

A NAASTy alternative to RAND pricing commitments

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Abstract

Voluntary standard setting organizations (SSOs) typically require participants to disclose their patents during the standard-setting process, and will endorse a standard only if patent holders commit to license them on “reasonable and non-discriminatory” or RAND terms. We argue that this policy is unworkable—the RAND standard is ambiguous and thus extremely hard to adjudicate. As an alternative, we propose a policy of Non-Assertion After Specified Time, or NAAST pricing. Under NAAST, technology vendors commit not to assert their patent after some previous specified time, but would be free to collect royalties as they wish up until that point. Under our proposal, technology producers would be compensated, vendors would have quick and eventually free access to standards and a large element of uncertainty due to litigation would be eliminated.

1. Introduction

Voluntary standard setting organizations (SSOs) are an important venue for achieving compatibility and inter-operability in information technology markets. A widely recognized problem for SSOs is the treatment of intellectual property rights. When an SSO promulgates a standard that turns out to utilize proprietary technology, it can leave the market in a precarious position and possibly damage the SSO's reputation. Consequently, most SSOs require participants to disclose patents during the standard-setting process, and many will only endorse a standard if patent holders commit to a licensing regime for their intellectual property (IP). By far, the most common licensing regime in use is Reasonable and Non-Discriminatory (RAND) pricing.

This paper argues that RAND commitments are not a workable solution to SSOs' intellectual property problem. The central problem with RAND policies is that they fail to clearly define a "reasonable" price. In practice, IP holders may offer RAND pricing commitments with the belief that this commitment is so vague and ill-defined that it is in fact vacuous.¹ Economists typically suggest that a reasonable price should reflect the ex ante benefits of adopting a particular technology as the industry standard, but not the additional switching and coordination costs created by the standard-setting process (e.g. Swanson & Baumol 2005; Layne-Farrar, Padilla & Scmalensee 2007; Farrell, Hayes, Schapiro & Sullivan 2007). However, economists' proposals rarely specify how one might calculate a reasonable price after investments are sunk, or in settings with significant complementarities among component technologies. And courts have provided little guidance or clarification on this matter.²

¹ *Broadcom Corp. vs. Qualcomm Inc.* Civ. A No. 05-3350(MLC) (D.N.J), Memorandum in Support of Defendant's Motion to Dismiss (filed Dec. 12, 2005).

² Plaintiffs in *Nokia Inc. vs. Qualcomm Inc.* Civ. A. No. 2330-N (Delaware), *Research in Motion Limited, et al vs Motorola Inc.* Civ. No. 08-cv-0037 (Dallas), and *Broadcom Corp. vs. Qualcomm Inc.*, Civ. A No. 05-3350(MLC) (D.N.J) alleged unreasonable pricing, but there has been no ruling on the matter, since all three cases ultimately settled out of court. The closest any US court has come to providing guidance on the definition of RAND was when the Court of Appeals for the Third Circuit noted that the fifteen *Georgia Pacific* factors have been used to calculate damages based on reasonable royalty rates in patent infringement cases.

The cost of this uncertainty is potentially very large. Simcoe, Graham, & Feldman (2009) show that patents disclosed to SSOs have a very high rate of litigation. Beyond the obvious costs and delays associated with litigation, IP holders may hesitate to embed their technology in a voluntary standard. And vendors may hesitate to implement such a standard when costs are unclear and litigation likely.

This paper proposes an alternative to RAND pricing. The central idea is that firms within an SSO could agree not to assert essential patent claims after a specified period of time. Under this policy, technology producers would be compensated, vendors would have access to standards and a large source of uncertainty due to litigation would be eliminated. To help this policy compete with RAND, we give it a similarly simple acronym: NAAST, which stands for Non-Assertion After Specified Time.

A firm that commits to NAAST would give up the right to assert its patent after a period of time specified by the SSO, for example, five years. Until that time, the IP holder would be free to license the patent at whatever rates it could collect. NAASTy pricing (obviously, the prices that adhere to NAAST are “NAASTy”) does not imply substantial delays in standards implementation. Rather, IP holders will have an incentive to license their technology quickly with the threat of a non-assertion period growing closer. If vendors are willing to pay to be among the first producers in a market, then patent owners will obtain reasonable returns on their investment in a short period of time. Finally, NAAST has the great benefit of being straightforward to adjudicate since it does not specify prices, only dates. Thus, NAAST mimics the underlying patent system by granting a limited time monopoly to technology developers. However, this assertion period could be significantly shorter than the twenty-year life of a typical patent.

