

What is the value of your patent? Theory, myth and reality

Meir Perez Pugatch *

Imagine the following situation: A man enters a bank and asks for the loan and mortgage department. "Hello Sir", says the clerk, "how may I be of service"? The man answers: "I would like to receive a one million dollar loan to be paid in installments over 10 years". "And which assets do you have as collateral, Sir", asks the Clerk. "Oh, I have my European patent as an asset and the loan is actually intended to develop the patented technology". "In that case", answers the clerk, "why don't you go to our IP Valuation Department, who will carry out the necessary appraisal and risk analysis and, provided the analysis is satisfactory, our bank will be delighted to finance your project".

Now let us go back to reality and ask ourselves how many financial houses (perhaps other than venture capital funds) are willing to finance technology-based ventures on the basis of the technology itself. The answer is not many and perhaps none. In reality, a bank would be willing to provide financial support only on the basis of identifiable tangible assets; not on intangible assets. This is particularly evident since the 2000 bust, which forced many banks and financial houses to do a reality check and adopt a much more conservative, less risky, model of financing methods.

The most straightforward question is, therefore, "*what is the worth of one's patented invention?*" Unfortunately, and as is usual in the case of IPRs, there is no one single answer. Ultimately, it depends upon the person (functionary) you ask: the inventor and patent owner (in many cases they are not the same), the investor, the financier (the bank) or the consumer. Each is likely to have a different perspective on this issue. Each will have a different method of evaluating the patent. And each is likely to provide a different answer. For example, the hired inventor is likely to value the patent on the basis of the income or annual bonus it would add to his fixed salary; the patent owner will value that patent based upon the total income it will generate or the investment it attracts; the financier (in the hypothetical case that one would be willing to provide a loan on the basis of the patent alone) will value the patent at the interest rate it is able to set for the loan; the investor (such as venture capitalists) will value the patent at the additional profit he is able to make on his investment at the point of exit, and the consumer will value the patent on the basis of the price (or the price addition) he would be willing to pay for the patented product.

Based on the short narrative outlined above, and before going into a more structural discussion there are two immediate methodological distinctions that should be made:

- When talking about patent valuation we are actually talking about the technology it protects. In other words, the valuation process considers the patent as a necessary but insufficient condition to the commercial value of a given technology. For example, a non-patented technology can be extremely valuable to society and yet, since it may be easily copied, worth nothing to the inventor. On the other hand, an invention may be fully patentable (i.e. novel, involving an inventive development and capable of industrial application) and would still be worthless if the market refuses to use it.
- We need to be aware(as well as wary) that the business of patent valuation, methodically scientific and advanced as it may be, is ultimately subjective.

Putting relativism aside, it is still very important to highlight, albeit briefly, three elements that are particularly important to the field of IP valuation.

* Dr. Meir Perez Pugatch (MSc., Ph.D.), University of Haifa, specializes in the fields of intellectual property policy and commercialization of knowledge assets. Meir Pugatch is the also head of the IP and Competition Programme of the Stockholm-Network. (meirp@pugatch.co.il)

Patents and the lottery - the odds of success are quite similar

A successful utilization and commercialization of patents is akin to playing the lottery - while the reward from a successful patent can be vast, the chance of obtaining a truly successful patent is slim. Indeed, according to Pitkethly (2002: 3) this metaphor is accredited to the Economist, which as far back as 1851, argued that "patents are like lotteries, in which there are a few prizes and a great, many blanks".

The problem, primarily, derives from the huge gap between the expectations of the individual inventor (patentee) and the overall results of patent exploitation and commercialization.

On the one hand, the individual inventor or the patent owner considers his patent as a ticket to considerable financial rewards. Indeed, to many researchers and inventors, a patented technology is considered a benchmark of commercial success, merely because it is patented. We all like to believe that our patent could become that next pharmaceutical blockbuster, such as Lipitor that generated sales of more than \$US Billion 8.5 in 2002 (IMS Health 2003).

On the other hand, a more structural and statistical observation suggest that only a fraction of patented technologies are commercialized or utilized. It is estimated that less than 80 percent of patents worldwide are utilized (Pugatch, 2004: 59). Even worse, it would seem that most of the patented technologies are worth less than their registration and maintenance fee. For example, Schankerman (1998:94), analyzing the value of patents in France between 1969 and 1982, found that the median value of patents in different technology fields is surprisingly low: \$US 1,631 in pharmaceuticals, \$US 1,594 in chemicals, \$US 2,930 in mechanical and \$7,933 in electronic patents. Schankerman also reports that only one percent of pharmaceutical patents exceed a value of \$US 50,000.

