

THE EFFECTS OF KNOWLEDGE ECONOMY ON THE COSTS AND COST COMPARISON OF TRADITIONAL AND DIGITAL GOODS

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Abstract

In traditional economics, the cost of production decreases as the production rate increases (scale economics is valid). After a certain level average cost begins to increase again (scale diseconomies)

In other words; as the production increases, after a certain level the cost increases gradually. On the contrary, in Knowledge Economics cost decreases gradually as the production increases. Decreasing cost style is one of the most important features of new sector which is formed by Information technologies. The structure of cost in digital goods and services production differs from the traditional production. Producing digital products goods generally require great deal of investment at the beginning. Those investments can be named as “sunk cost”. By this it is meant that, after giving up the investment it is not possible to get the invested money by selling the goods or by other ways. However, once the digital goods are produced their reproduction (copying) is low cost. Consequently, in the production of digital goods as the productions increases, the marginal and average cost decrease and income increases. In production of these types of goods the cost of developing them is important but afterwards cost of copying them or introducing a similar one to the market is so low. Therefore marginal cost is not only low but also equal to zero. In this research mainly the changes in the cost of

digital goods and services are examined, however the effects of knowledge on the costs of production of goods and services will be mentioned too.

Key Words: *Knowledge, Knowledge economics, New economics, Costs.*

JEL Classification: L11, O16

1. Introduction

The developments in information and communication technology in developed countries in recent years directly or indirectly cause different effects on the economic performance. In parallel with such developments, several economic terms related with micro and macro level gradually differentiate and lose their old meanings. This phenomenon is called as new economy or knowledge economy. Considering the changes in the global economy and USA economy especially in the last decade, it is seen that the new economy has radically changed the existing system due to its effectiveness, pressure for restructuring, global nature and the crises it caused in several economies.

While old industries lost their importance, profitability, employment volume and production capacity throughout time, new industries keep growing and become the locomotive for the economic growth. The knowledge economy emerging with the technological developments and depending mainly on digitization and internet causes major changes in the old economy. This change process named as New Economy or Knowledge Economy is a combination of technological changes that can control speed and a good sustainability policy. While new information, research results and new technologies save time and cost, the living standard of the societies gradually increase.

Different groups give different meanings to the information economy. These meanings change from the ones with a comprehensive scope emphasizing the invalidity of classic economy theories and fast technological change in the global competition era to the ones with a narrow scope including the impact of information and communication technologies in the production and effectiveness increase. Moreover, some authors prefer using teconomy, e-economy or digital economy as the scope is very extensive and each person may understand the term in the way he likes. However, knowledge economy or new economy terms are more common and accepted globally (Bayrac, <http://www.bilgiyonetimi.org>).

2. Some Basic Features of Production and Product In Knowledge Economy

There is a significant difference between digital and traditional goods and services in terms of production costs. It can be said that decreasing return to scale applies for the production of traditional goods and services. That means if the production amount increases, marginal income will decrease. This also means increasing costs to scale. When the production amount increases, not only marginal costs but also average costs tend to increase throughout the time (Yürekli, <http://www.bilgiyonetimi.org>).

The cost structure of digital goods and services is different than the foregoing. The production of such goods and services generally requires major investments in the beginning. These investments can be named as “sunk costs”. The term sunk costs as used here refers to the costs that cannot be recovered with the sale of investment goods or in any other way if the investment is discontinued (Saphiro & Varian 1999). However, after their first production, the cost of reproduction (or to put it more clearly, copying) of information goods can be very low. Thus, it can be said that marginal and average costs of production of information goods tend to decrease (very fast).

On the other hand, the first production and reproduction of traditional goods and services cause significant costs each time. Moreover, the first costs incurred in the production of several traditional goods and services can be recovered. Thus, they are not sunk costs.

Any book is a digital good. The first costs of production of the book are very high. The costs of author's copyrights, typesetting processes, films etc. are required for the production of the first copy. Such costs are called fixed or sunk costs (Saphiro & Varian 1999). However, the costs of the second and other copies are very low after the production of the first copy (Saphiro & Varian 1999). That is why as the production amount of information goods increases, the marginal costs decreases and the income increases.

A definition can be given for such goods by taking into consideration the foregoing features: Digital goods and services are non-rival, non-excludable and non-transparent goods and services that can be digitalized and coded in parts, whose production costs tend to decrease (Yürekli, <http://www.bilgiyonetimi.org>).

The strategies applied by seller for the sale of such goods are also different from each other. These strategies applied for the sale of digital goods and services are actually practices to acquire consumer surplus. In its simplest meaning, consumer surplus refers to the difference between the price that the consumers want to pay for any goods and the actual price they pay. Two important ones among these strategies are versioning and bundling (Shapiro & Varian 1999).