Naturally, NAAST is not perfect. In particular, it explicitly allows for super-competitive prices during the assertion period. In principle, RAND eliminates these inefficiencies by achieving reasonable prices right from the start. But in practice, RAND often fails to live up to this promise. There are real social costs in moving from a world in which technology and market presence is distributed across a number of firms to one in which

many firms participate on the platform of a single compatible standard.³ RAND arguably ignores these costs, whereas NAAST incorporates them in the form of an explicit payout period to IP holders. As a result, NAAST is more likely to provide a workable approach.

This paper argues for NAAST in three steps. Section 2 describes the IP dilemma that has led most SSOs to adopt some variation of the RAND licensing policy. Section 3 examines efforts by the government to adjudicate “reasonable” prices in several other domains; in each case, such attempts have either met with failure or been so obviously difficult as to have never been attempted in the first place. Section 4 describes the NAAST policy, explains how it addresses the fundamental problem with RAND, and discusses some of the issues that might arise in implementing such a policy. Section 5 concludes. While the paper evaluates RAND and NAAST policies in the context of U.S. legal institutions and case history, the main arguments are fairly general, and should apply equally to European or global standards developing organizations.

2. Standards, intellectual property and hold-up

Voluntary standard setting organizations facilitate industry coordination on a common technological platform. Initially, they serve as a forum where industry participants perform collaborative research and discuss the merits of alternative technologies. The goal is to identify the best available solution to a given problem. Ultimately, SSOs choose a particular technology and issue a formal endorsement. This certification is meant to signal the end of deliberations and promote industry-wide investments in the new technology.⁴

Difficulties arise when investments in a new standard are sunk (i.e. irreversible or technology-specific), leading to what economists call a hold-up problem.⁵ Technology-

³ Greenstein & Rysman (2007) discuss explicit and implicit costs of standard setting in the context of 56K modems.

⁴ David & Greenstein (1990) and Shapiro & Varian (1998) describe the economic and business strategy issues associated with the formal standards process. Rysman & Simcoe (2008) provide some empirical evidence that SSO endorsements have an impact on the value of the underlying technology.

⁵ Williamson (1985) introduced the hold-up problem, which he called the “fundamental transformation.” Farrell, Pil-Choi, Edlin, Greenstein, Hall & Saloner (2004) provide a detailed discussion of hold-up problems in this context.

specific investments can make a technology cheaper to deploy—on a forward-looking basis—than alternatives that were a perfect substitute before standardization. Thus, when the technology in a standard turns out to be patented, the IP holder can charge royalties up to the difference in implementation costs before vendors will switch, even when the ex ante cost structure of two technologies was identical. Thus, a patent that is worthless prior to standardization—given the existence of a perfect substitute—may become quite valuable if the SSO endorsement leads to substantial technology-specific investments.⁶

Given the potential for hold-up, why do firms fail to conduct a comprehensive patent search before implementing a new standard? One reason is large search costs. SSO participants balk at the potential cost of conducting an essential patent search for each new standard, and these search costs would presumably be larger for outside firms. In information technology markets, the existence of patent thickets (large numbers of independently held patents with overlapping claims) may also make the transactions costs of securing independent licenses prohibitive. Moreover, firms may hesitate to sign licenses when there is substantial uncertainty over a patent's validity. This uncertainty is amplified by long lags in the PTO review process, and the fact that some applications are filed during or after SSO deliberations. Finally, there is probably some inertia. Many large IT vendors are simply accustomed to implementing new standards, secure in the knowledge that they have already signed comprehensive cross-licensing arrangements with the other major industry players.

