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APPLICATION OF TECHNOLOGY POLICIES IN TURKEY

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ABSTRACT

In the global world, the topic requiring development in technology has a great importance. Countries present very different perspectives in terms of the capacity of producing and obtaining technology. A lot of factors such as geographical position, cultural structure, educational system of the countries lie behind these differences. Technology policies of a country at macro level affect economic growth, efficiency, employment, intercountry income distribution, foreign trade and cyclical fluctuates and economic policy while effects of the same at micro level appear in cost and price structure. Technology policies play an effective role in educational system, understanding of society, social structure, tradition of industry and advanced technology use and habits of production and experience of all of them and a lot of other parameters. Besides, the technology policies applied in Turkey are very important for the activation of the current values. The concept of competition based on producing more consistent policies, accelerating, and with respect to this, rapid technological development for the future from the inferences to be made by examining the policies applied is gaining a new dimension, and the concept of competition based on cheap labor and natural resources is substituted by production technologies competitive in international markets. Turkey, by closely following the developments regarding technology within the country or in the world, should be able to readjust its technology policy depending on the developments and also provide its technology policies to be forward looking, long and stable. The objective of the study is to reveal how the technological progress will be possible with the progressions in the subtopics to be determined by means of the analysis of the concepts regarding technology and detection of their importance.

Keywords: Technology, technology policies, Turkey.
JEL Codes: L10

1. INTRODUCTION

In the globalizing world, the increasing technological innovations among countries and the use of these innovations in all aspects of everyday life are increasing the importance of science and technology policies in order to reach the social and economic development targets of the countries in today's competitive environment. It is important to know the hurdles in front of the factors that increase the use of technology, the international technology standards and the technology policies that will guide the spread of technology within the society and the adoption of it by the individuals.

Increasing the welfare level of a country and its ability to compete in the global market depends on its ability to develop products and production methods based on Research and Development (R & D) and advanced technology, and success it shows in science and technology. Because the most important factor for increasing economic development, countries' competitive power and social welfare is the progress and technological developments in scientific fields. The application of the progress and development in these areas to the production process of countries also brings with it development. In addition, technology and industrial policies need to be improved by looking at the conditions of a country, its current position in the global structure and its advantages.

Turkey's quest for science and technology has been going on for nearly forty years. Although Turkey has gone so far in this process, the desired level has not been reached yet. To increase its share in the world trade, close the big gap with information societies, rise from its semi-industrialized position as soon as possible, become an industrial society that can produce its own technology and be able to have a say in the technology race, Turkey has to determine the right science and technology policies and implement these policies to all the layers of the society with continuity.

2. THEORETICAL FRAMEWORK

We can say that a large portion of the rapid change occurring in today's world is caused by the developments in science and technology, and that our world is shaped by new technologies. Therefore, we can expect that technological change and therefore social, economic and political changes will take place at the same pace. However, it appears before us as an extremely important issue to think about alternatives to the present situation for a future we desire which we will determine with conscious preferences we will make starting from the question "what kind of a future do we want?", to look for ways to realize these alternatives, and accordingly to reveal our preferences about science and technology and to predict their effects. Technological innovation in this context gains importance not only as a way of enhancing the prosperity, in the narrow sense, the welfare, of the nations, but with its property that will enable people to do that has never been done before. The topic of the work, that is, technology policy, is directly related to the policy of scientific research and R & D expenditure and is a part or the result of them. Other important components of this policy are the number of patent applications of Turkey and the level of Turkey's high technology exports and imports. Technology policy can be functional and successful at the level of Turkey's brainpower and the financial contributions of developed countries. Institutional and legal regulations are needed to make technology policy functional and successful.

3. PURPOSE

The purposes of this study can be summarized in two headings. The first is to describe the science-technology-oriented deficits resulting from Turkey's weak R & D activities taking into account the science and advanced technology level of developed countries. Second: to emphasize that Turkey should not ignore the technology policy while competing with developed and developing countries in the global economy and thus reveal the causes, conditions and conclusions of the technological policies.