Versioning strategy depends on simultaneously launching of different versions of any product into market and to direct the consumer plus from the consumers that want to pay different prices. This is especially used in the software sector. Bundling, another strategy, is based on the sale of more than one goods as packaged and purchase of the surplus by different demand groups. This is also mainly used in the software market (Pindyck & Rubinfeld 1992).

Finally, experience goods can be taken into consideration. Experience goods practice is a practice for the completion of the information considered as missing by the consumers as the digital goods and services are non-transparent. Goods and services are made available to the user for some time and users are ensured to learn about the goods. Consumers may purchase or decide not to purchase the goods. The most frequently used products in this practice are software products. A number of software is launched in trial versions and aims for providing users with information about the goods.

The basic principle of knowledge economy is “make your product go out of fashion”. If a new and successful product is developed and launched, the aim should be to launch a more developed version of this product and making the first product go out of fashion (Tapscott, 1996). If you do not make your product become old, another person may certainly do it (Güvenir, 1999).

The gap between producers and consumers gradually expand within the knowledge economy. As the mass production was replaced mainly with production based on the expectations of consumers, producers had to produce goods and services based on the desires and preferences of individual consumers. Due to the increase in the number of knowledge-based products and services within the knowledge economy, consumers do not only use information and technology but also become an information and technology producer (Akin, 2001).

The knowledge economy is like a Network Economy. The Network Economy term is used for sectors comprised of end points such as information technologies, telecommunications, electricity and transportation and the communication links between the same and structured in a network order. Network Economies have some important features. The first one is externality. As new end points are added to the network, the value of the network exceeds the value of the units comprising the network. For instance, a single fax machine does not serve any purpose, the benefit earned by the fax machine will increase as the number of fax machine users increase.

There is direct link between the increase in the value of Microsoft Windows within the software sector and the number of software operation on this operating system. In Traditional Economy, the scarcer a product is, the more its value is. However, this rule applies inversely in knowledge economy. The value of a network product increases with the number of products that may have a link with it (Ülgen, 2000).

The knowledge economy contains knowledge-based or knowledge-intensive goods such as software, medicines and biotechnological products. As the intensity of knowledge within any goods increase, the marginal cost of such goods is nearly zero, the competition is eliminated from consumption and it becomes a goods with the same features of any public goods (Coates & Warmick, 1999). As digital goods and services are based on information, they are considered as having information features in following situations (Quah, 1999).

The products can be accessible without any limits. A person purchasing a special goods may exclude others from consumption and special goods may be consumed when they are used. However, when a consumer uses any information, such information continues to exist as a goods and may be accessed by other consumers without any limits. When different consumers in different places in the world download and use any software, there will be no decrease in the use of and the benefit earned from this product for any consumer. Thus, they are like knowledge-intensive products.

The market of such goods does not exist physically and depend on distance and place.

If any person has not used such products before or if any expert in the relevant product group has not tried the product, the benefit of the product cannot be known for sure.

The rule that the earner will earn the entire income applies. The first person to invent the knowledge-intensive goods will have all the rights of such product.

The supply or quality of many information-based product will not be increased by adding to the inputs. Use of more computer software or employment of more employees will not guarantee the development of a better software.

Due to the foregoing features, a temporary monopoly should be established for the success of digital goods and services producers for the protection of intellectual property rights such as patents and copyrights for a period that will ensure the fulfillment of costs and new investment expenses (Aktan and Vural, 2003). Such rights are protected in developed countries especially under the laws; however, this protection is yet to be established in less developed or developing countries.

3. Costs In Traditional Economy

Any firm protected under the system for intellectual property rights such as patents and copyrights is temporarily a selling monopole as it produces and sells a product which is very difficult to substitute. A monopolistically competitive market is established in the long run with the addition of new firms producing similar goods and services.

The firm loses money as the total income is less than total costs within each production amount until such amount increases to a desired level. The loss of the firm will be zero as the total income equals to total costs when the production volume increases to the predetermined level. The firm will earn profit if it continues to increase production.

4. Costs In Knowledge Economy

Costs within the knowledge economy decreases when the production amount increases. The decreasing costs are one of the most important features of new sectors emerged from communication technologies. The cost structure of the production of digital goods and services differs from the traditional production. The production of digital goods requires major investments in the beginning. These investments can be named as “sunk costs”. The term sunk costs as used

here refers to the costs that cannot be recovered with the sale of investment goods or in any other way if the investment is discontinued.

The firms producing digital goods start their operations with loss and bear loss in the short run. Such firms succeed in bearing high fixed costs named as sunk costs at the beginning and the changing costs which are lower than fixed costs by increasing their productions fast in parallel with the increase in demands as their products are generally accepted within the market with direct or indirect externalities. The general acceptance of products by users is very important. Producers must ensure this general acceptance with some distribution and promotion activities such as low pricing policies, encouragement and familiarization of corporate users by free distribution to individual users, trial versions, version renewal and goods and price differentiation as the marginal costs are low.