If SSOs or their members are forward-looking, why do they fail to anticipate the hold-up problem, and work to prevent it? One natural solution would be to negotiate royalty payments with any prospective licensors ex ante—before technology-specific investments make potential substitutes less attractive. This is essentially the mechanism proposed by Swanson & Baumol (2005), Layne-Farrar et al. (2007) and Farrell et al. (2007) for determining a reasonable price, and SSOs have taken a number of steps in this direction. For example, most SSOs require their members to disclose any patents they

⁶ Of course, this argument depends critically on the assumption that the patent is valid and enforceable. However, under current patent law, the threat of injunction provides even “weak” patent owners with power in the bargaining process. Farrell & Shapiro (2008) discuss the implications of weak patents.

believe might be essential to implement a standard (though few require a comprehensive search).⁷ RAND licensing requirements can also be viewed as an attempt to mitigate hold-up concerns by providing ex ante assurance that prices reached through ex post negotiation will be reasonable.

There are at least two potential weaknesses with ex ante licensing negotiations. The first one is widely recognized: SSO's explicitly consider competing technologies and so price setting by SSO participants raises the specter of antitrust law, particularly charges of collusion. The second one draws less attention: considering pricing requires a change of culture and organization of SSOs, and may distract SSOs from their primary goal of developing technical standards.

With regards to the first concern, are the SSOs' antitrust fears justified? There is in fact gathering support to have SSOs negotiate licensing fees simultaneously with determining a standard (Lemley, 2007; Majoras, 2005). US antitrust authorities have embraced such a policy generally (U.S. Department of Justice & Federal Trade Commission, 2007) and the US Department of Justice has issued Business Review Letters that endorse a policy of ex ante price disclosure at VITA (an SSO that promotes the VMEbus computer architecture) and the IEEE.⁸ The VITA policy requires IP holders to commit to a "price cap" (i.e. a maximum royalty rate and most restrictive set of licensing terms), which can be amended downwards, while the IEEE policy allows firms to disclose their most restrictive licensing terms on a voluntary basis. Both policies continue to forbid direct negotiations over prices within the SSO.

Why do SSOs remain hesitant to allow ex ante negotiations? While Business Review Letters insulate SSOs against public lawsuits, there would no doubt be private antitrust suits in this context, and it remains to be seen whether courts will view ex ante rate setting as legal. For example, Golden Bridge sued the 3GPP SSO for facilitating

⁷ Lemley (2002) provides a summary of the IP policies adopted by a number of SSOs. Simcoe (2006) documents a steady increase in the number of intellectual property disclosures to SSOs starting around 1995, and considers several possible explanations for this trend.

⁸ These letters can be retrieved from <http://www.usdoj.gov/atr/public/busreview/219380.htm> and <http://www.justice.gov/atr/public/busreview/222978.htm> (accessed on October 19, 2010).

collusion after the firm disclosed a patent and began negotiating license agreements, only to find that 3GPP members rewrote the standard so as not to infringe Golden Bridge's patents. Claims of monopsony and group boycotts by SSO members were also litigated in *Sony Electronics vs. Soundview Technologies* and *Addamax vs. Open Source Software Foundation*.⁹ Farrell et al. (2007) suggest that the economic merits of these claims are weak: the damage to innovation incentives from collective negotiations are no greater than when the innovator must negotiate with a single large user. Nevertheless, SSOs are understandably reluctant to incur the risk of litigation. These issues could be resolved by the Supreme Court or through legislation, but that would likely take considerable time.

With regards to the second concern, standards are typically developed by engineers who lack the training and authority to consider pricing issues. While business executives are certainly involved from time to time, some practitioners suggest that explicit SSO involvement in pricing decisions would require substantial changes in the ways that SSOs work and in who attends. Such change would be costly and difficult, and not particularly welcome by many SSO participants. While it is difficult to say how important these issues would be in practice, they certainly merit careful consideration.

Given SSOs reluctance to allow explicit ex ante negotiation, and firms' inability or unwillingness to negotiate independent licenses, the dominant policy has become vague RAND promises followed by ex post negotiation and dispute resolution. Unfortunately, this policy ignores the practical difficulties of adjudicating the RAND standard.

3. Administering reasonable prices

In order for a RAND promise to be credible, there must be some method for the government to resolve the inevitable disputes. This, in turn, requires a definition of RAND and a method for adjudication. This section proposes one (reasonable?) definition of RAND, and examines several attempts to enforce RAND-type prices through government action in contexts other than standard setting.

