may create deadweight costs," by inducing "the owner to spend money on creating, through

¹² Landes & Posner, *supra* note x, at 269-70.

¹³ See Frank I. Schechter, *The Rational Basis of Trademark Protection*, 40 HARV. L. REV. 813, 823 (1926) (introducing this theory).

¹⁴ See Landes & Posner, *supra* note x, at 270 ("The free-riding competitor will, at little cost, capture some of the profits associated with a strong trademark because some consumers will assume (at least in the short run) that the free rider's and the original trademark holder's brands are identical.").

advertising and promotion, a spurious image of high quality that enables monopoly rents to be obtained by deflecting consumers from lower-price substitutes of equal or even higher quality.”¹⁵ Higher prices for brand-named goods, they note, have “seemed to some economists and more lawyers an example of the power of brand advertising to bamboozle the public and thereby promote monopoly.”¹⁶ Landes and Posner respond to these arguments first by noting correctly that the concerns have not actually influenced trademark, as opposed to antitrust, doctrine.¹⁷ They also defend trademark normatively, arguing that “[t]he fact that two goods have the same chemical formula does not make them of equal quality to even the most coolly rational consumer.”¹⁸ It may make sense for consumers to pay extra for guarantees of high quality manufacture, or to avoid the expense of determining whether alternatives are in fact of equal quality.

Landes and Posner’s empirical claim may be correct. Perhaps it is rational for consumers to pay a premium for a brand-name drug over a generic. Yet there is certainly no empirical evidence to show that, for example, generic drugs have inferior quality as compared to brand drugs. Unlike the classic justification for trademark law, however, our justification does not depend on such empirical evidence. Suppose that it could be shown that the application of trademark law in some identifiable set of cases reduced short-term consumer welfare, because consumers irrationally overestimated the quality benefits from purchasing from the most familiar brand. Landes and Posner would then need to recommend relaxation of trademark rules, unless some second-order consideration (such as litigation costs) was sufficient to save the doctrine. In contrast, we argue that trademark serves a useful function even if many consumers, acting solely

¹⁵ 274.

¹⁶

¹⁷ P. 274-75.

¹⁸ P. 275.

in their own private interests, are irrationally brand loyal. Firms will have more incentive to engage in market experiments in the hopes of becoming the next Tylenol if many consumers can be expected to develop a preference for the brand, irrational or not. Even if there is some static inefficiency to consumers' preferences for brand names, their preferences assure market entrants (using both existing but also new trademarks) of greater market share. This point is familiar to the literature on first-mover advantages, but that literature does not explain that this greater market share may be a social benefit by providing a dynamic incentive to engage in market experimentation.

The scholars who come closest to making the point that we do are Gideon Parchomovsky and Peter Siegelman, who also seek to move scholarship “towards an integrated theory of intellectual property.”¹⁹ They argue that trademark law can usefully “leverage” patent protection. Because some consumers are brand loyal, producers can expect to earn supracompetitive rents from a patented product even after the patent expires. As a result, trademark protection increases the benefits to investments in research and development that patent law, as well as copyright law and trade secret law, seeks to encourage. Meanwhile, trademark law imposes relatively little social welfare cost. To the contrary, producers have an incentive to increase output and lower prices during the patent period to increase their market share during the trademark period.²⁰ There need be no deadweight costs in the trademark period, meanwhile, because those consumers who find the price of the previously patented good too high can opt, at some small search expense, for competitors' lower-priced products, such as generic drugs. Siegelman and Parchomovsky thus question U.S. Supreme Court doctrine that seeks to prevent patentees from

¹⁹ Gideon Parchomovsky & Peter Siegelman, *Towards an Integrated Theory of Intellectual Property*, 88 VA. L. REV. 1455 (2002).

²⁰ *Id.* at 1473-81.

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using trademark effectively to extend patent protection, arguing that trademark leverage increases the benefits of patent law without any substantial economic cost.

Our argument extends the logic of Siegelman and Parchomovsky. Trademark is important not only because it increases incentives to engage in the type of research and development that already has the potential to produce intellectual property. Trademark is also important because it increases incentives to engage in garden variety market experimentation, commercialization of products that may not themselves be particularly technologically innovative and that may even have been long known to those skilled in the art. Indeed, trademark's capacity to leverage patent and other forms of intellectual property protection is a byproduct of its more general capacity to increase first-mover advantages and thus to generate greater incentives for market experimentation of all types, including but not limited to technological experimentation. As in Siegelman and Parchomovsky's model, this type of trademark protection (unlike the stronger intellectual property protection discussed later in this paper) has only a small risk of causing deadweight loss. As long as competitors enter the market, consumers who are not brand loyal can still purchase the relevant products at near marginal cost. Trademark protection is thus beneficial even if, and indeed more so to the extent that, consumers irrationally value familiar brands over unfamiliar ones.

