DEG
DEPARTAMENTO
DE ENGENHARIA E GESTÃO
TÉCNICO LISBOA

Introductory Economics

Introdução à Economia

Problems

2021/2022

3rd Quarter (P3)

7. Digital economy, information, and social challenges

7. Economia digital, informação e desafios sociais

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7.1 Invention and diffusion can make the innovation process a challenge for public policy. Comment. (Adapted from CORE, The Economy)

When innovation contributes to the decrease of the consumer surplus or hurts companies, it is not efficient for the market. There are 3 aspects of the innovation process that may contribute to this:

- External effects: A firm's successful invention almost always has either positive or negative effects on the value of other firms' investments in the innovation process. Owners of a firm who are concerned solely about their profits will fail to consider these negative external effects. If one firm invests a considerable amount of resources on a certain innovation that is easily overcome by a rival, that investment was not efficient.

- Public goods: Innovation can be seen as the production of new knowledge using a combination of old knowledge and creativity. The fact that most forms of knowledge are non-rival—making it available to an additional user does not mean that some current user will be deprived of its use—makes the innovation process one that uses public goods to produce other public goods.

- Economies of scale and winner-take-all competition: innovation may contribute to economies of scale which are not market efficient, since they may drive competitors out of the market.

7.2 Patents are a form of protecting intellectual rights. (Adapted from CORE, The Economy)

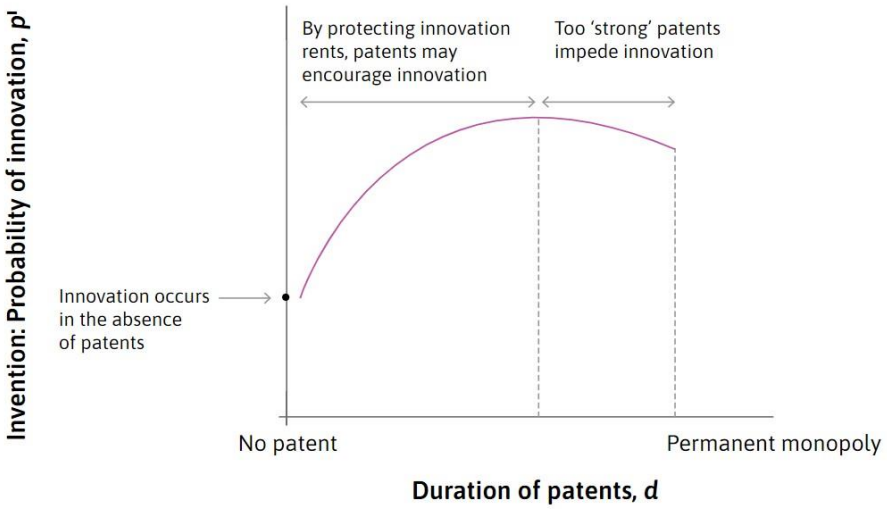
a. How do patents influence innovation?

Patents can either encourage or discourage innovation. On the one side, patents avoid the usage of the existing knowledge to create a new one, meaning that they may discourage innovation (decrease of diffusion). On the other side, since patents protect the innovator and may increase innovation rents, they stimulate creativity and new forms of innovation, through different approaches (an increase of invention). Nevertheless, patents decrease innovation diffusion.

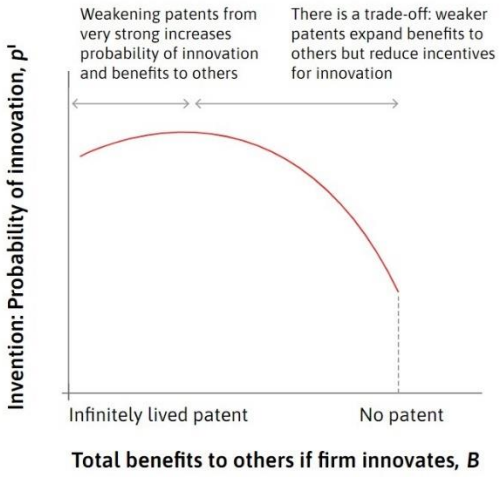
b. Considering the use of patents, what is the trade-off between long and short patents?

Patents confront us with an economic problem: how best to balance the competing objectives of making good use of existing knowledge, devoting sufficient economic resources and creativity to producing new knowledge, and diffusing the new knowledge that is created. An 'optimal patent' is one that best advances the use of knowledge in the economy.

A long patent emphasizes the benefits of rapid innovation (invention) while a short patent emphasizes the benefits of rapid imitation (diffusion).



As the duration of patents increases (moving to the right along the horizontal axis), the probability of innovation also increases because innovation rents are protected for a longer period of time. Beyond a particular length of patent protection, however, the probability of innovation begins to decline because long-term patents will prevent other potential innovators from using protected knowledge or processes to develop an idea.