⁹ *Golden Bridge, Inc. vs. Nokia, Inc.*, 416 F. Supp. 2d 525, 528 (E.D. Tex. 2006). *Sony Electronics Inc. vs. Soundview Technologies, Inc.*, 157 F. Supp. 2d 180, 185 (D. Conn 2001). *Addamax Corp. vs. Open Source Software Found.*, 888 F. Supp. 274, 278 (1995).

What is meant by RAND? SSOs rarely offer an explicit definition.¹⁰ Practitioners often point to procedural implications of a RAND commitment, such as waiving the right to offer an exclusive license, seek injunctive relief or sell the patent to a third-party licensor.¹¹ This paper focuses on the implications for pricing. The “non-discriminatory” part is seemingly straightforward: firms cannot charge different prices to different consumers. In practice, the issue becomes more complex if a patent-holder is vertically integrated, offers volume discounts (e.g. via two-part tariffs) or bundles essential patents into a cross-license. Formally, price differences might be justified if costs varied across different groups of consumers. And there is a question of how non-discriminatory prices might be enforced when contracts are not observed by most market participants. Nevertheless, there seems to be a broad understanding that “non discriminatory” pricing implies an obligation to offer licenses and to refrain from seeking injunctive relief.

More controversial is the definition of reasonableness. We take a reasonable price to be one that is just high enough to guarantee a patent holder a reasonable profit (zero economic profit) on their research investments and no higher.¹² In the short-run, the efficient price for a license is often zero since there is no cost in distributing an idea. However, imposing this price has a clear cost in terms of dynamic efficiency since it eliminates the incentive to produce new inventions and participate in the standard-setting process. The zero economic profit criteria implies that short-run prices will exceed marginal cost, so that patent-holders realize an appropriate risk-adjusted return on their

¹⁰ According to the American National Standards Institute, “the determination of specific license terms and conditions, and the evaluation of whether such license terms and conditions are reasonable and demonstrably free of unfair discrimination... should be determined only by the prospective parties to each license or, if necessary, by an appeal challenging whether compliance with the Patent Policy has been achieved.” (ANSI 2011)

¹¹ For a practitioner’s overview of RAND, see Treacy & Lawrance (2008). A possible exception to the waiver of a right to injunctive relief under RAND occurs when an infringer fails to enter good-faith negotiations (see a ruling by the German Federal Supreme Court regarding the “Orange Book” standard for CD-ROMS, docket number KZR 39/06). The US Federal Trade Commission brought a Section 5 “unfair methods of competition” case against Negotiated Data Solutions for attempting to license a patent that originally had been disclosed to the IEEE under RAND terms by the original patent-holder, National Semiconductor (*In the Matter of Negotiated Data Solutions, LLC*, FTC File No. 051-0094).

¹² This definition does not consider productive efficiency, i.e. the possibility that it would be less costly to have more firms produce smaller quantities of a product. Thus, our definition of a reasonable price takes the existing productive structure as given.

investment in R&D, but do not capture the rents produced by implementers' sunk investments or coordination costs.¹³

Fairness is another criteria one might use to evaluate prices. In fact, the European Telecommunication Standards Institute explicitly refers to “fair, reasonable and non-discriminatory” (FRAND) pricing commitments. Unfortunately, it is extremely difficult to define fairness in a way that would give clear guidance for judging prices in a complicated situation. Furthermore, the concept of fairness has little role in the “law and economics” movement that underlies the modern treatment of antitrust and patent law, which instead focuses on efficiency. Given that many writers seem to treat FRAND and RAND as synonyms, this paper takes the “fairness” criteria as too vague to give clear guidance and focuses on the narrower problem of reasonable price determination.

While the main goal of RAND policies is arguably to achieve economically reasonable prices, no SSO provides a clear method for computing such a prices. Thus it will fall to courts to determine when prices are reasonable, and this will form the legal backdrop under which firms negotiate licenses. Can one look to other areas where the government in one form or another successfully computed and enforced reasonable (or efficient) prices? There is little cause for optimism.