Our analysis suggests that trademark law, perhaps entirely by accident, already helps to advance the goal of market experimentation. At least three seemingly odd features of trademark law are more justifiable in light of our theory. The first is the so-called "initial interest" line of cases, in which a firm uses a competitor's trademark to generate "initial interest" in the firm's own product. Many courts have held such practices to be trademark infringement even in the absence of any evidence that consumers would do business with the firm under the mistaken

belief that the firm was its competitor.²¹ Rather, the courts have justified finding trademark infringement on the theory that the use of a similar trademark or name would allow the firm to gain “crucial credibility during the *initial* phases of a deal.”²² Such holdings have been roundly criticized in the literature as unjustifiably departing from the basic theory on which trademark law is conventionally based,²³ but it is far more justifiable under our theory. Indeed, under our view, a second-mover’s use of a first-mover’s trademark is socially undesirable precisely *because* the use of the mark *does* lower consumer search costs.

Second, courts are generally reluctant to commit “genericide” by concluding that a trademark has become generic. Commentators have noted strong arguments that products like Q-Tips and Rollerblades have become generic as used by consumers, and yet they persist as trademarks. Genericide should be rare, because the first-mover advantages that such trademarks provide encourage market entry for future potential products. It is possible on some occasions that courts should still declare a trademark to have become generic, as a result of the additional consumer search costs that consumers must expend figuring out the lesser known generic name of such products. These search costs are generally quite small, however, given that stores will generally feature the generic alternatives next to the originals on real and virtual store shelves. Even if genericide would help alert consumers to the existence of cheaper competitors, it would not significantly reduce search costs or deadweight loss, and it would discourage future market innovation.

²¹ Mobil Oil Corp. v. Pegasus Petroleum Corp., 818 F.2d 254, 259 (2d Cir. 1987) (noting that the district court had *not* found that “a third party would do business with Pegasus Petroleum believing it related to Mobil”).

²² Id. at 259 (emphasis added).

²³ Robert G. Bone, *Hunting Goodwill: A History of the Concept of Goodwill in Trademark Law*, 86 B.U.L. Rev. 547 (2006) (collecting critical commentary).

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Third, our theory makes the cause of action of trademark dilution seem less alien to trademark law. The dilution cause of action, now codified in federal law,²⁴ explicitly protects branding, barring actions that may dilute a trademark even in the absence of any evidence that such dilution will cause consumer confusion.²⁵ The most common dilution theory is that use of a famous mark by a junior user for unrelated products (say, Hilton donuts) may “blur” the famous mark, diminishing its branding power. The dilution action has been controversial,²⁶ perhaps largely because the concerns of dilution seem largely independent of the concerns about minimizing consumer search costs and allowing producers to maintain and improve products. The action, however, makes more sense from a market experimentation perspective. Market innovators’ trademarks may enjoy prestige value above any inherent quality of the goods or services to which they are attached. Traditional theories of trademark law provide no reasons for encouraging the preservation of such prestige value, but market experimentation theory offers two. First, the anticipated value of a brand that turns out to be successful increases the incentives to engage in market experiments. Second, the dilution cause of action preserves the mark holder’s ability to use the mark on entirely new goods and services, increasing anticipated market share and thus the attractiveness of market entry. These arguments suggest that courts should perhaps not be too stingy in determining that a mark is sufficiently famous to qualify for the dilution cause of action,²⁷ although we recognize that the limited number of potential marks means that courts should not prevent use of a relatively unknown mark for unrelated products.

²⁴ See Federal Trademark Dilution Act of 1995, Pub. L. No. 104-98, 109 Stat. 985 (1996) (codified at 15 U.S.C. § 1125(c) (2000)).

²⁵ See, e.g., Julie Manning Magid et al., *Quantifying Brand Image: Empirical Evidence of Trademark Dilution*, 43 AM. BUS. L.J. 1 (2006) (providing an overview of the economic function of the dilution cause of action).

²⁶ See, e.g., Kathleen B. McCabe, *Dilution-by-Blurring: A Theory Caught in the Shadow of Trademark Infringement*, 68 FORDHAM L. REV. 1827, 1830 (2000) (discussing judicial skepticism toward the dilution cause of action).