Nevertheless, although the above data provides a somewhat discouraging picture about the commercial viability of the patent exploitation process, it says nothing about the value of the single patent. Accurate methods for valuation can thus help us to get a better grasp regarding the value of our patent, as well as assisting us in taking informed decisions about the manner in which we wish to exploit (or abandon) our patents.

Methods of patent valuation - cost, market, income and options

The field of patent valuation has evolved quite dramatically over the past decade: from a relatively conservative (some would say primitive) one-factor model to quite sophisticated methods of analysis. This article refers to the various types of valuation in brief as literature on this subject is quite extensive (Smith & Parr 2000; Megnatz 2002, Pitkethly 2002, Rozek & Korenko 2005).

A cost-based approach is the simplest method of patent valuation. A cost approach seeks to capture the value of the patented technology by estimating the cost of replacing it with another technology. In its most straightforward expression, a cost-based approach values the patented technology by calculating the total costs of developing it (and adjusting it to present value). Although simple and easy to use, a cost-approach is also very limited, as it only takes one factor (cost) into account when valuating the patented technology. It is also orientated towards past expenditures and is thus retrospective by nature.

A market-based approach values the patented technology by equating it with recent transactions that involve patented technologies of a similar nature and function. Provided that such a transaction did take place, a market-based approach is quite effective as it represents the "real" market value of the patented technology. It should be noted however that in order for a market-based approach to be accurate one must acquire inside information about the details and nature of the transaction, as there are many factors- other than the technology itself - that influence the final value of that transaction. Also, if a transaction of this kind is not available, then a market-based approach is of little use.

An income-based approach represents the second generation of IP valuation methods. Prospective in nature, an income-based approach values the patented technology on the basis of the future income deriving from the successful utilization of the technology. Calculating future returns from a given patented technology requires sophisticated methods of analysis. These are not discussed in this paper given its concise nature. Suffice to it to say that income based-methods aim to capitalize the present value of the patented technology from future income streams, taking three main factors into account: the net cash flow to be derived from utilizing the patented technology (or in more simple terms the extra price that can be earned); the duration of income streams, and the discount rate that is needed to be factored in, such as inflation, risk, interest rates etc.. Income-based methods often use discounted cash flow (DCF) analysis in order to arrive at a more reliable - although not necessarily realistic - valuation of a patented technology.

An option-based approach further develops income-based methods by adding flexibility to the calculation process. An option-based approach treats the R&D process, and the IP it generates, as an "option" to be bought (continued) or sold [in the language of the stock exchange market: call or put] during the various phases of product development utilization. One the main advantages of the option-based method is that it allows us to determine the value of our patented technology during the earlier stages of product research and development. It allows IP owners to factor in, at different stages, both the expected costs of developing the patented technology and the expected returns from utilizing it, taking into account the level of risk associated with the various phases of product development. Theoretically speaking, by using an option-based method, a research organization or a company is better able to understand the business prospects of its R&D project, thereby making more informed decisions as to whether to continue investing in it, seek to license or sell it, or perhaps even to terminate the project.

Back to reality

Coming back to our earlier example, it is quite understandable as to why banks and other financial institutions are not keen to finance an R&D project or a business based solely on their IP portfolios.

Previous sections aimed to demonstrate that patents should be treated more cautiously and more systematically when trying to value the worth of a given patented technology. Statistically speaking, in most cases patents would not make their owners rich. We also need to acknowledge that the value of a patent is ultimately subjective.

Despite this evidence, and perhaps because of it, there is a need to have a more systematic analysis of the value of a patent. Using such methods, inventors and owners of IP would be able to have a stronger understanding of the value of the project they are undertaking, as well as being able to present a better case when seeking finance. Who knows, maybe then we will see the establishment of IP valuation divisions in every bank.

Bibliography

- Megantz, R. C. *Technology Management* (New York: John Wiley&Sons, 2002)
- Pitkethly., R. *The Valuation of Patents: A Review of Patent Valuation Methods With Consideration of Option Based Methods and the Potential for Further Research*, Background Paper for Discussion, United National - Economic and Social Council (21 August 2002) OPA/CONF.1/2002/6
- Pugatch, M.P., *The International Political Economy of Intellectual Property Rights* (Cheltenham, UK: Edward Elgar, June 2004)
- Rozek, R. P, Korenko G. G. 'What is an Idea Worth?' In: Pugatch, M.P., ed. *The Intellectual Property Debate: Perspectives from Law, Economics and Political Economy* (Cheltenham, UK: Edward Elgar, forthcoming: 2006)
- Smith, G. V., Parr, L. R. *Valuation of Intellectual Property and Intangible Assets*_(New York: John Wiley&Sons, 2000), 3rd edition
- Schankerman, M. 'How Valuable is Patent Protection: Estimates by Technology Field', in: RAND Journal of Economics, vol. 29:1 (Spring 1998), pp. 77-107