Do Patents Lead To Efficient Outcomes For The Society? What Role Do They Play With Regards To Innovation?

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ABSTRACT
In this article, the role of patents with regards to innovation and efficiency will be discussed. This article will present a case in favour of granting patents and will attempt to dismiss the notion that patents harm innovation. The basic premise of this journal is that innovation is driven by individuals pursuing their own self-interest and hence, we need patents to ensure more resources are diverted towards research and development. We will look at the EU renewable energy sector in order to analyse the advantages of patents. While examining the pharmaceutical industry, the journal will provide arguments for why patents are essential for the development of new drugs and why inefficiencies in the industry are due to FDA policy, not patents. The journal will then address some of the flaws associated with patents and how they can be corrected in order to yield the greatest possible benefits and fully utilize them.

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ECONOMIC ARGUMENTS FOR PATENTS
A fundamental argument for property rights is provided by Adam Smith in ‘The Wealth of Nations’. When discussing the role of governments in various branches across an economy, Adam Smith strongly proposes a need for a strong legal system in order for free markets to function to the best of their capabilities. This has to do with property rights and incentives. For example, if you owned a property (e.g. farm land), you would be more likely to invest in better infrastructure if you were certain that you had the rights to the property. On the contrary, you would not put much effort into the property if you lived in a lawless country where bandits take your land at gunpoint. This logic applies to intellectual property too. Individuals are more likely to pursue innovative ideas if they have intellectual property rights.

For a more technical outlook, we can refer to a study done by the European Patent Office labelled “Climate change mitigation technologies in Europe – Evidence from patent and economic data”. Renewable energy sources are becoming more efficient through investment in research and development. The study shows the European Union is a major hub for climate change mitigation technologies (CCMT). Europe had the highest number of “high-value” inventions as of 2011. Europe was also the most specialized area in terms of high value innovation after taking over Japan in 2007. The European Union doesn’t have the costs advantages that China has nor is it as efficient as Japan when it comes to producing technological goods. How has the EU been able to compete with (and in some cases even beat) these countries? While regulations have helped the renewable sector, it can be argued that patent filing has played an important role.

The European Patent Office has attempted to create a system where filing for patents and protecting them is easier while the information on developments is more transparent. For instance, with a single application, a patent can be protected in 42 countries. Beyond that, further 148 countries can be covered through simplified and single international application process. While there are already measures that an inventor can take to file

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1 (European Patent Office (EPO) and United Nations Environment Programme (UNEP), 2015).
for a patent faster, EPO is going to make patent related process even simpler and cheaper.

In most cases, inventors aren’t just conducting R&D for the greater good of the society, they are rent-seeking. Adam Smith famously said: “It is not from the benevolence of the butcher, the brewer or the baker that we expect our dinner, but from their regard to their own interest”2. If we had a system where butchers were expected to sell meat for free, we would have a lot less butchers. Similarly, if we simply expected people to invent things, we would suffer from a lack of innovation. By granting patents, we create a system that stimulates innovations. It provides innovators with the assurance that their idea/product cannot be stolen and they will be rewarded for it.

THE ROLE OF PATENTS IN KEY INDUSTRIES

There is another important (and overlooked) benefit that patents provide to the society. Thus far, this journal has followed this logical sequence: Innovation is good for society; the ability to protect intellectual property is essential for innovation. Using the same logical sequence, the following argument can be made: International trading is beneficial for consumers; patents lead to more international trading. In an open economy, consumers have a wide variety of choices at a lower cost. Since different countries have different laws, a patent filed in one country may not hold in another country. As if dealing with tariffs and quotas wasn’t challenging enough, exporters also face the risk of having their intellectual property stolen. For example, if a German firm was exporting solar cells to India, a buyer in India could reverse-engineer the technology and start producing his own solar panels. Since the Indian buyer didn’t have to invest in R&D and etc., he could sell the same solar panels at a fifth of the price. This example is especially relevant to foreign direct investment or FDI. A foreign firm is less likely to set up a factory in your country if their intellectual property is not protected. The risk of their product being replicated is sometimes too high. In fact, the study from EPO took a statistical look into “Relationship between patenting activities, trading and FDI”. Their empirical evidence suggests that there was a strong, positive correlation in the case of trading and also in the case of FDI. Essentially, if the number of patents granted to foreign producers in your country is high, they will more likely sell to you and set up operations in your country. It also further illustrates the extent to which inventors rely on patents for protection.