²⁷ See, e.g., Monica Hof Wallace, *Using the Past to Predict the Future: Refocusing the Analysis of a Federal Dilution Claim*, 73 U. CIN. L. REV. 945, 959-69 (2005) (discussing the requirements for showing that a mark is “famous”).

B. Trade Secret

One of the most common justifications for trade secret law is that it serves a very similar purpose to the patent system: Protection of secrets encourages firms to invest in the production of valuable secrets. Yet this theory has some important difficulties. Trade secret law extends not only to technological information that may be difficult or costly to produce, but also to rather trivial information like customer lists and sales figures. Indeed, that sort of trivial information seems to be the real focus of trade secret law, for one of the main policies of the patent system is to ensure that nonobvious technical information *is* made public and *is not* kept as a trade secret. Thus, a firm can pay a heavy price for maintaining nonobvious technological information as a trade secret: Another firm may patent that information and enjoin the original creator's use. Yet, as for trivial information like customer lists and sales data, the incentive-to-produce theory seems difficult to maintain because that sort of information would be produced in the ordinary course of business even if intellectual property law did not provide any special incentive to produce it.

Another justification for trade secret law is that the law is trying to minimize what otherwise would be significant social costs associated with self-help remedies. This justification may be correct, but it depends upon the answer to an empirical question – whether the social costs associated with self-help would be greater than the social costs associated with trade secret law. There is very little evidence on this question, and so it seems a shaky justification for the doctrine.

A justification based on market experimentation provides a more solid foundation for trade secret law. Even if the social resources expended in enforcing trade secret law are greater than the resources that would be spent on self-help remedies, trade secret law may still be justified as an appropriate social subsidy to encourage market experimentation, provided

that market experimentation is itself socially desirable. A market experimentation view also accounts for why trade secret law would protect trivial information such as customer lists and other data that would be naturally produced during the ordinary course of business. The goal of trade secret law is not to encourage the production of that information so much as the production of the business. The existence and survival of the business is the important data the production of which society seeks to encourage. Since that data (the fact of a business's commercial success) is often hard to disguise, the law protects other business data so as to create a barrier against other firms entering the field and exploiting the business's market success.

C. Copyright

A market experimentation theory can also explain some of the oddities of copyright law. For example, it is well-known that copyright terms of protection have grown dramatically longer over the past 200 years. Current terms of protection are nearly equal to or exceeding a century in length. The additional years of protection recently added to the copyright term seem little justified in terms of providing an incentive to the original author to create the work. If such lengthy terms are justified (a matter on which there remains considerable doubt), a market experimentation theory provides a far better justification than an incentive-to-create theory. The decision to run an additional printing of an old book or a new release of an old film, accompanied with a sufficient marketing campaign to inform consumers, may be a highly risky business venture. It is, in effect, a test of the current market for the book or film. In the absence of copyright protection, the risk is borne entirely by the first mover. If the market proves favorable, second movers and consumers would reap a significant portion of the benefits. Yet, if the risk borne by the first-mover is too great and the portion of the benefits realized too little, the

market test will never occur. Consumers may be better off permitting the first mover to reap more benefits so that there are more market tests, and thereby a greater diversity of works, including old works.

Similarly, broad assertions of derivative rights make more sense if considered from the perspective of market experimentation. The popularity of a particular book or film often conveys significant information about the public's current tastes for similar types of works. Modern law seems to account for this problem by expanding the definition of derivative works.

It is here appropriate to note that the market experimentation theory does not necessarily lead to more and more expensive theories of intellectual property. Our point here is only that certain expansions of intellectual property may show that the courts and the legislature are sympathetic to the plight of first movers who engage in risky market experimentation. Once it is recognized that a desire to foster market experimentation may undergird some of these expansions in rights, courts and legislatures may be better able to tailor the law in a way that restricts intellectual property rights where those rights are not serving either traditional goals or market experimentation. For example, lengthy or renewed copyright terms perhaps should be available not generally to all copyrighted works, but only to those works for which there is a real need for market experimentation.

D. Patents

In the modern era, the standard justification for patents is that they are necessary to encourage the production of useful technological information. This justification accounts for many of patent law's major features, including (1) the requirement that the patentee provide a complete and enabling disclosure of the patented subject matter; (2) the prohibition against patenting non-novel or obvious subject matter, with novelty and nonobviousness defined on the

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basis of all or nearly all information that is publicly available anywhere in the world; and (3) the general absence of any requirement that the patentee actually commercialize the patented subject matter. Nevertheless, a market experimentation theory rides an explanation for certain historical, and indeed even current, patent practices. We outline three such practices below. With respect to the current practices, we show how these practices can lead to inefficient results unless other modifications of patent doctrine are also made.

