# KNOWLEDGE AS AN ECONOMIC GOOD

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**Abstract.** Knowledge nowadays has strategic importance for the economies and enterprises all around the world. The object and internal dynamics of the entire social reproduction have significantly been altered. Nonindustrial production now has moved from tangible, material objectivness to expressing its objectiveness by producing ideas, innovations and knowledge. The new forms of production as well as the new technologies have rejected the rigidity and inflexibility of the conventional factors of production. This, above all, is due to the unique characteristics of the knowledge as an economic good. In that context, the aim of this paper is to give a brief theoretical analysis of the role of the knowledge as an economic good in modern working conditions when a new economic paradigm called knowledge economy is predominate.

**Keywords:** knowledge, cumulativeness, spillovers, externalities, research and development.

## 1. Introduction

Changes that are ongoing or which will occur in the future, dramaticaly change the treatment and attitude towards knowledge as an economic good. The speed at which the knowledge is processed, as well as the speed of developing strategies for market appearance in accordance with the information and knowledge that are gained, determine the success of the operations in the modern business.

Products that incorporate knowledge are more durable, more functional, more sustainable, more useful, more intelligent and consume less energy compared to products that originate from conventional economy production. Probably the 21st century, among other things, will be characterized by the fact that it will be a century in which a cult will be created towards innovation and knowledge.

**2. Dispersion and types of knowledge**

There is knowledge that can be transmitted and distributed among people, as well as knowledge, that cannot be spread in a traditional way through the learning process due to its specificity. That type of knowledge (such as experience for example) can be shared among people in the process of work [1].

Knowledge transmission is not limited only to the process of learning from those who know to those who do not know, because some skills simply cannot be transmitted through conventional forms of learning. On the other hand, the traditional knowledge and skills that have been valued for centuries in the society are slowly becoming redundant in the coming period.

For example, the traditional skills and knowledge of the medical doctor have been losing their legitimacy in the light of everyday inventions in the pharmaceutical and biotechnical industry.

New drugs, new methods and electronic devices for diagnosing and treating, require from the medical staff to devote more time to acquire new knowledge that keep pace with new innovations in the field of medicine, rather than in establishing the traditional relationship between a physician and the patient.

According to another classification [2], there are following types of knowledge:

- Know-what, refers to knowledge about "facts". How many people live in New York, what the ingredients in pancakes are, and when the battle of Waterloo took place are examples of this kind of knowledge. Here, knowledge is close to what is normally called information - it can be broken down into bits and communicated as data. This type of knowledge is relatively accessible to a broader spectrum of subjects in society, which makes it less strategic in terms of competition.

Know-why, refers to knowledge about principles and laws of motion in nature, in the human mind and in society. This kind of knowledge has been extremely important for technological development in certain science-based areas, such as the chemical and electric/electronic industries. Access to this kind of knowledge will often make advances in technology more rapid and reduce the frequency of errors in procedures involving trial and error. Also, it facilitates the production of smart devices which are very important for the competitiveness strategy in global operations.

- Know-how, refers to skills – i.e. the ability to do something. It may be related to the skills of entrepreneurs and production workers, but, actually, it plays a key role in all important economic activities. The businessman judging the market prospects for a new product or the personnel manager selecting and training staff use their know-how. It would also be misleading to characterise know-how as practical rather than theoretical. Know-how is a kind of knowledge developed and kept within the borders of the individual firm or the single research team. As the complexity of the knowledge base increases, however, co-operation among organisations tends to develop. One of the most important reasons for industrial networks is the need for

firms to be able to share and combine elements of know-how. Similar networks may, for the same reasons, be formed among research teams and laboratories.

