

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 only endorse a standard 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 inherently ambiguous and thus extremely hard to adjudicate. As an alternative, we propose a policy of Non-Assertion After Specified Time, or NAAST pricing. Under our proposal, technology producers would be compensated, vendors would have access to standards and uncertainty due to litigation would be largely 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 license their intellectual property (IP) on "reasonable and non-discriminatory" or RAND terms.

In this paper, we argue that RAND commitments are not a workable solution to SSOs' intellectual property problem. Ironically, the problem is that RAND is not a standard. The concept of "reasonable" pricing has no clear meaning: Is RAND a commitment not to seek an injunction against the use of a technology? Is it a commitment to accept a certain percentage of the final good's price, or a commitment that all patents incorporated in the product will split a certain percentage? How should a RAND price be set? In some cases, it seems that IP holders make RAND pricing commitments with the belief that the commitment is so vague and ill-defined that it is in fact vacuous.¹

While the meaning of RAND is currently the subject of litigation, it is hard to imagine this will yield a definitive answer.² The cost of this uncertainty is potentially very large. 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. Under our proposal, technology producers would be compensated, vendors would have access to standards and uncertainty due to litigation would be largely eliminated. Since this proposal clearly

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 *Nokia Inc. vs. Qualcomm Inc.* Civ. A. No. 2330-N (Delaware).

needs a simple acronym to compete with RAND, we term it 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.

Naturally, NAAST is not perfect. In particular, we expect super-competitive prices during the assertion period (since NAAST mimics the structure of the underlying patent system). While RAND arguably eliminates these inefficiencies by achieving reasonable prices right from the start, we view this promise as unreachable. 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 While RAND ignores these costs, 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.

Our argument proceeds in three steps. First, we discuss the IP dilemma that has led most SSOs to adopt some variation of the RAND licensing policy. We then examine 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. Finally, we describe the NAASTy alternative, explain how it addresses the fundamental problem with RAND, and discuss some of the issues that might arise in implementing such a policy.

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

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 can 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-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

If SSOs or their members are forward-looking, why don't they 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. In fact, SSOs have taken a number of steps in this direction. Most SSOs require their members to disclose any patents they believe might be essential to implement a standard, and RAND licensing requirements

⁴ Rysman and Simcoe (2005) provide some evidence that these endorsements have an impact on the value of the underlying technology.

⁵ See Farrell et al (2004) for a detailed discussion of the hold-up problem in this context.

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 a very large stick in the bargaining process.

are an attempt to mitigate hold-up concerns.⁷ However, SSO's explicitly consider competing technologies and so price setting by SSO participants raises the specter of antitrust law. RAND commitments can be viewed as an attempt to provide some assurance that *ex post* prices will be "reasonable" while maintaining a strict prohibition on any discussion of the actual pricing.

Are the SSO's antitrust fears justified? Although the FTC and DOJ may be supportive of SSO rate setting, there would no doubt be private antitrust suits in this context. The issue could be resolved by the Supreme Court or through legislation, though this would likely take considerable time. Nevertheless, there is gathering support to have SSOs negotiate licensing fees simultaneously with determining a standard (Lemley, 2006; Majoras, 2005). The US Department of Justice recently issued a Business Review Letter that endorsed a policy proposed by VITA, an SSO that promotes the VMEbus computer architecture.⁸ This 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, but prohibits any actual negotiations. Although we take a somewhat different approach below, we are supportive of any developments that resolve the ambiguities associated with RAND.

As for individual firms, there are several reasons why they often fail to conduct a comprehensive patent search before implementing a new standard. In information technology markets, the existence of "patent thickets" (large numbers of independently held patents with overlapping claims) can 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 "systems" vendors are simply accustomed to implementing new standards, secure in the knowledge

⁷ Lemley (2002) provides a summary of the IP policies adopted by a number of SSOs.

⁸ The letter is available at <http://www.usdoj.gov/atr/public/busreview/219380.htm> (accessed on January 20, 2007).

that they have already signed comprehensive cross-licensing arrangements with the other major industry players.