Our first example concerns an ancient type of patent – the so-called “patent of importation.” This type of patent gave exclusive rights to a party that first imported and commercialized products and processes from another country. Intellectual property scholars have long disparaged such patents, because they do not directly encourage technological innovation. Indeed, the patentee need not have had any claim to have been an independent creator of the technology; encouraging intellectual effort was plainly not the goal of these patents. Our focus on the benefits of encouraging market experimentation suggests that such patents might have been beneficial, at least at times. If, for example, there was considerable uncertainty about local demand for a technology practiced elsewhere or about the feasibility of local supply, then in the absence of protection, the first business to try a technology would be providing an experiment for potential competitors. Patents of importation therefore might have promoted market experimentation that otherwise would have occurred.

While patents of importation are merely a part of history now, two features of modern U.S. patent law – the recognition of business method patents and the weakening of the traditional nonobviousness standard – are quite plainly linked to a theory of market experimentation. We can make this assertion with confidence because each of these two developments was pioneered and encouraged by Judge Giles Rich, who expressly endorsed the view that patent law should be

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designed to provide “an inducement to risk an attempt to commercialize the invention.”²⁸ That “‘business’ aspect of the matter,” Judge Rich noted, “is responsible for the actual delivery of the invention into the hands of the public,” and such public benefits should be viewed as providing the core justification for the patent system.²⁹

Over a half century after then-lawyer Rich wrote those words, business method patents became firmly established in the United States courts in *State Street. Bank & Trust v. Signature Financial Group Inc.*,³⁰ an opinion authored by Judge Rich. In some circumstances, business method patents could be justified without resort to a theory of encouraging commercialization or market experimentation. For example, the creation of an innovative technique in business such as the Black-Scholes method for pricing options might be viewed as highly analogous to the production of new technological information in a traditional field of engineering. But this category of business innovations does not exhaust the current class of business methods that are patentable under United States law. Indeed, the Board of Appeals of United States Patent and Trademark Office recently held that a business method patent need not make any “technological” contribution to the art.³¹ Such nontechnological business patents can be most easily justified on the grounds that they encourage the development and market testing of economically nonobvious methods.

Another major development of U.S. patent law during the late 20th century is the weakening of the traditional nonobviousness standard. The traditional view of nonobviousness requires the patent specification to have revealed some significant new technological information. Between 1982 and 2006, the Federal Circuit Court of Appeals dramatically

²⁸ See Giles S. Rich, *The Relation Between Patent Practices and the Anti-Monopoly Laws* (pt. 2), 24 *J. Pat. Off. Soc'y* 159, 177 (1942).

²⁹ *Id.*

³⁰ 149 F.3d 1368 (Fed Cir 1998).

³¹ *Ex parte Lundgren* (USPTO Bd. of App. 2006).

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weakened this standard of obviousness by requiring proof of a teaching, suggestion, or motivation in the prior art before any permutation of old technology could be considered obvious. In taking this step, the Federal Circuit was led by Judge Rich. Such a watering down of the nonobviousness standard is very hard to justify if the primary goal of patent law is to encourage the production of new technological information. If, on the other hand, the patent system is designed to encourage the commercialization of new but not necessarily technologically innovative products, then the dramatic weakening of the nonobviousness standard is understandable. Indeed, a logical extension of the theory would permit patents to issue on products that were technologically not novel, provided that the products did not exist in the marketplace.

In recognizing that these two recent developments in US law could be justified on the grounds of encouraging market experimentation, we do not mean to suggest that these are necessarily positive developments. To the contrary, we believe these developments could lead to dramatically inefficient results unless other aspects of patent law also modified. Most importantly, current US patent law does not require a patentee to bring the invention to market nor have the courts considered the post-patenting activity of others as a reason to invalidate an issued patent. In combination, these features of patent law provide an opportunity for patentees to free ride off the efforts of the true first movers in a field. A good example is provided by the recent “Blackberry” litigation. The patentee in that case held very broad patents on the technological capability of sending e-mail via a wireless network to a wireless device. Technologically these patents are highly suspect and most likely obvious. It is nonetheless possible to believe that the development and commercialization of a wireless e-mail product entailed enormous market risks, though those risks were economic and nontechnological. But if

so, those risks were born by Research In Motion (RIM), the first mover that developed and commercialized the Blackberry. Yet the patent system of the United States produced what is in our view a startlingly backwards result: RIM was forced to pay more than a half billion dollars to the patentee who had risked nothing in the commercialization of the technology. Thus, rather than rewarding the first mover, the patent system imposed an unjustified tax upon the company.

