



EVALUATION OF TECHNOLOGICAL PROGRESS AND GROWTH RELATIONSHIP IN TURKEY

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ABSTRACT

Developments in the field of technology have deeply affected people, societies and states living in every corner of the world, especially in recent years. The smallest technological change that occurs with the globalization process affects the whole world at the same speed. Technological progress is one of the most important factors that increase the economic growth of countries. In order to draw attention to the importance of the title, to include various definitions of technology and to be able to handle development process economically. In addition, the relationship between technological progress and growth will be emphasized and the relation between technology policies applied in Turkey and growth will be given.

Keywords: Technological Progress, Economic Growth, Technology Policies

Jel Codes: F43,O10,O14

TEKNOLOJİK İLERLEMELER VE BÜYÜME İLİŞKİSİNİN TÜRKİYE AÇISINDAN DEĞERLENDİRİLMESİ

ÖZ

Teknoloji alanında yaşanan gelişmeler dünyanın her bir noktasında yaşayan insanları, toplumları ve devletleri özellikle son yıllarda çok derinden etkisi altına almıştır. Küreselleşme süreciyle birlikte ortaya çıkan en ufak teknolojik değişim aynı hızla tüm dünyayı etkilemektedir. Teknolojik ilerleme, ülkelerin ekonomik büyümesini arttıran en önemli faktörlerden biridir. Başlığın önemine dikkat çekmek adına bu çalışmadaki amaç; teknolojinin çeşitli tanımlarına yer vererek, gelişim sürecini ekonomik açıdan ele alabilmektir. Ayrıca teknolojik ilerlemelerin büyümeyle olan ilişkisi üzerinde durularak Türkiye’de uygulanan teknoloji politikalarının büyümeyle olan ilişkisine yer verilecektir.

Anahtar Kelimeler: Teknolojik İlerleme, Ekonomik Büyüme, Teknoloji Politikaları

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INTRODUCTION

Technological developments have significant effects on the production processes and organizational methods in the economy, which have socio-cultural effects on the social area. In this context, the technological developments that brought about permanent economic, social and political transformations have revolutionized human history. Due to the developments in the world economy and the increasingly competitive pace, interest in innovation has increased in recent years. Because innovation is an important factor that increases the growth rate of the economy at the macro level and the profits and the market shares at the micro level.

From an economic standpoint, countries on the one hand become increasingly open and dependent, while innovation on the other hand has become the driving force of economic development. Rapid communication and close contact between innovators in different countries in these two processes has facilitated the innovation process and the spread of new ideas. Rapid changes in technology have exacerbated commercial motives and the formation of integration in the world trade system. Therefore, interest in efficiency and technology has naturally increased.

Historically, economic growth has been important to economic growth since Adam Smith's savings and influences. During the 18th century and the 20th century, economists argued that economic growth would come to an end by declining yields. However, these pessimistic thoughts have been destroyed by countless technological developments. Technological developments have provided consumers with a range of goods and services that they could not even predict two centuries ago. Thus, the innovation created by science and technology has become a subject of further study in growth models and practice studies as the driving force of economic growth.

In this study, firstly the conceptual framework of technology was emphasized, then technology and economy, uncertainty of the future and Schumpeter's contributions, technological progress and economic growth process, technological progress on the effects of economic growth and finally technology policies applied in Turkey.

1. CONCEPTUAL FRAMEWORK

1.1. Technology and Economy

Technological innovations; economic, industrial, political, and military fields, and countries with these new technologies have great advantages over others. Being among the developed societies of our age requires that the level of wealth and knowledge is at the level of other societies. There is only one way; to be able to present the technological knowledge as desired products, services and services in the industry, to have a significant share in the markets, and to have all the possibilities to form the information society. Within the economic growth process, the changes made in resource allocations and the gains recorded in efficiency level are integrated with the productivity gains gained through technological development. In addition to the product variety, the increase in the share of the industry in total production with the increase in quality and productivity is achieved by transferring the technological knowledge to the industrial sector. Technological developments give opportunity to produce new products with more advanced machines and methods in order to provide competitive edge in the market. The goal of technological development is to achieve economic development and social development, which can also be regarded as the goal of science (Bal, 2010: 5).

1.1.1. Next Uncertainty and Schumpeter's Contributions

Joseph Schumpeter, after Keynes, had more influence on professional economic thought than any other economist in his own generation. Thus, it has the title of 'other great economist' of the first half of the twentieth century (Demir, 1950, 156). According to the statement of Alfred North Whitehead, the basis of the western philosophy is based on the views of Platon, and the view on which the research of technological development is based and which is proposed today is the explanation of Schumpeter. Schumpeter's analysis of the starting point of efforts to internalize technological development in economic theory has been. According to Schumpeter, big and important discoveries are a period of technological change (Hon, 2010: 6). Schumpeter has attributed the functioning of the capitalist system to technological changes and has stated that companies in competition are trying to maximize profits in this way. The new technical means, information, wealth and power within the

system of dynamism have increased social mobility, led to new social groupings, lifestyles and emergence of new values, prejudices have gained importance giving importance to economics. If we look at the increasing developments in technology, the center of the problem analysis is the problem of determining the source of subsequent progress. These developments are a process that we define as "learning by doing". The progression of progress has been made by accumulated outputs or accumulated outputs for many years. Alternatively, progressions may be limited to dependence on passage of a compulsory time to obtain information about the results of previous experiences (Bal, 2010: 7).