One could argue that if local producers can produce the same products at a lower cost, the consumers of that product will ultimately benefit. This argument however is short-sighted and is perhaps a static form of analysis. A more dynamic outlook of would take into consideration the incentives behind research and development as well as the long-run impact of innovations. The average consumer will initially benefit from cheaper “knock-off” goods, but what will occur when the innovative firm is not rewarded and eventually exits the market? In the long-run, the quality of products for the average consumer will not improve and there will likely be stagnation in the development of new, cutting-edge technologies that enhance welfare. Simply put, the short-run welfare cost of paying for slightly more expensive but innovative products is much lower than welfare costs of long-run stagnation in research and development.

Patents also play a key role in the Pharmaceutical industry, which is a more controversial topic. A drug development process on average costs a company $800 million and up to 15 years.3 Most economists agree that there are huge risks and costs associated in the R&D of a drug. In order to incentivize companies to conduct R&D, they are awarded a patent which grants them a temporary monopoly. The average patent length is around 12 years from the date of FDA approval. During this period, the pharma company is able to recoup its development costs and make profits.

Consumers (and voters) have expressed their anger at rising drug prices. The notion is that consumers are overall worse off due to the temporary monopoly created through patents. There are two rebuttals to that notion. First: If we remove patents from the equation, how many drugs would be costlier in terms of utility than expensive drugs. Second rebuttal: FDA’s policies, not patents, are to blame. For starters, FDA gives a 6-month patent to the first generic drug maker that can bring the drug to the market. Since branded drug makers pose the formulas to their own drug, they recreate it under a new name.

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2 (Smith, A., 1776)

3 (Benson, M., 2015)
and declare it as generic. Near their patents expiration, they enter the market with their “generic” drug and maintain exclusivity for 6 more months.\(^4\) Other than that, it was found that some generic drugs had quality issues such as improper formulation or packing. This results in inefficient outcomes such as higher costs of providing health care. The race for securing a patent leads to a compromise in quality.

**PROBLEMS WITH PATENTS AND HOW TO FIX THEM**

Patents aren’t perfect and could certainly be altered in order to further increase social welfare and economic efficiency. Usually, patent inefficiencies are related to two categories: Their length and their characteristics. In the US, a patent is usually granted for 20 years. Deciding the ideal length of a patent has to be a responsive process rather than dogmatic. If the costs of inventing/developing a product is high, or its risk profile is high, then it makes sense to grant a patent for a longer duration. However, if a century long patent is granted for a remote control light switch, then obviously the patent does more harm than good. There should be other factors taken into consideration when deciding the length of a patent. For instance, when a patent is granted on a drug, it lasts around 12 years. Policy makers take into account the necessity of drugs as well as the availability of cheaper alternatives. Size of the firm is another factor to consider. Apple, Google and Tesla invest heavily in R&D of self-driving cars. Although self-driving cars will increase productivity, it is not the case that millions of people will die if they aren’t produced. More importantly, neither of these companies require a patent to survive or even make profits from this innovation. These companies have economies of scale and the resources to do able to do it. In contrast, a small firm conducting R&D on self-driving may need protection in order to survive and potentially create disruptive innovation.

Perhaps the most inefficient aspect of patent law is the “first come, first serve” mechanism. In a scenario where two firms are inventing an identical product, firm A decides that it wants to perfect to product and will need more time while firm B decides to file for the patent. Firm B’s patent is granted and all of firm A’s R&D will essentially be discarded. It could have been the case that firm A had a more efficient product. The race for securing a patent leads to a lack of emphasis on quality. Although this is not an easy problem to solve, if the firms are similar in size and etc., they could either be asked to merge or better yet, granted a ‘duopoly’ patent which stops a third firm from using the intellectual property and creates a temporary duopoly rather than monopoly. The dual patent would allow either firm to sell its intellectual property rights to the other but not a third party. This would lead to the most efficient outcome for one of two reasons: the more productive/innovative firm will drive its competitor out of business OR the two firms will negotiate and bargain till the party that values the patent more will compensate the other firm and buy the intellectual property from it.