The failure of the US patent system in the Blackberry litigation leads to the obvious question whether the system could be modified so as to provide justifiable rewards for the commercialization of economically nonobvious products, without rewarding pretenders. We believe that current patent doctrine does have sufficient flexibility to achieve this end, though we worry that the current institutional structure of the system may be poor at identifying examples of commercial nonobviousness.

While current U.S. patent law has no clear doctrine permitting the nonobvious feature of the invention to be related solely to commercialization (as opposed to technical achievement), U.S. patent law allows the commercial success to be considered as a factor in nonobviousness analysis. Thus, if the commercializer can make even a relatively modest change to previously known subject matter, the modified invention may be patentable if it is commercially successful and the previously known version was not. Nevertheless, U.S. law on this subject is not clear. Currently, the law requires a “nexus” to exist between the alleged invention and the invention’s commercial success. The application of that “nexus” test is fraught with uncertainty, and if the commercializer’s real contribution lies merely in testing the commercial viability of the product or in explaining the benefits of the innovation to the public, then the nexus requirement may be deemed to be not satisfied.

Unlike the United States, at least one country seems more open to the possibility of allowing patents based merely on commercial nonobviousness. India's newly amended patent statute provides that the standard of patentability, or inventive step, can be satisfied by a feature of an invention that either involves a "technical advance" or has "economic significance."⁶⁶ The invention still is required to be "not obvious to a person skilled in the art," but the structure of the statute strongly suggests that the nonobvious quality may be economic or technical. This statutory language at least opens the possibility that patents could issue on technically trivial variations of prior art if the modified invention is successfully commercialized and if that economic success would have been nonobvious to a person of skill in the art.

We are willing to take the theory an additional step. If the law is willing to recognize commercial nonobviousness, then it should also be willing to recognize commercial novelty. Consider a prophetic invention that was previously patented but never commercialized. The patent has now expired. Black-letter patent law precludes a new patent from claiming precisely the same invention, but patent law also allows attorneys to be creative in drafting patent claim language to avoid prior art. The attorney defines "novelty" in the drafting of the claim. This feature of patent law holds out the theoretical possibility that the attorney could distinguish noncommercialized prior art by restricting a claim to the "successfully commercialized" product.

One famous and analogous example of such artful claim drafting is found in the patent at issue in *Parke-Davis & Co. V. H.K. Mulford & Co.*⁶⁷ The case involved a patent claim to a purified natural substance (adrenaline). The claim was attacked as invalid because the substance itself was naturally occurring and therefore, the argument went, the patent claim was not novel.

⁶⁶The Patents (Amendment) Act, 2005, § 2(ja) (available at http://www.patentoffice.nic.in/ipr/patent/patent_2005.pdf).

⁶⁷ 189 F. 95 (S.D.N.Y. 1911), aff'd, 196 F. 496 (2d Cir. 1912).

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In rejecting that argument, Judge Learned Hand reasoned the claim to the purified natural substance should be recognized as a novel because it was “for every practical purpose a new thing commercially and therapeutically.”⁶⁸ Hand stressed that there were the “ample practical differences” between the claimed purified substance and the prior natural substance, and that the line between the novel and not novel should be “drawn rather from the common usages of men than from nice considerations of dialectic.”⁶⁹ Hand’s reasoning now undergirds whole fields of patenting; for example, most patents on DNA are claimed in the *Parke-Davis* format. Recognizing a claim to a “commercialized” product as novel despite an earlier patent or other document disclosing the precise same product would be no more doctrinally difficult than the step taken by Judge Hand in *Parke-Davis*. Commercialized inventions are “for every practical purpose a new thing commercially” even if the prior art discloses an uncommercialized version of identical technology.

As we have previously mentioned, our theory suggests both extensions and limitations on existing intellectual property doctrine. Thus, if the patent system were to permit patents on commercially new and nonobvious developments, the patent system would have to ensure (1) that such developments really were commercially nonobvious and (2) that the patentee (or the patentee’s licensee) actually bore the risks of commercialization. The latter restriction may be the easier of the two to achieve. Where a patentee has obtained a patent on the grounds that commercialization of the product is the difficult and nonobvious step, the patent could be invalidated if the patentee was not the party who actually engaged in commercialization. In such a case, the courts would simply refuse to recognize the patentee as the true “inventor” of the

⁶⁸ Id. at 103.