4.TECHNOLOGY CONCEPT

Technology Description

The concept of technology needs to be defined before examining the politics that determine Turkey's technology direction. Technology in a very general sense is defined as the application of information to meet human needs and at the same time the methods used in production. Technology can be expressed as "production-science" in Turkish. Technology is the production knowledge that is used or can be used in the production of goods and services, and the ability to produce and use of this knowledge. If a more appropriate definition in terms of production management is needed, it can be defined as "a system of processes, tools, equipment and machines used to produce goods and services". Technology, as the fastest changing element of the general environment, also reveals production ways and processes, changes and developments in machines used, as well as uncertainty and risk. Technology prepares the conditions necessary for the transformation of knowledge into a productive power, the reflections of automation, robotics, and information fields on the production processes and the transition to a new and advanced social formation. Technology can be expressed in two different ways, first as non-material, i.e. technical knowledge, and second as physical and material elements. Modern technologies are total quality management, in other words, management technologies (Çiftçi, 2004). It is possible to classify modern technologies, production management and method techniques as management technologies and computer-assisted equipment as engineering technologies. In addition, new technologies are gathered under two main headings. These are high R & D intensity technologies, information technologies, microelectronics (integrated circuits, computer manufacturing, robots, quality control techniques),the use of computers, information processing technologies, telecommunication technologies (space, communication technologies, remote sensing, video, telefax, service-related technologies), new materials (advanced ceramics, new plastics, new composites, new metals, optical glasses, high temperature materials, semiconductors, rare earth metals) and new technologies obtained with R&D are biotechnology (gene technologies, chemical biotechnology, biomedical, agricultural biotechnology) and energy technologies (fossil fuels, bioenergy, nuclear energy, wind energy, solar energy). R & D activities require trained staff, a high level of knowledge and a high level of financial transfer. Countries give importance to science and technology in order to develop, to produce better goods and services, to meet their needs by using fewer resources. Technology constitutes a major source of all areas of the economy, and these technologies take on important functions in strategy determination, enabling the expansion of services and the quality of services. Economic policies in accordance with the strategies, concrete and coherent strategies, efficient allocation and use of resource and a national technology policy that includes structures suitable with governance are indispensable elements for nations (Laporte, Robert, J. 2002).

5. CURRENT STATE

R & D Expenditures, Patent Production, Advanced Technology Exports

In this section, R & D expenditures related to developed and developing countries and Turkey have been examined comparatively with respect to imports and exports on the basis of patent production and technology products.