As a first example, take the broad field of economic regulation. A pillar of economic regulation in the United States is the Supreme Court case *Smyth vs. Ames* which establishes that:

“The basis for all calculation as to the reasonableness of rates ... must be the fair value of the property being used. ... The company is entitled to ask for a fair return upon the value of that which it employs for the public convenience ... while the public is entitled

¹³ One practical drawback of this definition, which rests on the notion of expected profitability, is that courts can rarely examine the distribution of R&D investments for a sufficiently large sample of comparable projects to precisely estimate the costs against which a reasonable profits criterion would apply. Of course, this strengthens our argument for a move away from efforts to adjudicate a reasonable price standard.

to demand ... that no more be extracted from it ... than the services are reasonably worth.”¹⁴

The definition of a reasonable price envisioned by the *Smyth* Supreme Court is very close to that described above in the context of SSO's. But the result has been what most observers consider to be a great failure. A truly vast literature documents the inability of various government agencies to hold prices down to a level that just compensates producers (for sake of a citation, see Viscusi, Harrington & Vernon, 2005), ultimately leading to the broad deregulation movement of the last few decades.¹⁵ To be sure, many of the failures of regulation are associated not just with high prices, but also with cost control and the development of new technologies. But high prices have certainly been an issue. Moreover, economic regulation is typically implemented in the context of a largely homogenous good (such as electricity) by a large state run administration (such as a Public Utilities Commission) that presumably can establish great expertise over a substantial amount of time. These institutions and resources contrast favorably with a judge in an IP case trying to establish a reasonable price for a component of a new product relying on novel and unfamiliar technology. If a PUC cannot properly implement reasonable prices for utilities, how can a judge do so for information technology?

A second area where reasonable prices have sometimes been discussed is in the treatment of collusion cases under antitrust law. Although the Sherman Act of 1890 outlaws all restraints of trade, the courts have long held that reasonable restraints of trade are not outlawed and have even included some horizontal agreements under this protection, such as sports leagues. Defendants in collusion cases have often attempted to extend this protection to prices that are reasonable. That is, a collusive group will argue that they should not be found guilty even though they colluded because they picked a price that, for instance, was just high enough to protect them from ruinous competition. But the courts have repeatedly rejected this defense. One reason is that courts have recognized how difficult it would be to judge the reasonableness of prices. In *Addyston Pipe and*

¹⁴ *Smyth vs. Ames*, 169 US 466 (1898).

¹⁵ This is not to say that it is impossible to find some example of arguably successful (F)RAND-style price regulation in some country and/or industry. Our point is that these policies often fail, even in settings that are far more favorable than setting royalties for component technologies in high technology markets.

Steel, the court rejected an argument that prices were reasonable because the judge “rejected the notion that the Court has the responsibility to determine economic reasonableness, because it would lead in his view to a vague and indeterminate standard.” (Hylton, 2003, p. 100). Famously, the court warned that judges who engage in determinations of reasonableness “set sail on a sea of doubt.”¹⁶

A third area where reasonable prices might be useful is in the patent system. The justification for the patent system rests on the recognition that some ideas are easy to steal and yet are crucial to economic growth. Therefore, a successful society must find a way to reward inventors. One approach would be for an omniscient policy maker to evaluate each new invention and reward inventors with a prize that reflected the cost of invention and associated risks. The policy maker would then distribute the idea freely to the rest of society. A budget constrained social-planner might choose to assign a price at which ideas could be licensed from the inventor rather than giving them away for free. This price would be just high enough to reward the inventor’s investment. In other words, the social planner would pick a reasonable price in exactly the sense described above.

Obviously, this is not what happens at all. No such system has been seriously considered in policy circles.¹⁷ The patent system provides a simple alternative: give the inventor monopoly rights for a specified amount of time, and no rights thereafter. This system implicitly assumes that the inefficiencies of government rate setting would exceed the inefficiencies of limited-time monopoly.

One area where courts do actively set rates is when they must compute damages following a case of patent infringement. In *Georgia Pacific*, the court laid out fifteen criteria for determining a reasonable royalty rate.¹⁸ This is arguably a counter example to the argument that government agencies are generally unable to compute a reasonable

¹⁶ *United States vs. Addyston Pipe and Steel Co.*, 85 Fed 284 (1899).