⁶⁹ Id.

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commercialized version. Similarly, if other parties engaged in commercialization in parallel with the patentee, those parallel efforts would provide strong evidence that commercialization was not risky and the economic prospects of the commercialized product were not nonobvious.

Despite these limitations to existing patent doctrine, “commercialization patents” could still produce economic harm if the Patent Office were generally unable to identify instances of commercial nonobviousness. If the Patent Office issued patents on developments that could obviously be successfully commercialized, those patents should be invalidated by the courts if multiple parties other than the patentee engage in commercialization. In theory, the prospect of invalidation may be sufficient to encourage competitors to enter the market despite the existence of the patent. But the patent may chill entry if, as seems likely, competitors view litigation as risky and uncertain. Thus, commercialization patents may be economically beneficial only if the Patent Office is sufficiently good at identifying instances of commercial nonobviousness. The current structure of the Patent Office, under which a single examiner evaluates the merits of an application, seems unlikely to produce good judgments about market viability. Indeed historically, the Patent Office has tried to avoid making judgments about marketability. Nevertheless, the Patent Office is now engaged in a new experiment to provide for “peer review” of patent applications. Under this method, the Patent Office widely distributes patent applications by posting them on the internet. The Office then receives comments on the patent applications from a large variety of sources. Such a system may be much better at generating information concerning commercial nonobviousness. Indeed, the applications that evoke guffaws from peer commentators may be precisely the ones that the Patent Office should grant, if the peers’ ridicule stems from a shared belief that the subject matter in the application is commercially fanciful.

In general, we believe that the proposed modification of the patent system to allow for some “commercialization” patents holds sufficient promise that it should be attempted in some cases where the hurdles to commercialization seem particularly daunting. Nevertheless, we recognize that the patent system may not be the optimal system for encouraging market experimentation. Below we consider an alternative that is more precisely tailored to the underlying theory.

III. REFORM BEYOND THE PATENT SYSTEM

A decentralized mechanism for determining whether intellectual property rights should be granted for market experimentation can solve the principal defects of using the patent system. Rather than rely on governmental officials, a decentralized system provides financial incentives to private parties who have or can acquire expertise in particular markets to reject patent applications. At the same time, it can provide incentives for the prospective patentees themselves to specify the scope and terms of the intellectual property protection, forcing a prospective patentee from claiming scope that likely would have been created anyway. Perhaps most importantly, a decentralized system can be introduced gradually, so that it applies initially only to a very small number of cases in which the case for protection is very strong, and perhaps only then expanding to a more significant regime. Part IV.A describes a simple bonding mechanism that can serve as a “first-case scenario” for providing intellectual property for market experimentation, and Part IV.B explains how protection might be expanded if the initial experiment proves successful.

A. First Case Scenario: A Bonding Mechanism

To apply for intellectual property protection for market experimentation, an entrepreneur would first delineate the property right, describing the market experiment to be performed. This

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property right would include a term of years selected by the entrepreneur, and it would describe the market experiment to be protected. The description would specify the nature of the market experiment, and it might limit the proposed protection, for example by specifying a minimum scale for the proposed business or other aspects of how the business will operate. The entrepreneur would then deposit the application with a government agency, paying a deposit (say, \$10,000, although the required deposit might usefully vary depending on the proposed scale of the market experiment). The agency in turn would make the application publicly available on the Internet. Any private third party would be allowed to reject the market experiment by placing a separate deposit with the government agency. At least in the initial experiment, this deposit should be considerably lower than that paid by the entrepreneur (say, \$1,000).

If no third party rejects the property right, then the property right would be granted, and it would be published on the Internet as an accepted application. The recipient of the right would then be able to enforce it against third-party infringers. While the precise contours of this enforcement regime could be debated, at least the right holder would be able to receive damages for any infringement. As with any intellectual property regime, the enforcement mechanism will be at least somewhat costly. If the property right is poorly drafted, or if it is well drafted but there are some vague or ambiguous provisions nonetheless, expensive litigation to determine the property right may result. But the original applicant will at least have an incentive to draft sufficiently clearly to avoid expensive litigation. To reduce the danger that this intellectual property regime might impose costs on innocent third parties, it might be appropriate in the initial experiment to impose a one-way fee shifting rule, requiring the rights holder to pay the attorney's fees of the other party if that party prevails.