5.1. R&D Expenditures

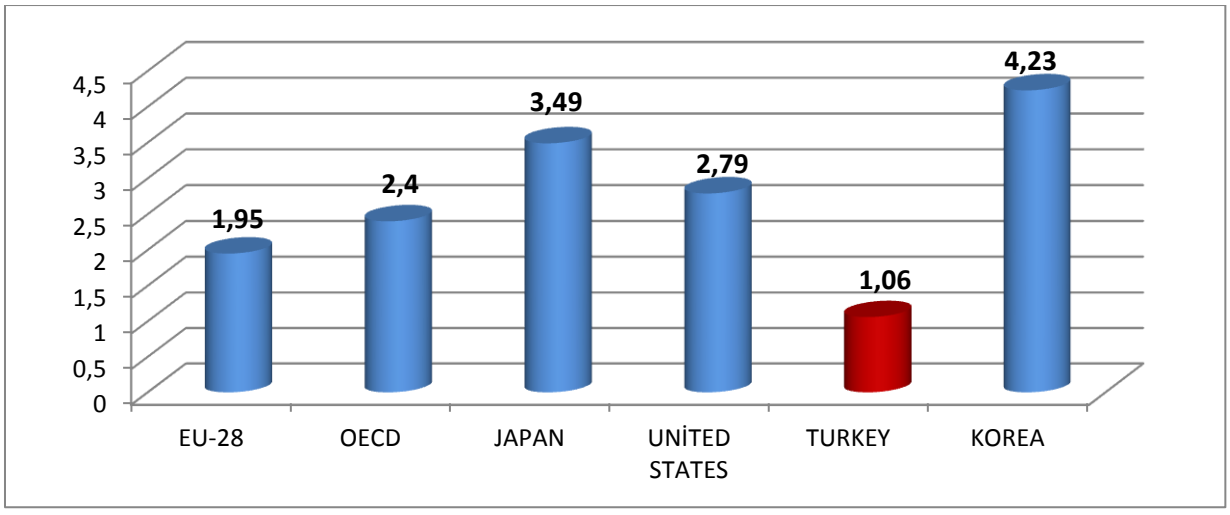
The abundance of R & D expenditures in a country shows the importance that country places on science and technology policies. R & D system consists of three main parts as basic researches, applied researches and innovation. The shares of total R & D expenditures allocated to these parts in developed countries: 15-20% for basic researches, 20-25% for applied researches and 55-65% for innovation. Funding for basic research is provided by the public (state), 50% of the funding for applied researches is financed by the public and the other 50% by the private sector and for the innovation, >90% of the funding is provided by the private sector. Worldwide thresholds for R & D expenditures were at least 1% in the 1970s and 2% in 2010, while the optimum value was > 2% in the 1970s and >3% in 2010, Turkey's share of R & D expenditure in gross domestic product (GDP) in 2014 was 1.01% according to Turkish Statistical Institute's (TUIK) data.

In addition to the expenditures allocated to R & D, it is also very important that these expenditures are made effectively. Entrepreneurship and creativity should be encouraged in Turkey. Technology support and development centers should be established. Universities that are the centers of excellence should be established. Hatcheries and techno cities centered on public and R & D units should be established. The number of techno parks and similar opportunities should be increased. Policies regarding the establishment of appropriate financing institutions and risk capital companies should be determined within a certain consistency and must be applied.

The share of personnel employed in the R & D sector in general employment within a country is an indication of the importance and support given to science in that country (Adaçay, 2007). If a country or firm wishes to successfully execute R & D activities, obtain effective results, and gain competitive advantage, they need to employ more R & D personnel in terms of quantity and quality. Today, the level of development of countries' economies is measured by high technology exports, information communication expenditures, scientific publications, number of patents and trademarks, R & D employment and indicators. Developed countries try to keep R & D's share in GDP high.

There is a constant parallel relationship between financing allocated to the R & D area from gross domestic product and scientific-technological development and therefore economic growth. In Turkey, the political staff who are aware of the importance of science-technology and innovation have been trying to realize scientific and technological progress, but the inadequacy of coordination among institutions lowers the chances of the policies implemented being successful. As it is clear from the data of 2015 (Figure 1), Korea is the first country with the highest R & D expenditure at 4.23%, followed by Japan at 3, 49%, followed by the USA at 2.79% (OECD, 2015). R & D expenditure, which is a critical element for scientific and technological development is 1.01% in 2014 in Turkey while its share in GDP is 1.06% in 2015.

Figure 1: R & D Expenditures (% of GDP) 2015



Source: OECD, 2015 data (http://stats.oecd.org/viewhtml.aspx?datasetcode=MSTI_PUB&lang=en)