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* dispute resolution.⁹ In the next section, we consider whether this model is sustainable. In particular, we focus on the problem of adjudicating a 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. After providing our own (reasonable?) definition, we examine several attempts to enforce RAND-type prices through government action in contexts other than standard setting.

What is meant by RAND? We take the “non-discriminatory” part as relatively straightforward. It means that firms cannot charge different prices to different consumers. Formally, prices differences might be justified if costs varied across different groups of consumers, but that seems relatively unimportant in the world of information technology. There is a separate question of how non-discriminatory prices might be enforced when contracts may not be observed by general market participants, but at least the definition is clear.

More controversial is the definition of reasonableness. It is relatively rare for a paper to take a clear position on this question. 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.¹⁰ In the short-run, the efficient price for a

⁹ Simcoe (2005) provides some evidence that the amount of IPR disclosed is on the rise.

¹⁰ We do not consider productive efficiency. That is, it may be more efficient for more firms to produce smaller quantities of a product but we do not consider this possibility. Rather, we imagine computing a reasonable price taking the existing productive structure as given.

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. Hence, we adopt a definition that properly rewards technology producers. It is not obvious that our definition of reasonableness is exactly what other writers have in mind when they use the term, but it is similarly not obvious that they mean something else. We find it to be the only rigorous definition for which everyone can easily agree upon its meaning.

Fairness is a third criteria we might use to evaluate prices. In fact, the European Telecommunication Standards Institute explicitly refers to “fair, reasonable and non-discriminatory” (FRAND) pricing commitments. However, we do not consider fairness here. 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 so many writers seem to treat FRAND and RAND as synonyms, we take the “fairness” criteria as too vague to give clear guidance.

So, we take the main goal of RAND to be achieving economically efficient prices. Since a clear method for computing RAND prices does not exist, it will fall to courts to determine when prices are efficient, and this will form the legal backdrop under which firms negotiate licenses. Can we look to other areas where the government in one form or another successfully computed and enforced reasonable (efficient) prices? We believe that the answer is no.

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 to demand ... that no more be extracted from it ... than the services are reasonably worth.¹¹

The definition of a reasonable price envisioned by the *Smyth* Supreme Court is very close to what we envision for 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 and Vernon, 2005). 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. The important point to focus on for our purposes is that 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 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 high technology. If a PUC cannot properly implement reasonable prices for utilities, how can a judge do so for IT?

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 the Sherman Act does not explicitly allow for this defense, even though the Sherman Act has been interpreted quite liberally

¹¹ *Smyth vs. Ames*, 169 US 466 (1898).

by the court. A second and arguably equally compelling reason is that courts have recognized how difficult it would be to judge the reasonableness of prices. In *Addyston Pipe and 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, pg 100). Famously, the court warned that judges who engage in determinations of reasonableness “set sail on a sea of doubt.”¹²

A third area where reasonable prices might be useful is in the patent system. Naturally, the justification for the patent system rests on the recognition that ideas are easy to steal and yet are crucial to economic growth. Therefore, a successful society must find a way to reward inventors. In a perfect world, an omniscient policy maker would evaluate each new invention and reward inventors with a prize that reflected the cost 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 the sense we have discussed so far in this paper.

Obviously, this is not what happens at all. In fact, no such system has been seriously considered. The government, our stand-in for the omniscient social planner, could never effectively set a reasonable price for each and every invention. The patent system provides a simple alternative: give the inventor monopoly rights for a specified amount of time, and no rights thereafter. Instead of living with the inefficiencies of government rate setting, we live with the inefficiencies of limited-time monopoly.

¹² *United States vs. Addyston Pipe and Steel Co.*, 85 Fed 284 (1899).

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. This is arguably a counter example to our line of reasoning—a case where the government actively administers a reasonable rate for patents. We view it as the exception that proves the rule, since the results seem to be far from satisfactory. Lemley and Shapiro (2006) provide a detailed discussion and some empirical work on how the court diverges from what we might think are reasonable rates. In particular, the court typically proceeds by reviewing rates on similar patents, but these rates are negotiated with litigation as an alternative in the case of failure! They show how this phenomenon leads to higher rates overall. In addition, the court seems to do a poor job with component technologies. Overall, the realized rates in court proceedings seem much higher than what we observe in the marketplace.