According to Schumpeter, doing something different in the flow of economic life is met with the term innovation. This concept is not the same as the invention. You do not have to have a scientific work for innovation. Schumpeter sharpens inventions and innovations. Invention and innovation are two sociological and economic things. It can be seen that they are often performed by the same person, but this does not affect the validity of the discrimination. While inventions are products of an intellectual effort, businessmen 's desire turns innovation into innovation. The two works are different from each other. Schumpeter sees innovation as a distinctive process of economic process and business activity; According to him, innovation can be the subject without anything that can be regarded as invention (Dolanay, 2009: 175).

1.2.The Technological Progress and Economic Growth Process

It is stated in the economic literature that the level of technology development between countries is one of the most important reasons of the economic growth differences and that the only way to grow economically in the long run is technological progress and that underdeveloped countries should attach importance to technological progress so that they can catch developed countries. The development of countries, scientific and technological progress as a result of reduced production costs and productivity is possible with increased. The most important problem in the emerging countries in the 21st century, when economic growth is based on natural resources and labor and is based on advanced technology and productivity, is the development of the ability to acquire, produce and use this advanced technology (Göçer, 2013: 118). While technological progress has given the firm a competitive edge in foreign trade, it provides the opportunity to buy better quality products and lower prices in the country. In this respect, it can be said that there is also a tendency to suppress inflation (Kiper, 2004: 64).

Many development theorists argue that the key to achieving development is that there is a continual growth in frontier economic growth based on numerical data across the country, such as the GNP, which requires concentration on industrialization, that technological and scientific development is sufficient to achieve economic growth on its own, and that the main determiner of economic growth is technological development . This is because industrialization reduces the import dependency by reducing the imports of goods and reduces the unit cost. The capital goods market, which is the product of the industrialist, has shown a linear relationship between investments and inventions, depending on whether the market attracts inventors, inventors to invent new machines and appliances (Bal, 2010: 13).

While technological development and innovation increase export growth and economic growth, it also helps companies increase their profits and market share. The externalities that come to fruition as a result of the companies' creation of human and physical capital, support long-term economic growth by providing increased returns on a scale (Göçer, 2013: 121).

1.3.Technical Progression on Economic Growth

One of the most important consequences of globalization on the world economy is intense competition in national and international markets. This intense competition is accompanied by many difficulties such as product quality, production technology, technological developments and increasing the standards in marketing, in the case of producers, although positive results such as cheaper prices in international markets arise for consumers. The most effective way to increase competitiveness in global markets by producing more efficiently and at lower cost is through technology. Companies that do not have the necessary technology and do not invest in the technology have to withdraw from the market after a while. For this reason, the concept of technology has become the most strategic concept

of the global world in terms of growth and competition in recent years (Kilic et al., 2011: 4).

The theoretical basis of the contribution of technological innovation to economic growth was first proposed by Schumpeter (1911) (Kibritçioğlu, 1998: 210). In Schumpeter's (1942) model of economic growth, innovations in firms and consumers have triggered innovation in production, consumption and transportation, advocating that those belonging to the old will be lifted, and formulated this process as "creative destructiveness." According to theory, economic growth will accelerate as a result of the natural increase in the amount of entrepreneurs. Although Schumpeter's theory of economic growth is considered effective and pioneer, it is quite difficult to be empirically formulated. More current theoretical studies on economic growth, in which technological development and innovation are used as variables, have been proposed by Solow (1956) and Romer (1986), empirically by Mansfield (1972) and Nadiri (1993).

In new growth models technology has a strategic precaution. By using technological developments and innovation as part of production factors, economies gain a competitive advantage over other economies with the productivity and cost advantages they provide. The required investment in technology and innovation and the necessary transformation in the production process on a country basis give positive results on economic growth in the long run. Innovation plays a critical role in China's high growth performance, which is one of the fastest growing economies in the world.

In addition to reducing productivity and innovation costs, technology and innovation can be used to increase efficiency and reduce costs, improve efficiency in raw material use, uncover new sources of raw materials, increase quality, maximize customer satisfaction, increase living standards, create new markets, ease entry into new markets, (Kılıç et al., 2011: 6), the provision of minimizations of firefighting, effective and efficient use of resources and the increase of entrepreneurship also affect the economic growth.