The graph above presents the trade-off between a higher probability of innovation and the total benefits to others if the firm innovates. As the duration of patents decreases (moving to the right along the horizontal axis), the benefits to others increase. Initially, this increases both the benefits to others should the innovation occur, and the probability of innovation. However, at some point there will be a trade-off: a further reduction in patent duration will decrease the probability of innovation, even though it expands the total benefits that would result should the innovation occur.

For long patents, we have a high probability of innovation and lower total benefits to others. For short patens, we have a lower probability of innovation but higher total benefits to others.

7.3 Innovation is crucial for the world's development. It is systemic since it connects individuals, firms, and government bodies. (Adapted from CORE, The Economy)

a. What is the main objective of the Government regarding innovation policies?

Innovation policies seek to spread socially beneficial innovations, while at the same time providing adequate rewards for those producing innovations.

b. How can the government stimulate innovation?

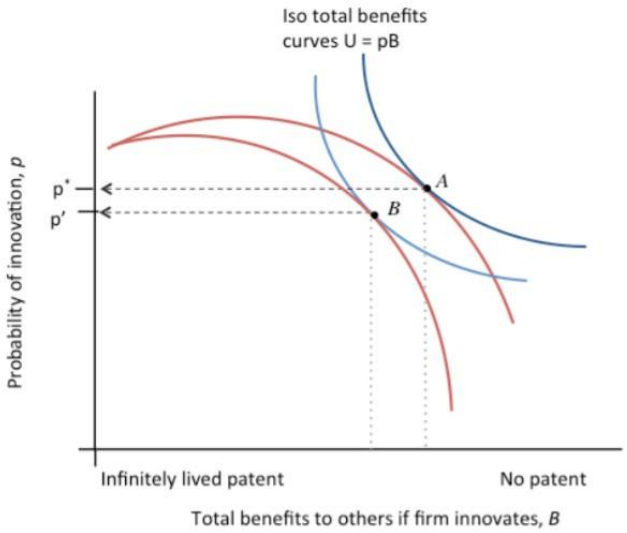
Adequate public policies concerning innovation stimulate it in two main ways:

- Increasing the pace of innovation: This occurs through such interventions as the support of basic research and communications infrastructure, setting standards, as well as the design of patents, copyright, and trademarks.
- Influencing the direction of innovation: This tilts the process towards the production of novel ideas and applications with environmental, learning, medical, or other socially valued applications.

7.4 Consider two contrasting technologies. For one, the Government would optimally choose a short patent duration. For the other, it would choose a longer duration. In each case, draw the feasible set and label the optimal point. Assume the same isototal benefit curves. (Adapted from CORE, The Economy)

Point A – shorter patent is optimal

Point B – longer patent is optimal



7.5 Digital economy has been gaining relevance in the last few years.

a. Define digital economy. Give some examples of its impact on the following industries: retail, transport and logistics, financial services, and healthcare.

Digital economy is an economy based on digital technologies.

Retail: place online orders (often fulfilled from a local store); gather and analyze data on customers, provide personalized service and advertising.

Transports and logistics: tracking of both vehicles and cargo across continents; providing real-time information to customers about the delivery; transportation efficiency (choosing the best routes in real-time).

Financial Services: digital transactions; investment analysis; customer insights.

Healthcare: electronic health records; remote appointments (telemedicine).

b. What are some pros and cons about it?

Pros: reduces costs, increases the amount of available information, greater personalization, may save time, greater flexibility.

Cons: Monopoly power for tech giants, privacy issues, disruption of the traditional jobs (traditional economy).

7.6 How can the digital economy contribute to the mitigation of social problems? Give examples.

Due to its nature, the traditional economy tends to be concentrated in more developed areas. The digital economy, due to its flexibility and reduced costs, can reach more underdeveloped areas compared to the traditional economy. For example, the digitalization of medicine (telemedicine – remote appointments) can help medicine to reach more remote areas. The digitalization of financial services can contribute to bringing these services to more people (Mastercard example in Africa - https://mastercardfdn.org/work/next-gen-fin/).

7.7 Why is data considered the new currency?

In traditional currency transactions people exchange cash for goods and services of equal value. But data trade is one-sided, and an explosion of consumer data has enabled companies and brands to forge one-to-one relationships more easily by offering tailored experiences and recommendations to end-consumers. Data is an asset both in terms of how companies can use data to increase cash flow by targeting buyers more precisely, and how they make money from the data externally for example with advertising or from selling customer data to third-party sources.

7.8 What is the Sharing Economy? Give examples.

The sharing economy is an economic model defined as a peer-to-peer (P2P) based activity of acquiring, providing, or sharing access to goods and services, often facilitated by a community-based online platform. Sharing economies allow individuals and groups to make money from underused assets, thus, idle assets such as parked cars and spare bedrooms can be rented out when not in use. In this way, physical assets are shared as services. Examples include Uber, Airbnb, and Rnters.