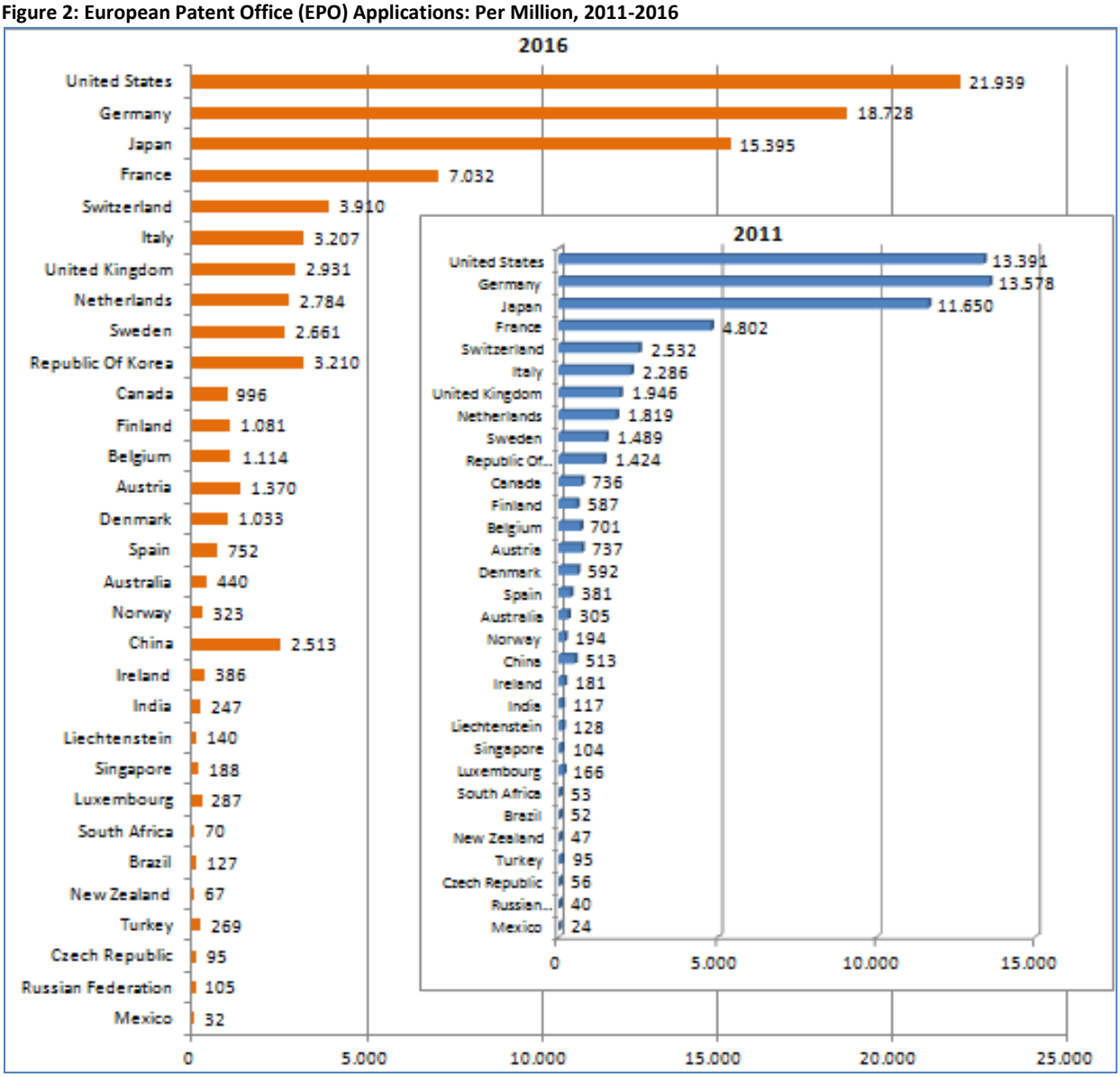
5.2. Patent Production

The EU is composed of industries with strong industrial and service sectors and therefore high levels of development. The EU has a relatively low performance compared to the US and Japan at the patent production scale. The European Patent Office (EPO) and the US Patent and Trademark Office (USPTO) highlight the controversy over quantitative aspects of technology competition between EU countries, the United States and Japan. According to EPO statistics, Germany lags behind the US but is ahead of Japan. According to USPTO statistics, on the contrary, the EU's patenting performance is

generally three times lower than the US and Japan on average. The reason why these results are different from each other is that the country sources of patent offices are different.