- Know-who, involves information about who knows what and who knows what to do. But it also involves the social ability to co-operate and communicate with different kinds of people and experts. This type of knowledge is sometimes more important than the knowledge of the science laws. In this context, it should be mentioned the existence of the so-called social capital. Social capital implies capitalized economic benefits that society receives from cooperation, communication, interaction and trust among individuals. It is a capital of lasting and institutionalized relationships among individuals and organizations, which facilitate activities and create value. Social capital positively affects economic transactions, production, trust, willingness to take risks, the quality of negotiation, reduction of transaction costs and fraudulent information, etc. The World Bank in terms of Social Capital lists the institutes, relations and norms that form a qualitative and quantitative social interaction in society. There are three forms of social capital that are distinguished: structural (associations, networks, institutes, regulations and laws governing functioning), relational (quality of network connectivity) and cognitive (norms, behavior, relationships, trust, values). Trust is fundamental to the relations among enterprises, consumers, employers and workers, and therefore, in the light of social capital, a sense of good business customs is developed as a set of "unwritten rules", regulating the relations among enterprises and individuals. In this context, the distinction between human and social capital should also be emphasized. Namely, while human capital refers to an individual, social capital refers to the social tissue of the individual. [3] The tendency toward socialization is much more difficult to acquire than other forms of human capital, but precisely because it is based on ethical standards, it is much more difficult to change. Here it should be emphasized that trust plays an important role in the social system because it is a good that it can not be easily bought, and it, as well as loyalty and sincerity, are positive externalities, i.e. intangible goods that have real, practical and economic value. [4]
- Know-where and know-when represent important knowledge in a flexible and dynamic economy.

In general, today prevails a specific type of interaction among enterprises that are specialized in certain areas of technology and this interaction is mainly reflected in the transfer of knowledge among those enterprises in order to implement joint projects. This particularly applies to companies in the fields of: physics, medicine, biotechnology, information systems, etc.

### 3. Characteristics of knowledge as an economic good

Knowledge is a specific good, with properties that differ from those characterizing conventional tangible goods. These specific characteristics of knowledge as an economic good are: a) knowledge is a good that is difficult to control, i.e. is a

nonexcludable good, b) knowledge is a good that is nonrival, and c) knowledge is a good that is cumulative.

a) Knowledge is difficult to make it exclusive or to control it privately. It is a fluid and portable good. Knowledge can be kept secret, but as soon as it is revealed it slips out of control. The degree of excludability of knowledge strongly determines the way of its disclosure and allocation, and thus the intensity of the deviation from the perfect competition. If one type of knowledge is completely nonexcludable, there will be no personal benefit from its disclosure, so research and development in these fields must arise from another initiative (for example, from state subsidies).

But when the knowledge is excludable, producers of new knowledge can license the right to use knowledge for a positive price (price higher than zero) and then can expect that they will make profits from their R&D (research and development) efforts.

A firm finds it far more difficult to control its knowledge than its capital goods, for numerous opportunities for leaks and spillovers arise. Information and knowledge continuosly escape from the entities producing them, and can thus be used freely by rivals. The literature uses the generic term "positive externalities" to denote this positive impact on third parties, from whom it is technically difficult to obtain compensation. Knowledge externalities are nonpecuniary because there is no financial compensation for the knowledge producer. They are different from so-called pecuniary externalities that relate to cases in which inventors are unable to recover from buyers the full value derived from the innovation. Certain analyzes and research in this field show that information on research and development (R&D) decisions is known to rivals within six months, while technical details are known within a year. However, the harnessing of knowledge by other firms depends on their learning capacity.

b) Knowledge is characterized by nonrivalry [5]. The direct implication of this fundamental knowledge characteristic is that its production and allocation can not be fully driven by competitive market forces. In addition, the marginal cost of the nonrival good is equal (or close) to 0. Hence, the cost of renting knowledge on the competitive markets is zero.

But then, the creation of knowledge will not be driven by the desire for private economic benefit. Accordingly, knowledge is either rented over its marginal cost, or its disclosure is not motivated by market forces. Therefore, a small deviation from the competitive model is required.

Knowledge as a nonrival good is produced only once and has two dimensions: an individual dimension and a collective dimension. First, the same knowledge can be used an infinite number of times without any cost (individual dimension). Second, an infinite number of agents can use the same knowledge without depriving anyone of it (collective dimension). Thus, on the one hand, the same quantity of knowledge used to realize m units of output will serve to make m+1units and, on the other hand, the same knowledge used by n people can be exploited by n+1 people.

c) In the field of science and technology, knowledge is most often cumulative and progressive. This means that externalities enhance not only consumers' enjoyment but also the accumulation of knowledge and collective progress.