As the value of marginal costs of digital goods is nearly zero, the producers experience two important problems. First of these that a pricing policy based on marginal costs renders the bearing of fixed costs in the short or medium term. The second is that the distribution of digital goods is very easy by copying when its distribution is in digital form. Despite these problems, the fact that the digital products have very low marginal costs despite high fixed costs affects the economy positively. That is because low marginal costs and thus, low prices encourage products by ensuring increase in prices and providing high returns.

The presentation costs of goods and services decreases as the amount increases within the traditional economy. This process continuing until a specific level is followed with the increase in the average costs when the production increases. Regarding the goods and services within the knowledge economy, the marginal costs together with the production level approach to zero asymptotically (Ülgen, 2000).

In parallel with this, as explained in the diamond example, the rule that the value of any goods is higher when the production amount is low applies inversely and the value of any product increases when the number of products that can be used as its substitute is high.

5. Conclusion

The process called knowledge economy is claimed to cause radical behavioral differences in several fields from efficiency and technological developments,

networks, exchange market and management. Major and permanent increases are experienced in the growth speed in efficiency and technological developments. A new period emerges where the capital mobility increases, the labor force competition becomes hot and the competition increases especially in product markets.

While the importance of information production increases within today's techno-economic paradigm called as knowledge era, increasing return principle starts to apply in production. A decrease is experienced in distribution costs and an increase in mass consumption within this process. Moreover, especially network externalities are witness and major decreases in costs are experienced in parallel with this.

However, it cannot be said that the new economy is very much different than the traditional economy in terms the general features and price and cost structures of digital products. It is not true to claim that the economics theory is entirely insufficient while analyzing the new economic structure. Moreover, the studies considered under the knowledge economy literature mainly use the general analysis devices of economics theory. In short, although the knowledge economy has some unique features, it generally has a similar structure with the traditional economy due to the differences in the mobility of price and cost variability.

BIBLIOGRAPHY

Akın H. B. (2001), Yeni Ekonomi, Strateji, Rekabet, Teknoloji Yönetimi, Çizgi Kitapevi Ya. No: 39, Çizgi Ekonomi: 9, Konya.

Aktan, C.C. ve İ.Y.Vural (2003), "Bilgi Toplumu, Yeni Temel Teknolojiler ve Yeni Ekonomi" , (Yayınlanmamış Çalışma), (<http://www.canaktan.org/yen-trendler/yeni-ekonomi>) [16.06.2006]

Bayrac, H. N., "Yeni Ekonomi ve Yarattığı Değişimler", <http://www.bilgiyonetimi.org>[17.06.2011]

Coates, D. & K. Warwick (1999), "The Knowledge Driven Economy: Analysis and Background", (The Economics of the Knowledge Driven Economy, Paper Presented at a Conference Jointly Organized By The Department Of Trade and Industry and The Centre for Economic Policy Research, London, 27 January 1999), pp.11-22.

Erdoğan, S. (2003), “Elektronik Piyasalardaki Mal ve Hizmetlerin Fiyat ve Maliyet Yapısı Üzerine Karşılaştırmalı Bir Değerlendirme”, Kocaeli Üniversitesi İktisadi ve İdari Bilimler Fakültesi 17-18 Mayıs 2003 II. Ulusal Bilgi, Ekonomi ve Yönetim Kongresi Bildiriler Kitabı, ss.99-105.

Güvenir, A. (1999), “Yeni Ekonomi Maddeyi Tahtından İndirdi”, Türk Henkel Dergisi, Sayı: 173, İstanbul.

Pindyck, R. & Rubinfeld, D. (1992). Microeconomics. 2nd Ed., New York: Macmillan.

Quah, D.(1999), “Growth and Increasingly Weightless Economies”, in: (The Economics of the Knowledge Driven Economy. papers presented at a conference jointly organized by the department of trade and industry and the Centre for Economic Policy Research, London, 27 January 1999).

Shapiro, C. & H. R. Varian, (1999), Information Rules: A Strategic Guide to the Network Economy, Harvard Business School Press, Boston:Massachusetts.

Soyak, M., Yeni Ekonomi ve Yansımaları, Marmara Üniversitesi Sosyal Bilimler Meslek Yüksekokulu,
http://www.bilgiyonetimi.org/cm/pages/mkl_gos.php?nt=202 [10.06.2011]

Tapscott, D. (1996), The Digital Economy, Promise And Peril In The Age Of Networked Intelligence, McGraw-Hill, New York.

Ülgen, S. (2000) “Yeni Ekonomide Rekabet Kuralları”-Rekabet Kurumu Perşembe Konferansları 8, Mayıs 2000

Yürekli, S., “Yeni Ekonominin Yeni Ticaret Biçimi ve Bileşenleri: Elektronik Ticaret, Enformasyon Malları ve E-Para”, <http://www.bilgiyonetimi.org> [16.06.2011]