In terms of the number of patent applications made to EPO in 2016, the USA ranks first with 21,939. It is followed by Germany with 18,728, followed by Japan in the third rank with 15,395. According to the increase (growth) rates in the patent application, the performances of the countries vary according to the averages of the years 2011-2016. For example, Turkey, which made the highest number of patent applications per million people in 2011, increased the number of patents from 95 per million in 2011 to 269 in 2016 with slow and confident steps and increased this number by 9%. While the number of patents in China was 513 in 2011, it increased the number of patents over the years steadily with the number of 2513 patents in 2016 (Figure 2).

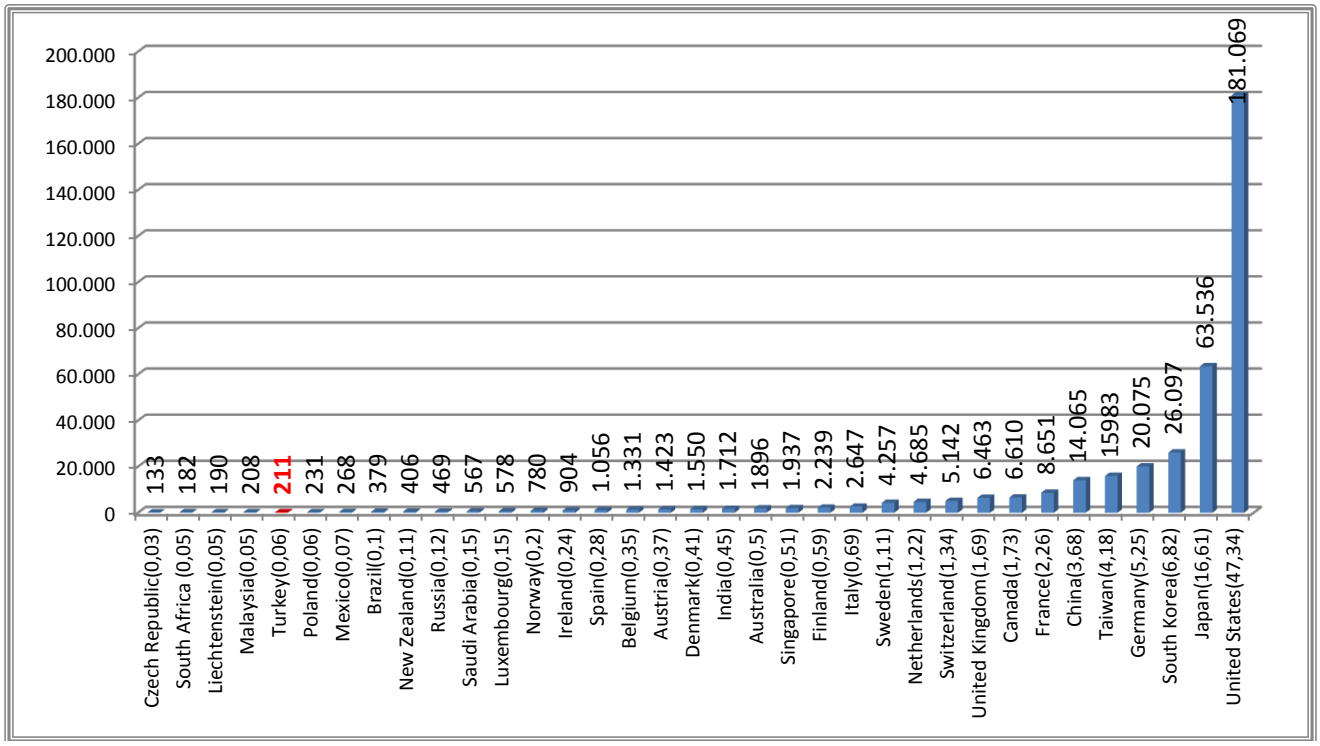
Figure 2: European Patent Office (EPO) Applications: Per Million, 2011-2016



Source: OECD, 2011-2016 data (http://stats.oecd.org/viewhtml.aspx?datasetcode=MSTI_PUB&lang=en)

According to the USPTO's approved list of patents in the year 2015 (Figure 3), the US was ranked first with 181,069 patents per million people, followed by Japan with 63,536 patents, and South Korea with 26,097. The number of patents Turkey received from USPTO is 211 and is at a very low level. According to the growth rates of the patents compared with previous years, the US has improved by 47%, while Turkey has made a progress of around 0, 06%.

