UNITED STATES OF AMERICA
BEFORE FEDERAL TRADE COMMISSION

COMMISSIONERS: **Timothy J. Muris, Chairman**
Mozelle W. Thompson
Orson Swindle
Thomas B. Leary
Pamela Jones Harbour

In the matter of

RAMBUS INCORPORATED,
a corporation

Docket No. 9302

BRIEF *AMICUS CURIAE* OF ECONOMICS PROFESSORS AND SCHOLARS

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Jay Pil Choi, Michigan State University
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[PUBLIC]

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SSO's rules.[2] Because the SSO may not have the right incentives to design and enforce disclosure and licensing rules, one need not condone hold-up that harms end-users simply because an SSO's rules do not plainly prohibit it.

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In addition, intellectual property policy provides a return to innovation in a socially costly currency—the ability to exclude other potential users of the invention. Once the invention is known, disseminating the knowledge embodied in the innovation may cost little. Yet the right to exclude, whether exercised via licensing or literal exclusion, slows or prevents use of the invention and raises prices. Thus an optimal policy should generally sacrifice incentives at least a bit, and give innovators somewhat less return than their incremental contribution.[4]

3. Market Mechanisms

Normally, if a royalty demand exceeds the incremental value of the patented technology, relative to alternative technologies, it will be refused. For instance, consider a patented process that will save a manufacturer $1 per unit of output. The manufacturer will be willing (if necessary) to pay up to $1 per unit, but will not pay more.

Equally, if the patent-holder declines to license but uses its proprietary process itself, this gives it a production-cost advantage over rivals that is commensurate with the incremental value of its invention.

Thus the market mechanism normally and desirably ensures that the patent-holder does not capture (on a flow basis) more than the incremental value it has created relative to alternative technologies. In order for this mechanism to work, however, users must be able to value the innovation and the terms on which it will be available, against its alternatives.

4. Hold-Up

This normal market mechanism for limiting royalty rates breaks down if users commit (fully or partially) to the use of a technology before they know it is (or will be) patented. Then, they cannot smoothly substitute to an alternative if the royalty demanded exceeds

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[4] For a general discussion of the economics of patents see, e.g., F.M. Scherer and David Ross (1990), "Market Structure, Patents, and Technological Innovation," in *Industrial Market Structure and Economic Performance*, 3rd edition, Houghton Mifflin, pp. 613-60.

As the discussion above suggests, hold-up is most apt to be important where potential licensees, and/or their customers and complementors, must incur large costs or engage in complex coordination in order to shift *ex post* to an alternative technology.[9] Thus the problem of submarine patents is likely to be greatest in such contexts.

6. Standards Organizations' Rules

Standard-setting organizations sometimes have rules about adopting standards that implicate intellectual property.[10] A reasonable interpretation is that these rules are directed toward avoiding hold-up problems as sketched above. Often such rules require reason to expect such a result, and indeed, at least one obvious economic analysis suggests otherwise. This result follows from the fact that direct purchasers of a technology can often pass through royalty costs to their customers downstream, as described below. In this section we make three simple points about a standards organization's incentives to choose and enforce rules on including intellectual property in a standard and on disclosure and licensing of such intellectual property.

A. Standards organizations are a collection of interests

Standards organizations such as JEDEC often include both potential sellers and buyers of intellectual property rights that might be included in a standard. The interests of these two groups may well diverge, but the same members may play different roles in different instances. With respect to the technologies at issue in the present case, for example, Rambus is a seller and the DRAM manufacturers are buyers. However, a number of the manufacturers also sell other technologies used in the production of DRAMs. To some degree, therefore, one might expect the group collectively to choose policies that reflect their joint or aggregate interests, and those interests may well be maximized by higher royalties than an innovation warrants, and by a higher final price than would result from competition with lower or no royalties.

B. Manufacturers may be partly immunized against uniform cost shocks

Even if the policies adopted by the SSO largely serve the interests of technology buyers (here, manufacturers of DRAMs), these buyers may have only weak incentives to resist supra-competitive royalty demands *that apply uniformly to all of them*. Depending on market demand and supply elasticities, such royalties can be largely passed through to buyers downstream. When excessive royalties are passed through, downstream buyers pay higher prices and the manufacturers are to a degree immunized and lose relatively little profits.

It is well understood in economics that an increase in marginal costs, applying equally to all firms in a competitive market, is passed through in a proportion that depends on the relative slopes of the supply and demand curves.[12] In particular, if supply is much more elastic than demand, then the increase is largely passed through, as we now explain.