¹⁷ Scotchmer (2004, p. 40) describes problems associated with “blue sky” prize mechanisms, which include establishing the credibility of the prize sponsor and determining the value of the innovation.

price.¹⁹ However, application of the *Georgia Pacific* factors often yields far from satisfactory results. For example, Lemley & Shapiro (2007) provide a detailed discussion and some empirical work on how the court-awarded damages diverge from what we might think are reasonable rates. In particular, courts typically proceed by reviewing rates on similar patents, but these rates are negotiated with litigation as an alternative in the case of failure, which leads to higher overall prices. They suggest that the problem can be especially severe for component technologies. Overall, the realized rates in court proceedings seem much higher than what we observe in the marketplace, suggesting that when it comes to effectively adjudicating reasonable prices, the *Georgia Pacific* factors are actually the exception that proves the rule.

To summarize, this section reviews three areas where administering reasonable rates would be valuable.²⁰ In one case (utility regulation) it was tried unsuccessfully, in another (antitrust law) it was suggested but rejected for being unworkable and in the final case (patents) it was never seriously considered. While the preceding discussion of reasonable price determination is exceedingly brief and simplistic, it hopefully raises the following question in readers' minds: What is an example of successful government administered reasonable rates? Evidence from various settings suggests that systems based on unspecified reasonable rates (such as RAND pricing commitments) will lead to a great deal of litigation with little hope of a useful concrete formula for going forward.

With these cautionary tales in mind, one should be skeptical of proposals to reform the patent or standard setting system but still rely on RAND pricing commitments. For instance, several proposals focus on raising the quality of patents by improving the examination process or through setting up the opportunity to challenge a patent

¹⁹ An alternative definition of a reasonable licensing fee to ours might be the fee the patent would have received under licensing in the absence of a standard. This definition may often diverge from what economists normally mean by reasonableness, but it may be easier to implement. However, we still view it as unworkable. This definition arguably provides the rationale for the *Georgia Pacific* rules (the fees the patent would have received in the absence of infringement) but these rules have still garnered significant criticism.

²⁰ Another highly contentious application of the reasonableness standard is when setting intra-company transfer prices for international tax accounting. While this example provides further support for the view that it is extremely hard to adjudicate reasonable prices, it was omitted here for brevity.

immediately upon grant in an efficient administrative court (e.g. Bessen & Meurer 2009). While raising the quality of patents should mitigate some problems that arise when SSOs standardize a patented technology, it will not eliminate the practical difficulties of determining a RAND price. This suggests that it would be useful to consider alternative policies that move SSOs away from RAND commitments altogether.

4. Non-assertion after specified time (NAAST)

The previous section argued that the problem of setting reasonable prices for patents in standards is similar to the broader problem of setting reasonable prices for patents. The patent system's solution to the more general problem is to abandon the notion of reasonable price determination and simply grant the patent-holder a temporary monopoly. Should this approach be extended to SSOs? That is the idea behind NAAST.

Under a NAAST policy, SSO participants would commit not to assert their patents after some period of time specified by the SSO. Firms would have until that time to collect as much royalty as possible on whatever IP they hold over a standard. After that time, users of the standard would know that they will not face an infringement suit based on a disclosed patent. This approach mimics the underlying patent system, which rewards inventors with monopoly rights for a limited time. While the patent system receives a great deal of criticism, one feature that goes largely without criticism is its limited-time monopoly feature.²¹

The major virtue of NAAST pricing relative to RAND is that NAAST is much easier to adjudicate. Courts need to determine whether an assertion date has passed, not whether a royalty rate is reasonable. NAAST has a virtue relative to ex ante licensing as well, which is that it allows SSOs to take a very hands-off approach to pricing. Transaction costs would also be lower under a NAAST policy, since non-assertion covenants are self-executing, whereas the RAND policy requires each potential implementer to secure a license with every essential patent holder. Of course there are a number of important

²¹ See Jaffe & Lerner (2004) for an overview of the vast literature critiquing patent policy.

issues that will need to be addressed in any actual implementation of a NAAST policy. The remainder of this section considers several of these questions.

One obvious question about NAAST is the length of the assertion period. This paper does not take a position on what the time period should be. However, one might reasonably expect SSOs to choose a period that lasts several years, but is substantially less than the duration of the underlying patents. Possibly, technology contributors could propose time periods along with their standards. However, this would bring up questions about collusion that are similar to those surrounding *ex ante* price negotiation. More realistically, an SSO could set a uniform time period that applied to all of its standards.