Figure 3: Number of Patents Approved by US Patent Office (USPTO) Per Million People, 2015.



Source: (2015). "European Commission, European Statistics"(Prepared by utilizing from data of The World Bank, OECD, EUROSTAT)

Nowadays, a measure that is taken into consideration in determining the country's international patent number and their economic value is that the approval from a patent office should also be approved by others. To this end, in order to increase the efficiency of the global patent system, a triple patent system based on EPO, USPTO Japanese Patent Office (JPO) has been developed. The main reason for the development of the triple patenting system is that not all patents have the same value. One way to describe the high commercial value of patents is to test them through "triple patenting". Thus, patented innovations can be searched and found in three different patent offices. The US, with the comfort of being in its own domestic market, plays a dominant role in its own patenting system while the European investors have a dominant role in the EPO (EU Commission, 2004). Furthermore, a quintet patenting system (IP5) was developed composing of EPO, USPTO, JPO, Korea Intellectual Property Office (KIPO) and the State Intellectual Property Office (SIPO). The data is based on the latest world-wide patent information from the WIPO Statistical Database. Thanks to this system, Patent Activities around the world and patent competition among countries are on a more objective basis. While the world sees the absence of economic barriers between the nations, the innovators want their intellectual works to be preserved simultaneously in multiple large markets.