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If, on the other hand, a third party rejects the property right, then no property right would be granted. The fate of the deposits would then depend on whether the market experiment occurs nonetheless in the specified time frame. If the market experiment does occur, then the deposits would be awarded to the third party; if it does not, then they would be awarded to the original applicant. Once again, there may be difficult questions of interpretation, though the original applicant will have an incentive to draft a clear application to reduce the possibility of litigation. A drawback is that any litigation may necessarily involve third parties, who could be required to answer subpoenas about the extent of their business practices. This spillover cost too could be reduced, for example by requiring compensation of the third parties for their time, and placing any trade secrets produced during the litigation under seal.

The basic intuition behind the system is simple. If there is even a small probability (given the deposits suggested above, 1 in 10) that the market experimentation described will occur over the time frame, then a third party will have an incentive to tender a deposit and reject an application, in effect entering into a bet with the property rights applicant. Anticipating this, the prospective entrepreneur will not apply in the first place. There is a danger that third parties sometimes might reject applicants without adequate warrant, but that is by design, because we are more concerned in this initial implementation of this system with avoiding false positives (inefficient grants of rights) than false negatives (inefficient rejections of rights). If no third party is willing to tender a deposit on such attractive terms, that provides a strong indication that no market experiment is likely to take place in the absence of an intellectual property right. Given the stakes, some private parties would presumably go into the business of evaluating applications, so there should be no shortage of potential challengers. When a right is granted,

there is thus little risk that it will merely be enhancing the profits of an entrepreneur who would have entered the market in any event.

After a third party rejects an application by tendering a deposit, both the original entrepreneur and the third-party challenger remain free themselves to initiate the market experiment. These rules will make seeking an application somewhat less attractive, further reducing the costs of false positives. When the original entrepreneur engages in the market experimentation despite a rejection, the bonding system has worked effectively. In this case, the entrepreneur did not really need the intellectual property incentive to create the market experimentation; the entrepreneur has entered the market even without a right and even though the entry would mean that the entrepreneur would forfeit the deposit to the third party. Meanwhile, the prospective entrepreneur's deposit serves as a subsidy to anyone else who might be considering entering the market. A third party that places a bet that the market experimentation will occur can be sure of winning that bet by entering. The regime thus has the potential to encourage market experimentation even in the case in which an application is rejected.

The incentive of a prospective entrepreneur is to draft the proposed property right as broadly as possible, but not so broadly that a third party will reject the application. For example, if our prospective restaurateur assesses the probability that someone will create an Ethiopian restaurant in Podunk at less than 0.10 over the next five years, but at more than 0.10 over the next six, then, with the above stakes, the restaurateur should limit the term of the property right to no more than about five years. The restaurateur also might limit the claim to a neighborhood of Podunk if it seems likely that an Ethiopian restaurant will open somewhere in Podunk in the relevant time period. Similarly, imagine the possibility that NetFlix had sought such a patent.

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Had it sought a right on all DVD-by-mail sales, someone surely would have taken up the challenge, because there was likely a high ex ante probability that at least a small business somewhere in the United States. So NetFlix might instead have limited its proposed property right by focusing on large businesses, for example those renting at least a million DVDs a year or those spending at least \$10 million a year on marketing.

In some instances, an entrepreneur might first try to obtain a broad property right, and failing that, apply again with narrower claims and a new deposit. An entrepreneur also might reapply with the same application, if the entrepreneur believes that the third party rejection was erroneous; the third party would then have to decide whether to continue to deny the application and bet that the market experiment will occur in any event. One advantage of the possibility of such repeated filing is that it decreases the chance that a third party will repeatedly reject an application for reasons other than seeking to obtain the entrepreneur's deposit. For example, the third party might worry that the entrepreneur's business model will challenge its own business model.

There is an argument, however, that such repeated filing should not be allowed, because even such third party challenges may be useful. A principal argument against promoting market experimentation considered above was that market experiments sometimes may provide more demand diversion than increase in social welfare. When this is so, encouraging businesses that are close substitutes of the proposed business method to reject the application may be beneficial. Restricting the number of applications that can be filed will discourage provision of intellectual property for market experimentation when success would be largely attributable to demand diversion. In an initial experiment, limiting repeated applications may therefore be sensible, reducing the risk of false positives, even if some third-party rejections represent attempts by

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entrenched providers of goods and services to entrench themselves. Should the result be that virtually all applications are rejected, then repeated applications might be permitted.