In practice, how might SSOs identify a reasonable assertion period? The economic literature on optimal patent duration provides some guidance on this question. For example, in Gallini (1992) the optimal patent life is short enough that rivals choose to wait for expiration rather than invent around a patent. More generally, broad but short-lived patents will be desirable when demand for the patented good and its close substitutes is highly elastic (Scotchmer 2004, p. 111) or in especially fertile fields of technology where innovation is rapid and highly cumulative (Hopenhayn & Mitchell 2001). These models suggest that the NAASTy idea of contracting around the current one-size-fits-all patent-life may be especially useful in the ICT sector, where product life-cycles are short (relative to, say, pharmaceuticals), the costs of inventing around a patent can be low, and innovation is highly cumulative.

A second consideration in choosing the length of the non-assertion period is the tradeoff between serving the needs of consumers and technology producers. As SSOs jockey for jurisdiction, they discipline each other to find a middle ground between these needs.²² Assertion periods would be an element of this competition. Hopefully, this process would lead SSOs to pick a reasonable length of time (where, once again, reasonable implies a length of time that appropriately compensates inventors). A key advantage of NAAST is that this length of time would be easy to observe and compare across SSOs. In this sense,

²² Lerner & Tirole (2006) provide a model along these lines.

it could be finely disciplined by market forces, whereas requiring RAND pricing commitments can be disciplined only crudely.

In addition to selecting the duration of the licensing period, SSOs using a NAAST policy would need to specify a starting date. Two obvious candidates are the beginning and end of the standard-setting process. If this period begins at the start of the standard-setting process, IP holders will have an incentive to work quickly. This seems desirable, as several observers have suggested that IP owners' incentive to push their own technology leads to inefficient delays under the current system (e.g. Farrell & Simcoe, 2009). While prospective licensees might have an incentive to delay the standard-setting process under this policy, the advantage of being the first vendor in a new market might cause individual firms to defect from any collective effort at stalling. The alternative is to begin the non-assertion countdown when the SSO endorses a particular solution. In this case, the vendors will be in a hurry to reach agreement while individual IP holders will be willing to hold out for the adoption of their own technology—a situation no different from most current SSOs.

In general, NAAST commitments should lead to quick implementation of standards after standards are finalized. Firms that hold intellectual property over a standard might group together (e.g. through patent pools) and auction off the right to gain early access to this technology. Because network markets often exhibit important first-mover advantages, the winner should be willing to pay a substantial amount in order to have the right to enter first. Such high payments should allow SSOs to keep the assertion period relatively short. While it is possible that high initial prices would increase the number of implementers who would rather risk an infringement lawsuit than voluntarily pay royalties, dropping the RAND standard simplifies the calculation of damages in such cases considerably. Finally, there may be some cases where no agreement can be reached, for instance because the natural first entrants are also competitors who each hold separate IP over the standard. In these cases, consumers may be left waiting until the beginning of the non-assertion period before firms implement a standard. But considering the lost opportunities

during this time suggests that these events should be very rare. Indeed, useful standards generate large gains from trade, which should lead to rapid agreements.

A third practical consideration in designing a NAAST policy is the legalities of the non-assertion promise. This seems like a minor issue. Unilateral non-assertion covenants have been used for some time.²³ Several SSOs, including the IEEE and IETF, have standardized patent disclosure forms that allow firms to indicate a non-assertion commitment. Moreover, at least one prominent SSO (OASIS) allows new technical committees to choose their intellectual property regime at formation, with multi-lateral non-assertion covenants as one option. The only difference between that policy and NAAST is the addition of an initial time-period when IPR holders would be allowed to seek royalties for their inventions.

A fourth potential objection to NAAST is that it does not prevent companies from acquiring new patents that build on their essential patents already incorporated in a standard, thereby extending the period when they can exert market power. By definition, these new patents cannot be technically essential to the standard, which would itself constitute prior art. However, firms often refer to patents that cover popular enhancements or upgrades to a standard as “commercially essential.” While NAAST does not address this issue, neither do RAND policies, which only apply to technically essential patents. Thus, the only way that NAAST might exacerbate conflicts over commercially essential patents is by encouraging firms to include more technically essential patents in standards, thereby opening the door to more commercially essential extensions.