1.4. Technology Policies Applied in Turkey

Today, countries have a very different appearance in terms of ability to produce and obtain technology. At the basis of these differences are many factors such as the country's geographical location, cultural structure, education system. At the same time, the technology policies applied in those countries are very important in terms of activating the existing values. In Turkey, by examining the policies applied in this direction, more consistent policies towards the future can be produced from the inferences that will be made (Oğuztürk, 2004: 100).

From the declaration of the Republic until the beginning of 1960s, a certain policy in the field of science, technology and innovation was not observed in Turkey. The first studies on science, technology and innovation in Turkey started with the planned period. Following the establishment of the State Planning Organization (SPO) in 1962, the First Five-Year Development Plan (BBYKP) covering the years 1963-1967 was prepared and it was decided to establish the Scientific and Technical Research Council of Turkey (TUBITAK) in order to direct the scientific and technological activities of the country. In the Second and Third Five-Year Development Plans (1968-1977), technological development and technology transfer were discussed.

For the first time in the Fourth Five-Year Development Plan (1979-1983), technology policies were mentioned; emphasized that "technological policies should be taken as a whole together with industry, employment and investment policies, and that certain sectors should be developed in such a way as to produce their own technologies". The main policy pursued in the field of science, technology and innovation in the planned period covering the 1960s and 1970s is to support basic and applied research in natural sciences (Sat, 2005: 88).

At the end of the 1970s, it was decided to open the country out with a policy known as the decisions of January 24 to relieve the tight period of the country. With this policy, domestic producers in the developing countries have tried to realize the expectation that imports will take place, and "import substitution" has begun to be operated. However, exports have not been developed, followed by developing technologies outside the country can not be brought. Since a competitive environment could not be established within the country, the desired targets could not be achieved (Yıldız et al., 2010: 459).

The BTYK, which was established in 1983 but was able to hold its first meeting on October 9, 1989, to be rendered operational to a limited extent requires a new policy, titled "Turkish Science and Technology Policy: 1993-2003" It was possible in the period that started after the second meeting that gave the decision to approve the design and put it into practice. The decisions taken at this meeting clearly reflect the change in Turkey's science and technology policies. Up to this point, intentional and non-written policies aimed at establishing a science and technology infrastructure in Turkey have now directed science and technology to create social welfare and economic added value.

At the following seven meetings of the Board, decisions were made to identify and regulate the instruments for the creation of the National Innovation System, which is necessary to achieve this goal. However, science, technology and innovation policies have not succeeded because systematic integrity has not been achieved in this period (Kilic et al., 2011: 6).

In 2000, it was decided to prepare a science and technology policy document for the next 20 years of Turkey at the 6th BTYK meeting. Later in 2002, this document was prepared by BTYK and TUBITAK under the name of "Vision 2023 Project". The Eighth Five-Year Development Plan (2001-2005) was shaped around the need to identify the need to produce technological innovation. The Ninth Five-Year Development Plan (2007-2013) emphasized innovation and set out expectations for R & D investments and the number of researchers and what needs to be done to reach those expectations.

Although there have been no significant developments in science, technology and innovation in Turkey until the early 2000s, remarkable developments have started to take place thanks to the policies implemented since the beginning of the 2000s. These developments are the basic indicators of technology and innovation; It is possible to examine within the scope of variables such as R & D expenditure, R & D expenditure per person, number of R & D personnel, number of scientific publications, national and international patent applications and registrations and useful models and registrations (Kilic et al., 2011: 7).

CONCLUSION

Based on findings from this study; developing countries that aim for high and stable economic growth need to attach importance to technological progress. In this scope; it is necessary to establish a sound technological progress strategy, to prepare the necessary institutional and physical infrastructures in this regard, to allocate a larger share of R & D work, to improve human capital and industrial sub-structures to produce high-tech products and to provide additional evidence for foreign investors to transfer technology to the country. It will be.

Technology and innovation activities are all around the world as well as they provide growth, productivity and competitive advantage in Turkey. In order to ensure the continuity of these advantages, cooperation between the public and private sectors needs to be made in areas where expenditures are correct and in return. R & D is not just about product development. The work of others can also be done to understand the resulting ideas. For this reason, it is very important to understand the relationship between R & D expenditures, technological development and growth in Turkey.

Various public institutions are organizing project-based support programs in order to improve the competitiveness and entrepreneurship culture of private sector organizations with research, technology development and innovation ability. Community projects for this technology and innovation, carried out by various public institutions, universities and municipalities, should be increased.

In the underdeveloped regions of Turkey, a suitable environment should be provided to support technological knowledge production, commercialization and technology intensive investment and entrepreneurship in order to make the country's industry an internationally competitive structure. Priority should be given to sectors in which the international competitiveness of the country is high, in the determination of R & D and innovation support

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