As described so far, the system still leaves one scenario that threatens to produce inefficient grant of rights. Suppose that it is highly unlikely that it will make sense for anyone to enter a market in the next ten years, but that there is a small chance (say, one in twenty) that demand conditions will change in a way that it may become obvious that entry would be advisable. If the market is sufficiently large, then it might be worthwhile to secure the intellectual property right just in case demand conditions evolve in this way. Warehousing of market experimentation intellectual property rights could mean that some rights will protect entry that might have occurred even in the absence of the issuance of the intellectual property right. This is not necessarily inefficient—perhaps entry will occur somewhat earlier as a result of the property right, and even in such cases the probability of entry may rise—but this is undesirable if the goal is to avoid false positives.

There is, however, a simple solution to this problem. The regime can be flipped so that a third party is also allowed to challenge a claim that entry will occur if the intellectual property right is granted. If no one rejects the application on the ground that entry would occur anyway, then a third party would be permitted to tender a deposit (once again, perhaps just \$1,000) predicting that entry will not occur despite the grant of the right. This action produces a choice for the applicant: First, the applicant can withdraw the application, in which case the deposits are awarded to the third party. Second, the applicant can tender another deposit (say, \$10,000 again) to keep the intellectual property right. When this occurs, the process can repeat recursively, with further third party challenges and further deposits. If, however, this process ends with an unchallenged deposit by the applicant, then the applicant receives the intellectual property right.

All challenges are then resolved based on whether the applicant in fact carries out the proposed market experiment.

Under this system, the probability that the applicant will follow through and perform the market experiment must be very high (at least about a 9 in 10 chance) if the applicant hopes to receive the intellectual property right. If the applicant does not seem very likely to follow through, there should be no shortage of third parties willing to challenge the applicant with such favorable odds. An applicant hoping simply to warehouse intellectual property rights in the unlikely that they should become useful would be unable to withstand these challenges. At some point, the total amount deposited will begin to approach the expected benefits of the intellectual property right, and the amount deposited will be lost if the market conditions do not change in ways that would make entry worthwhile. The challenges themselves, of course, provide additional incentive for the market experiment to take place, thus further promoting the goal of market experimentation. If those who genuinely wish to embark on risky experiments are subsidized by those who do not believe that they would be willing to take on such risk, so much the better.

B. Next Case Scenario: Improvements to the Bonding Mechanism

Our proposal entails little risk. It covers only proposed market experiments that are highly unlikely to be executed in the absence of protection, that are highly likely to be executed with protection, and that are unlikely to be strong substitutes for other goods and services and thus constitute potentially welfare-reducing demand diversion. More traditional approaches to intellectual property reform cannot make such promises, because no matter what legal standard applies, there are empirical uncertainties about how administrative officials will interpret the standard. If our proposal is to be criticized, it should be criticized for providing too little reward.

With the specifications that we have provided, perhaps too few market experiments will be covered.

The easy answer is that the proposal can be adopted to cover the next best set of proposed market experiments. If the applicant need deposit only a smaller amount of money, or if third party challengers must deposit a higher amount, then a greater number of proposals will be accepted. One useful aspect of this decentralized system is that transitions can easily be controlled. A legislature (and the system could be implemented by a state legislature for local experiments as well as by a national legislature) need only change the applicable numbers. It need not merely choose among alternative vague verbal formulations. Depending on the experience with the initial proposal, it should be straightforward to change the approach so that some applications are accepted even when there is a nontrivial probability that intellectual property protection is not necessary or that intellectual property protection will be insufficient to prompt any actual experimentation. Empirical analysis to determine the optimal numbers will not be easy, and there will be some danger that the legislature will grant excessive protection. Our numerical examples in Part I suggest, however, that even aggressive grants of intellectual property protection for market experimentation, causing significant deadweight loss, may increase social welfare.

Experience might also lead to development of structurally different approaches to decentralized assessment of the need for intellectual property protection. One possibility is that conditional prediction markets might be used to assess the probability that entry will occur with and without the grant of intellectual property protection. A burgeoning literature shows that prediction markets can serve as useful tools for making probabilistic assessments and that such markets may not be easily manipulated by private parties. Other market mechanisms, such as

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Michael Kremer's proposed auctions to facilitate government buyouts of intellectual property rights, also plausibly might be combined with our system, so that the government would be subsidizing market experimentation with dollars instead of with exclusive rights. Assessment of prediction markets and Kremer's proposal are beyond our scope, but we do not mean with our proposal to commit ourselves to a particular means of effecting a decentralized approach to the issuance of intellectual property rights for market experimentation. We seek to illustrate the feasibility of such a system, not in this paper to identify the optimal system.

IV. CONCLUSION

[To be added]