Referring back to the pharmaceutical industry, some of the patent related issues can be solved with relative ease. For instance, after a drug patent expires, in order to avoid the original patent holders selling the exact same drug under generic labels to prolong their monopoly hold, the government could simply place restrictions on the original patent holder's involvement in the generic sector of the same drug. A more radical solution would be to not allow any patents on generic drugs; why should a generic drug producer be provided any sort of exclusivity (even if it is just for 6 months)? Unlike the innovative R&D firm, the generic drug maker has the formulas and simply has to manufacture the drugs; free market mechanisms on their own should be sufficient. For example, once the patent on a drug expires, the cost of producing that drug is minimal (let us assume it is 10 cents a pill). If the original producer still charges a high price for it, then there is room for a generic producer to enter the market at a lower price. If too many generic drug makers rush into the market at once and there is no profit to be made, then, as basic microeconomic theory suggests, the loss-making firms will exit and the market will return to equilibrium. The point is that once the innovator of a drug has been compensated for the risk (i.e. the patent duration has run its course), the market for that drug should be treated like any other.

**CONCLUSION**

What makes patents such a complicated topic for policymakers is that it is a balancing act between need, and to some degree, greed. The truth is that we as a society need innovation in order to improve our standards of living. A more bitter truth is that the innovation that we need is not

\(^4\) (Fox, E., 2017)
going to come simply out of the good will of risk-taking innovators. An environment needs to be created where self-interests of the innovating entities are aligned with the goals of society. While it is evident that we need patents—and that the society as a whole has benefited greatly due to them—they are not always the perfect tools. It particularly evident in the pharmaceutical industry that when used incorrectly, patents can become inefficient. The first economic theme we dealt with is incentives and risk behind innovation. The second underlying economic theme of this analysis is that sometimes regulations can make problems worse. When it comes to patents, especially in the pharmaceutical industry, the lesson we can learn is that there needs to be a qualitative approach to regulation rather than quantitative. The very regulations that the FDA designed are used by big pharmaceutical companies to maintain control way beyond their patents would have allowed them. In most cases, the sky-high drug prices cannot be attributed to criminal/sinful behaviour by big companies. In fact, insurance companies and hospitals are more likely to be blamed rather than patents or the firms that file for them. It is interesting to note that far more inefficient than patents are the FDA policies such as “citizen's petition” where public members can file petitions to delay pending applications. Of course, 92% of the applications are filed by corporates such as branded drug makers who file to slow down the applications of generic drug makers. Perhaps the inefficiencies in the sector could be fixed by fewer but more effective regulations. However, it seems unlikely that these problems will be dealt soon and the blame for that lies with politicians rather than the pharmaceutical companies. There is a lack of balance when it comes to regulating pharmaceutical industry. On one side, there are those politicians who are involved with pharmacy lobbyists and on the other side, there are politicians who simply want the big pharma companies to lower their drug prices, without attempting to understand the complexities and realities behind the issue.

In summary, this article presents arguments in favour of patents by highlighting the prominent role they play in improving economic efficiency and social welfare. Firstly, the article put forward the argument that individuals are more likely to invest in research and development if they directly benefit from it. To support this argument, a study conducted by the European Patent Office was referred to. The European Union is a leader in high-value innovation and patents have played a key role in achieving this. With the backing of empirical evidence, it has been presented that granting patents also positively impact economies by increasing the level of international trade and FDI of a country. We then looked at an industry where patents are more polarizing. Even though the temporary monopoly created through patents are often blamed for high drug prices, it was demonstrated that patents are not at fault here. If it weren’t for patents, many drugs would never have been created. More importantly, the case was made that FDA policies are to blame for many of the industry problems. The last segment of this article was dedicated to analysing how patents could be improved upon. It was determined that patents can be inefficient when they are granted for the wrong amount of time and are based on vague characteristics. The solution proposed here is that patent examiners have to follow an adaptive criterion. Factors such as the size of the applying firm and the necessity the product should be considered. The most inefficient aspect of patents was determined to be the “first come, first serve” principle. To solve this problem, it was suggested instead of giving the patent to the first of two firms to apply, policymakers should consider creating a “temporary duopoly” where the patent protects both firms from IP theft but allows the two to compete or negotiate for the full rights.

BIBLIOGRAPHY


