

THE ECONOMIC BENEFITS OF REFORMING PATENT LAW TO ALLOW FOR DAMAGES BASED ON “APPORTIONMENT”

The patent system has been a feature of economies for centuries. It gives inventors the right to control their inventions for a pre-specified period of time, so long as the terms they apply to grant access to their inventions are applied fairly.

The strength and importance of this system are demonstrated by the fact that it has survived almost unchanged in character for so long a period. But the nature of innovation *has* changed, and at times the patent system has failed to evolve.

This is one of those times. The patent system has been built around the idea of protecting the inventor of a “better mousetrap.” That is, the patents granted over centuries have generally been for the invention of a new product or technique that was generally self-contained, like a mousetrap. But at the cutting edges of today’s economy, this model of patent rights misses the mark.

Many modern devices – for example, the Blackberry -- are not themselves patented. Rather, they reflect the agglomeration of hundreds or perhaps thousands of patents for individual parts or components. Each plays some role in making the device work in the manner it does. There is no longer a patent for a “mousetrap” that makes clear whose rights are involved and to what extents in the product.

Moreover, added technological complexity makes the definitions of the inventions to which patents apply an uncertain one at times. It has been noted that over 60 companies claim to hold the patent that makes W-Fi Internet connection possible.

A great paradox of patent law is that, while it gives rights it gives to inventors, its purpose is to guarantee a steady supply of inventions to the subsequent innovators who use them to create economic growth, employment, and a higher standard of living – the rights of inventors are a means to that end. But the failure of the patent system to anticipate and accommodate the complexities of modern technology now works against that purpose.

Return for a moment to the fact that over 60 inventors claim the patent to Wi-Fi connection. Someone attempting to offer such a service would have to come up with a strategy to address this maze of claimants – they would have to recognize some and not others and, by doing so, leave themselves open to suit. The fact that some companies have chosen to offer this technology does not mean that the risk does not exist. In fact, we can only wonder how many *other* companies might offer such a service were it not for the risks involved in doing so.

A further, and even more significant, risk posed by the current patent system is the way in which damages are arrived at in a “complex” product. Imagine a producer who is sued by a patent holder who claims infringement and wins his suit. When claiming damages, the patent holder notes that the producer infringed on his rights and, as a result, was able to gain revenue of “*x*” dollars. What portion of

that amount should be given to the patent holder? In essence, whatever portion a jury of judge is willing to grant. The award could be greater than all the profit earned by selling the product, it could be as great as *all the revenue earned by producing the product*. There is no legal guideline or restriction to prevent such an award; instead, examples of this kind of abuse are common. Moreover, it is entirely possible – and has sometimes been the case – that more than one patent holder can sue one producer for infringement, meaning that the liability of a producer can be *multiples of every cent ever spent on the product in question*.

The potential for abuse inherent in this system has had several negative effects on the economy, employment, research, and investment. The first is obviously the higher level of risk associated with bringing any innovation to market if it relies on work patented by others. No matter how diligently a company may search for the holders of original patents – as is its obligation – there is no protection from the holders of “subterranean” patents, perhaps little known and unpublicized ones, from emerging once the product has gained a foothold in the market and, in essence, ambushing the producer in court. This risk inhibits inventors from competing in markets, and is particularly a difficulty for smaller firms, which lack larger legal staffs and are more vulnerable to this kind of legal strategy.

But an even more pernicious aspect of the current system’s failure to adapt to modern technological realities is the growing role of “non-performing entities,” or NPEs. Non-performing entities are companies that scour the economy for patents that are usually held by lone or small inventors and that could be used as a basis for a lawsuit. These NPEs, having bought the patent, bring suit against as many companies as possible – one prominent example noted an NPE patent holder that sued xx innovator firms *at the same time*. This allows the NPEs – sometimes referred to as “patent trolls” due to this strategy – to spread their costs, while their targets are forced to divert staff time and financial resources in order to defend themselves and are often prepared to give the claimant money simply to go away.