A final objection to NAAST is that it does not guarantee a standard will be completely free of any claims by IP holders. In particular, firms that do not participate in an SSO are under no obligation to disclose their patents or adhere to a set of licensing restrictions. Indeed, a strict NAAST policy may even cause some firms to stay away from the formal

²³ See, for example, “The Spread of the Non-Assertion Covenant” by Andrew Updegrave, *The Standards Blog*, June 15, 2006 (retrieved from www.consortiuminfo.org, October 19, 2010).

standard setting process. These are legitimate concerns, especially if there are ways for an IP holder to ensure that their patent applications remain secret, as with so-called submarine applications.²⁴ However, NAAST is no worse than RAND in this regard. In particular, RAND policies do not apply to firms that never belong to an SSO. And, under the definition of reasonable prices described above, only firms that believe their RAND commitments to be meaningless would choose to exit an SSO that switched from RAND to NAAST.

Overall, NAAST is similar to RAND in that both allow technology producers to recoup their investment and both should lead to quick diffusion of a standard. But NAAST has one overwhelming advantage: it is straightforward to adjudicate. This not only reduces litigation costs, but also has the pro-competitive benefit of encouraging firms to invest in technologies that can be contributed to the standard setting process.

A comparison between NAAST and ex ante negotiation is less clear. In theory, ex ante negotiations allow the owner of the best technology to appropriate precisely the surplus produced by their invention (relative to the next best option), where NAAST allows them to capture some super-competitive profits. However, SSOs have been very reluctant to open the door to antitrust scrutiny by allowing these negotiations to take place.²⁵ Moreover, the simplicity of a NAAST rule may free the engineers who typically evaluate technologies within an SSO from the burden of ongoing royalty negotiations. To be clear, ex ante negotiations represent one promising solution to the ambiguities associated of RAND. However, this paper proposes a different approach that may be easier to implement and adjudicate.

5. Conclusions

This paper began by describing a dilemma faced by groups that create compatibility standards: using patented technologies in industry standards requires some assurance for implementers, who reasonably fear that IP owners will set very high prices once

²⁴ Such behavior was at issue in *FTC vs. Rambus* (FTC Docket No. 9302).

²⁵ Ex ante policies also require timely disclosure, but lack a mechanism to prevent patent holders from declaring an unreasonably high maximum royalty rate just before a standard is adopted.

implementers are locked into the standard. Currently, SSOs address this problem by asking members to commit to license their technology on reasonable and non-discriminatory (RAND) terms. But these RAND commitments do not solve the problem, since they fail to clearly define what is meant by a reasonable price. Uncertainty over RAND pricing leads to litigation, which is costly in terms of time, fees and dissuading future investment in standards-related innovation. A review of government rate-setting in other economic environments suggests that there is little hope that RAND can be adjudicated in an effective way.

As an alternative to RAND, this paper proposes that firms within an SSO could agree not to assert their essential patents after a specified period of time. Prior to the arrival of this non-assertion date, firms would remain free to exercise the legal monopoly power granted by the patent. This NAAST policy (or what might be referred to as “NAASTy pricing”) mimics the incentives provided by the broader patent system, which does not try to establish a reasonable price for each invention, but rather grants each inventor a monopoly of limited duration. NAAST has the great benefit of being straightforward to adjudicate. Under NAAST, technology producers would be compensated, vendors would have timely access to standards and a large source of uncertainty due to litigation would be eliminated.

Ultimately, NAAST does leave society with a price to pay, which is the period of monopoly profits that precedes the non-assertion date. However, this cost is analogous to what policy-makers have chosen in the more general context of patents, where limited-time monopolies are preferred to government administered licensing fees as a way to reward innovators. SSOs should view the cost of limited-time monopolies as the legitimate cost of persuading technology firms to develop and contribute standards-related technologies. In this sense, NAAST seems far superior to RAND, since NAAST recognizes this cost in an explicit way. While NAAST commitments leave many problems with standard-setting unsolved, this paper argues that NAAST does no worse than RAND in any areas and does substantially better in several important ones.

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