> Consider a commodity industry characterized by fierce competition and by constant marginal costs up to capacity.[13] The analysis of economic incidence of an increase in each firm's marginal costs depends on whether we consider the short run or the long run, and (in the short run) depends on the state of the industry.
>
> (*1*) In the short run, if c denotes short-run production marginal cost, and r denotes marginal royalties, then short-run marginal cost becomes ($c+r$).[14] If the industry is operating competitively with excess capacity, the marginal cost ($c+r$) will also be the price. Downstream consumers thus pay the royalty, in the economic sense that the final price they pay is higher by r; producers lose only from the resulting reduction in the scale of output (and when price is equal to marginal cost, a modest change in output has little or no profit impact).[15]
>
> (*2*) In the short run, if the industry is capacity-constrained, the final price to downstream consumers must make their demand equal to industry capacity, so r does not affect that price, and its incidence is on the manufacturers.
>
> (*3*) In a "boom and bust" industry that alternates between excess capacity and capacity constraints, the manufacturers will thus bear the cost of r some, but not all, of the time. In the medium run (a period of time during which demand may vary, but that is too short for capacity to equilibrate), one would therefore expect them on average to bear some, but not all, of the cost of increases in r.
>
> (*4*) In the long run (in which capacity can smoothly be brought into or taken out of producing this product), and if there are constant returns in building capacity, the analysis is like the case of short-run excess capacity except that instead of

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[12] For a discussion of this result in the context of pass-through of taxes, see Michael L. Katz and Harvey S. Rosen, *Microeconomics*, 3rd edition, Irwin/McGraw-Hill, 1998, pp. 349-54.

[13] This is sometimes taken as a reasonable description of the market for a specific DRAM design.

[14] For convenience this discussion assumes that the royalty is a fixed sum r per unit of output. If royalties are a percentage of revenue, a more notation-intensive but substantively very similar analysis will apply.

[15] In addition, if industry demand is inelastic, even the quantity effect will be small compared to the royalty.

> short-run marginal cost *c* we would use long-run marginal cost *m* (including capacity cost). Thus, again, royalties—and the effect of hold-up on royalties—are passed through to downstream buyers and have little effect on manufacturers' profits.

Thus competitive firms individually and collectively tend to have only weak incentives to minimize the risk of excessive marginal costs that would apply uniformly to all of them. Such common cost shocks have relatively little impact on profits—especially when the firms compete fiercely on price, the marginal costs of all relevant rivals are affected alike, supply is highly elastic, and demand is inelastic. Downstream consumers, however, are strongly affected by such cost shocks in these cases. It would therefore be wrong for competition authorities or courts to presume that the direct buyers of a technology such as Rambus's can be left fully in charge of protecting the market against such costs, including the possibility that those costs are excessive.[16]

Thus, while manufacturers do have some incentives to craft rules to resist or limit hold-up, those incentives are likely to be quite limited relative to the full incidence of hold-up: there is thus potentially scope for public policy (such as competition policy) to go further in protecting downstream customers. This conclusion is strengthened when standards organizations include not only manufacturer/licensees but also holders of actual or potential patents who might *gain* from intellectual property hold-up: then, one might expect the organization's rules to be even more lenient on the possibility of such hold-up. Of course, the conclusion would be weakened if standards organizations included effective representation from *final* consumers. As noted above, we do not offer any grand solution to this problem here.

C. Manufacturers are not immunized against idiosyncratic cost shocks

The pass-through argument above does not imply that firms generally do not care about their costs: most things that a firm can do to affect its costs do not simultaneously affect the costs of its rivals. A firm bears the burden of "idiosyncratic" increases in its own

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[16] For an application of similar reasoning to antitrust issues including merger investigations, see Joseph

output).[18] In other words, the firm's profits fall roughly by the full amount of the cost increase. Perhaps surprisingly, this is so even if the cost increase is fully or, as here, more than fully passed through to consumers.[19]

Even though a firm subjected to an idiosyncratic cost shock is not immunized by pass-through—its profits fall by the full extent—consumers can also suffer (in this example, from the 75-cent price increase). However, at least the firm has strong incentives to minimize its costs. And if the firm operates in a competitive market, an idiosyncratic increase in its own costs (not paralleled by increases in its rivals') will not affect consumers. Thus firms have strong incentives to avoid letting their costs rise, given what is happening to rivals' costs.

7. What should competition policy do?

We have explained how (a) submarine patents can create market power that is not justified by the economics of intellectual property protection, and that is caused by secrecy, e.g., in the standard-setting process, rather than by the innovation; (b) although direct purchasers of a technology normally have an incentive to guard against submarine patents, that incentive is weakened if they expect the technology to be licensed on nondiscriminatory terms; and (c) the incenti

The intellectual property system is unlikely to function well when potential infringers/licensees cannot evaluate a patented technology and its associated license

APPENDIX A

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CERTIFICATE OF SERVICE

I hereby certify that on April 16, 2004, I served a true and correct copy of the MOTION FOR LEAVE TO FILE *AMICUS CURIAE* BRIEF and the accompanying BRIEF OF *AMICUS CURIAE* of the Economics Professors and Scholars, as set forth below:

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David T. Beddow, Esq.

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