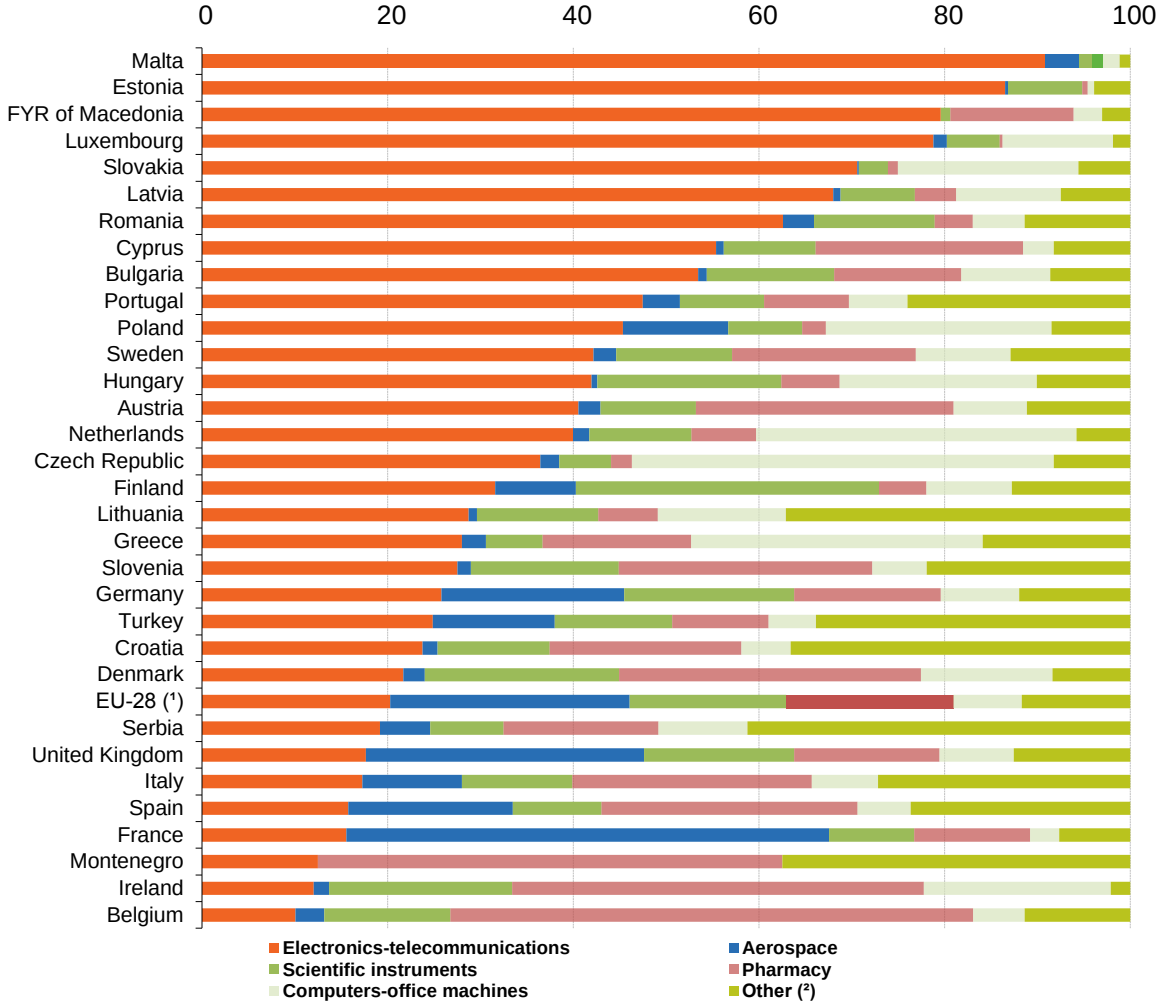
5.3. Technology Exports and Imports

Exports of high technology products reflect the ability of a country to commercialize the results of research and the outcomes of technological innovations in international markets. High technology industries have the largest share of international trade and help dynamically increase performance in other sectors.

According to detailed Graph 4, where the total exports share of technological products is comparatively projected, high-tech products represent 17.0% of all exports from EU-28 in 2014, while the 35.3% share in Malta is only 2.9% in Greece. There is a wide variation observed among countries. The two product lines together with electronics, telecommunications and aviation accounted for almost half (47.1%) of EU high technology exports. The other 42.0% comes from scientific instruments, computer-bureau machines and pharmacy. The remaining four product groups, i.e. chemistry, electrical machinery, non-electrical machinery and arms, have a share of only 10.9%. In terms of value, Germany is the high-tech exporter of the EU to the rest of the world in 2015, followed by the Netherlands, France and the UK. Seven countries; Belgium, Denmark, Germany, Ireland, France, the Netherlands and Austria, have given high-tech trade surpluses. In 2015,

more than two-thirds of countries upgraded their exports of high technology compared with 2014 levels. However, the EU registered a high-tech trade deficit in 2015 and imports were around 22 billion Euros higher than exports.

Grafik 4: High-tech exports by high-technology group of products, EU-28 and selected countries, 2014, in %



Source: EUROSTAT (2014). "European Commission, European Statistics"

In Turkey(according to Foreign Trade Statistics, December 2016) , the share of manufacturing industry products in total imports is 82.9%, the share of high technology products in manufacturing industry is 16.7% and the share of medium high technology products in imports is 42.5% in 2016. The countries where Turkey imports the most are China, Germany, Russia and Italy respectively.

6. THE IMPORTANCE OF SCIENCE AND TECHNOLOGY POLICIES

Until the last twenty years, because of the fact that in the traditional economic theories technology and knowledge have not been regarded as an instrument of economic policy since they are regarded as data; technology policies have directly affected the prosperity and progress of the countries, therefore all countries are in a competitive effort to reach, use and develop technology. However, with the influence of internal growth theories, the idea that information and technology should directly influence economic performance and be used as a policy tool came to forefront and the role of technology and innovations in economic analysis began to be examined in detail. Two centuries ago, Adam Smith emphasized the importance of nations' policies and institutions, suggesting that the major differences per capita are socioeconomic and political policies (Johnson, 2000).