Certainly, sometimes NPEs identify legitimate infringements. But even when they do, the damages they have the right to seek are in no way aligned with the losses usually associated with infringement. Thus, these firms profit from what is a quirk in patent law. But their profit does not improve the incentives to inventors, as patent law is designed to do. Inventions are used in the economy because they have *use-value* – that is, they produce a better product that consumers are willing to pay for. So, for example, a cellular telephone that costs \$100 may contain a switch or display that is worth \$1 out of that hundred. An NPE, in contrast, may acquire that patent for \$2 or more because of the damages that can be won in court. But no inventor will produce an invention that can only be made worthwhile by winning damages in excess of the invention’s actual use-value. For one, it is a risky approach to invention. More importantly, according to the Bureau of Economic Analysis, more than two-thirds of private industry’s research and development is done in-house, anyway.

And to the extent that inventors actually *do* invent in order to pursue these nuisance suits, the nation’s research agenda has been torqued away from the goals of competitiveness and towards serving litigiousness, producing a subtler but real source of inefficiency that weakens the economy in the long term.

“Patent trolling” by NPEs, therefore, is like a tax on innovation. It leads to now new research activity, but does pose risks and costs to innovators who seek to use inventions in new products. For these reasons, many participants in the patent system have advocated a system in which the value of a product containing many different inventions should be “apportioned” when calculating the damages resulting from infringement – if a switch is found to be worth \$1 out of the \$100 cellular phone, damages would be set accordingly. In the rest of this paper, we attempt to estimate the economic losses, most importantly employment losses, that result because of this abuse of patent law and, therefore the gains from a system of “apportionment” for damages.

ECONOMIC EFFECTS

How much do NPEs transfer from innovators and what is the effect of that transfer on the economy as a whole? In this paper, we construct a model of the process as follows. When NPEs impose unwarranted costs and risks on innovators, they reduce the innovators’ ability to finance investment and R&D. (Uncertainty over a Wi-Fi patent, for example, leads potential Wi-Fi providers to delay or postpone follow-on research and development and subsequent investment.) One way to summarize these interactions is to note that, by foreclosing potentially profitable activities, these costs and risks impose losses on the firm that reduce the firm’s value and, hence, its ability to finance those activities. So eliminating the excessive or “surplus” transfer from innovators has the prospect of increasing their investment and their research and development activities. By making them profitable, it would also increase their willingness to hire and make it possible for them to improve the compensation they offer.

But, when assessing the macroeconomic effects of this transfer, it must be noted that if NPEs are no longer allowed to press for unwarranted damages, those firms will no longer make the surplus profits they make by gaming the system. Regardless of its source or merit, spending is spending. If we transfer resources from NPEs to innovator firms, aggregate spending will not change much – what changes the most is *who* is doing the spending, although the rationality and efficiency of that spending will improve. But what *will* change is the total level of investment and R&D in the economy, since the excess profits of NPEs don’t lead to added investment and research, but the added value of innovative firms does. Those investments and research activities produce something “new” or “extra” to the economy – the returns to investment and research. Those returns are the place to find the difference in the economy as a result of restricting the damages awarded to NPEs when infringement occurs.

The steps to identifying the gains from restricting excess damages imposed on innovative firms, therefore, are, in sequence:

- First, to estimate the value of those damages;
- Second, to estimate how eliminating this burden would increase the value of the innovative companies that now must pay them;

- Third, to identify the investment and research gains that follow from that increase in value, and to calculate the employment effects that come from the stream of returns created by those activities.

The Value of Excess Damages

In an attempt to estimate the magnitude of the transfer at stake in the issue of “apportionment” of damages, albeit from the position of advocacy of *preserving* the current system, Professor Shane estimates that *all* patent judgments would drop by 20 percent to 39 percent. He then posits that the value of *all patents* would drop by an equivalent 20 to 39 percent, because the value of patents is determined by what they might be awarded in court.