It is possibility for someone to "stand on the shoulders of giants". In other words, what spreads and can be used an infinite number of times is not only a consumer good but an intellectual input likely to spawn new goods that will also be usable an infinite number of times [6]. In the new knowledge economy many types of knowledge are strongly cumulative, such as data bases (the international DNA data base for example). These stand in contrast with noncumulative knowledge (consumption goods) such as songs, entertainment programs, or galleries of photographs available on the Internet.

**4. Public good and the knowledge dilemma**

The main implication of the three characteristic features of knowledge is the creation of a difference between the private and social return in the production of knowledge. It is basically, the uncontrollability, nonrivalry and cumulativeness threesome that accounts for the importance of social returns to research and innovation. In the presence of externalities, inventors must expect to receive less than the social returns of their invention.

Technological knowledge is a good that is difficult to control in terms of spillover, it is also a nonrival and cumulative good. These different characteristics enhance the strength of the positive externalities and thus increase the difference between private and social returns. Thus, social returns may be so substantial that remunerating the inventor accordingly is unthinkable.

Since the marginal cost of use of knowledge is 0, maximum efficiency in its use implies that there is no restriction to access and that the price of use is equal to zero. Knowledge should be a "free" good.

That is the requirement for optimum use of a nonrival good. But whereas maximum efficiency in the use of knowledge supposes rapid and complete distribution, and hence requires that its price be 0, the same does not apply to its production.

Producing knowledge is costly (in some cases too costly). As a result, maximum efficiency in the use of resources needed to create new knowledge requiress that the costs of all necessary resources be covered by the economic value of the knowledge created. This actually represents the core of the dilemma. Namely, only the anticipation of a positive price on use (a price that is higher than 0) will guarantee the allocation of resources for creation, but only a price that is 0 will guarantee efficient use of knowledge, once knowledge has been produced. It is a dilemma between the social objective of ensuring efficient use of knowledge once it has been produced, on the one hand, and the objective of providing ideal motivation to the private knowledge producer [8]. This problem manifests itself in any kind of knowledge, but only the cumulative nature of knowledge makes this problem a serious issue. There is no simple solution to that dilemma. The answer will differ from case to case.

In this sence, it is not possible to consider and treat in similar terms knowledge as a consumption good and knowledge as an investment good likely to spawn new (knowledge) goods. The more knowledge is cumulative, the more wasteful is the effect of rationing it by price. The dilemma indicates that a positive externality, produced by a nonrival and cumulative good cannot be corrected like a negative externality (or, more precisely, actions aimed at correcting a positive externalities can't be the exact opposite of those aimed at reducing a negative externality). In the case of negative externalities (noise, pollution), the problem is relatively simple: it is necessary to act on the source of the emission, either by demanding correction at the source or by taxing it (for example, putting the isolation along the roads, or installing biofilters in the chimneys that emit harmful gases in the air above the permissible limit, or by introducing environmental tax). In the case of a positive externality, the problem is not reducing it, because it is positive. The matter is more complex and the line is thin between the goal of protecting the creator's interests and that of maintaining benefits for society.

## 5. Concluson

The realization of new form of production requires purposefulness, creativity, prediction, guidance, control. In one word it requires knowledge. The knowledge economy operates with knowledge as good of the best quality, that is, as a mean of production and a competitive advantage. In companies that are characterized by high intensity of knowledge, and the product life cycle is short, the knowledge they possess is a rather unique resource.

In a situation when markets change significantly, technologies are rapidly being upgraded, and the number of competitors is constantly increased, successful enterprises must create new knowledge, spread it and fast materialize it in the form of innovated products. This is even more important if one takes into account the characteristics of knowledge as an economic good, but also the possibility that knowledge, because of its unique characteristics, is treated as a public good. In this context, the dilemma is how to impose a balance between the goal of protecting the creator's interests and that of maintaining benefits for society.

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