To summarize, we review three areas where administering reasonable rates would be valuable.¹³ 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 our discussion has been embarrassingly brief and simplistic, we hope to raise a question in the minds of readers: What is an example of a government administered reasonable rate that *has* been successful? Our view is that systems based on unspecified reasonable rates such as RAND pricing commitments will lead us into a great deal of litigation with little hope of a concrete formula for going forward.

With these cautionary tales in mind, we are skeptical of the value 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 immediately upon grant in an efficient

¹³ We also considered the reasonableness standard as applied to intra-company transfer pricing for international tax accounting. We only omitted this fourth, highly contentious, example for brevity.

administrative court. Raising the quality of patents should mitigate the problems with RAND pricing, but it will not make them go away. Rather, we are much more supportive of proposals that move us away from RAND pricing altogether.

4. Non-Assertion After Specified Time (NAAST)

In the previous section, we saw that the problem of setting reasonable prices for patents in standards is similar to the more general problem of establishing a reasonable price for a patent. In the latter case, this problem is “solved” by abandoning the idea of reasonable prices and granting the patent holder a temporary monopoly. Perhaps this would also work for 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 (a truly vast literature, but see Jaffe and Lerner, 2004 for discussion), one feature that goes largely unquestioned is its limited-time monopoly feature.

NAAST pricing has two major virtues. First, it allows SSOs to take a very hands-off approach to pricing—particularly relative to other *ex ante* proposals. This may not always be desirable, but we remain open to the suggestion that they have good reasons to be reluctant about allowing explicit *ex ante* negotiations.¹⁴ The second advantage of NAAST relative to RAND or *ex ante* negotiation is that it will be very easy to adjudicate. Of course there are a number of details that will need to

¹⁴ In particular, many observers fail to consider costs that *ex ante* negotiations may impose on the underlying engineering work that is at the heart of much SSO activity.

be fleshed out in any actual implementation of a NAAST policy. In the remainder of this section we consider several of these questions.

One obvious question about NAAST is how should the time period be set? We do not want to take a position on what the time period should be in this proposal. Possibly, technology contributors could propose time periods along with their standards. However, this would bring up similar questions about collusion that proposing licensing prices would. More realistically, an SSO could set a uniform time period that applied to all of their standards. Lerner and Tirole (2005) model SSO's as facing a tradeoff between serving the needs of consumers of standards and serving the needs of producers of technology that makes up standards. As SSOs jockey for jurisdiction, they discipline each other to find a middle ground between these needs. Hopefully, this process would lead SSOs to pick a reasonable length of time, and once again we use reasonable to mean a length of time that just compensates inventors. An advantage of our proposal is that this length of time is something that is easy to observe and compare across SSOs and can easily varied. In this sense, 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 and Simcoe, 2007). 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, we expect that NAAST commitments would lead to quick implementation of standards. Presumably, firms that hold intellectual property over a standard can group together to auction off the right to gain access to this intellectual property first. 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. 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. And in these cases, we 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, we expect to see agreements when the gains to trade are so high.

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 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 “submarine” applications. However, we note that NAAST is no worse than a RAND in these regards. RAND does not apply to firms that never belong to an SSO. And, under our definition of reasonable, 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 we believe 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 have been contributed to the standard setting process.

A comparison between NAAST and *ex ante* negotiation is less clear. In theory, *ex ante* negotiations will allow the owner of the best technology to appropriate precisely the surplus produced by their invention (relative to the next best option), where NAAST will allow 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. Moreover, the simplicity of a NAAST rule may free the engineers who typically evaluate technologies within an SSO from the burden of ongoing negotiations over prices.

Ultimately, NAAST does leave us with a price to pay, which is the period of monopoly profits that precedes the non-assertion date. However, this is exactly the price we have chosen to pay in the context of patents more generally because government administered reasonable prices are acknowledged to be unworkable. In this sense, NAAST strikes us as far superior to RAND, since it recognizes this price in an explicit way.

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