There are several problems with this approach, even if the initial estimate of a 20 to 39 percent decline in all awards was accepted. First, as mentioned, two-thirds or more of all patents are produced by the firms that use them – “in house” as opposed to “purchased” research and development. These would be unaffected by this change. Second, as stated above, inventors do not receive the full value of patent awards because they produce inventions in line with those inventions’ *use*-value. In the example given above, the inventor will produce a display for a cellular telephone that costs the follow-on innovator more than \$1 – the second dollar can only be extorted from the innovator in court or under the threat of suit. Third, even if Professor Shane had accurately measured the decline in the “average” infringement suit, he would not have estimated the costs to the defendant of legal, engineering, and other resources needed to provide a defense.

Thus, In order to develop an information base for this estimate, the Business Software Alliance asked the law firm of Mayer Brown to conduct a confidential survey of BSA members regarding the types and costs of litigation in which they were involved. The nine companies that responded range in size from a market capitalization of slightly over \$1 billion to over \$50 billion (as of early March, 2009), and have a combined \$197 billion in revenue, and performed \$18.8 billion in research and development, in 2008.

When surveyed, these firms reported that the costs of litigation *from NPE litigants alone* in 2008 totaled about \$800 million – both in terms of actual damages paid and the use of staff resources to support the process. Obviously, neither all of these suits nor all of the awards that they might win are illegitimate. But a substantial portion is. As a base assumption, we assume that half these costs occur due to the reality or potential for unwarranted damages, or \$400 million.

The Greater Value of Innovative Companies

The nine companies involved in the survey, as stated, had combined revenues of \$197 billion in 2008. How large a share of their industries do they represent?

The nine companies come from North American Industry Classification codes 334 (computer and electronic product manufacturing), 5112 (software publishers), 517 (telecommunications), and 5181

(Internet service providers and Web search portals). The data for shipments by NAICS 334 is from 2006, while the other data is from 2007. In the last years available, those industries had shipments of \$1,130 million. If excessive damages award are proportional to revenue, a reasonable assumption, then the \$400 million experienced by the nine survey companies translates to a total of \$2.294 billion by the entire four industries examined here.

How would a reduction of almost \$2.3 billion affect the value of the companies in these high technology industries? Using a price-earnings ratio of 12.5, the value seen in the entire market as represented by the Vanguard Total stock Market ETF, this implies a gain in the value of these companies of \$27.5 billion.

The Economic Benefits

In 2007, the last year for which data were available from the Bureau of Economic Analysis, the combined historical cost value of equipment and software in the manufacturing and information sectors was \$1,350 billion, and the value of new private equipment and software in that year was \$247 billion, roughly 20 percent of that total. Thus, it seems reasonable to presume that around 20 percent of new value transferred to these sectors will be invested or, using the estimate of \$27.5 billion in greater value, investment will rise by \$5.5 billion in those industries. Similarly, in 2004, the last year for which data exist, research and development in those three sectors comprised virtually all research and development by private, for-profit industries, which totaled \$156 billion, again compared to assets of \$1,350 billion, or 12 percent of that value. This suggests that a gain of \$27.5 billion in value in these industries would lead to greater research and development of \$3.3 billion (around 2 percent of the total). These values are annual, as they are the *flow* of investment and research that accrue to the *stock* of greater enterprise value.

This analysis assumes hurdle rates of return – that is, the rate of return companies require to invest -- of 15 percent for equipment and software in the private economy, and 20 percent for R&D. Using those assumptions, these new flows of investment and research would produce returns of \$826 million and \$661 million, respectively, on an annual basis. Using a high assumption of \$60,000 revenue per job created, chosen to reflect the high-quality employment typically associated with investment and research in those industries, these streams of benefits would add 24,780 jobs to the economy on a steady-state basis.

CONCLUSION

The disconnect between the awards that may be obtained in patent infringement suits and the true value of patents' contributions to subsequent innovations has led to an unwarranted transfer of resources away from these follow-on innovators to Non-Performing Entities that search for patents as a premise for

lawsuits. While this may increase the price received for patents by inventors, it does not lead to greater research activity, but does reduce the investment and follow-on research activity of these innovators.

This dynamic leads to reduced investment and research and, ultimately, employment. Given the assumptions made here, employment is approximately 25,000 lower due to this exploitation of patent law.