While the technology is spreading rapidly in the global economy, it is necessary for the nations to systematically develop and produce policies in order that the production of information and technologies can be effective and economical results can be achieved with the importance given to science and researching. This can be achieved through the development of technical training and the development of production and technology policies by making the production system compatible in accordance with these targets. In developed countries, the capacity of technology and the size of the efforts enable these countries export technology, while underdeveloped countries are technologically dependent due to the inadequate efforts and low technologic capacities. All countries desire to have new technologies that are the most important factor in their ability to compete internationally, and there are two ways of achieving technological advancement: the first is to acquire technology by transfer, in other words to buy new technology from other countries; the second is to develop and produce the technology within the country (Ağır, 2010). In developing countries, this is usually in the form of technology transfer. Lately, there have been many developments in the direction of change. Generally, appropriate new technologies are selected and efforts are made, although some problems are encountered for the adaptation, application, dissemination, and production at a higher level of the selected technology. The more effort is put into innovation, the more positive developments it will have on innovation. The modern process of innovation in science and technology is based on business, and these innovations affect long-term growth, the tax base and the balance of payments. Stable economic policy implementations of countries influence the technology in a positive way, and implementation of these policies systematically throughout the country, continuity and political stability is an important milestone. Whether science and technology policies are effective is closely linked to determined program objectives and targets must be consistent in order for this relationship to be meaningful.

In the developing and changing world, the technology policies of countries should not be considered independently of economic and institutional contents. The educational system of the countries and the public and private R & D activities constitute the technological infrastructure composed of networks of scientific and technological organizations and the infrastructure depends on the internal function of the efficiency system and how the factors and the goods market react to innovations. Countries that follow mission-focused technology policies allocate funds in large amounts to defense spending and R & D to achieve strategic leadership among nations. The most important features of these countries are concentrated in producing innovation and technology, they are centralized in decision-making, and they spend too much on space and nuclear energy programs (Ergas, 1995).

That is why today, whether a developing country or a developed country, every country seeking to gain competitive advantage in world markets, thus increasing market share, sustaining economic and social development, and desiring to be effective in tomorrow's world, has a national policy aimed at becoming more skilled in science, technology and technological innovation, or aiming at higher levels of today's competence.

Competition and development of an international country in today's conditions depends on such factors as the number of researchers, scientists and engineers, scientific publications, technological performances, the number of patents, advanced technology exports and the share of R & D in GDP. This is reflected in the structure of exports and low value added goods production and exports constitute one of the main causes of the current account deficit problem. With the long-term strategic approach, realistic / realizable projections and stable applications, innovation, branding, accelerating patents and technological development, rehabilitation of national innovation and education system, R & D staff number and quality improvement, R & D / GDP ratio and increasing private sector contribution should be the priority policy. Countries in the world are now investing in these areas, even in the EU, which is experiencing difficult times due to the debt crisis; investments to be made in R & D and innovation are regarded as a way out of the crisis.

If we try to find an answer to the question of how political will can be created, it should be remembered that a problem has often not just one, but various technological solutions, and each solution has some strengths and weaknesses. If it is desired to create a sustainable future, it seems necessary that the issue of equal distribution of resources be treated with great seriousness and technological choices should be made accordingly. When measuring the contribution of technological innovation to the economy, it is necessary to develop important criteria from the nature of the production activity to the forms of employment. While technical employees, engineers, scientists and anyone involved in the decision-making process in technical matters choose between various technological alternatives, they should consider the advantages and disadvantages of each alternative not only based on technical criteria, but also in terms of long-term sustainable, desirable and qualified living criteria, that is to say, the social, political, economic, environmental and even psychological effects of technological choices must be taken into account. It is clear that the development of technology, the need for technological innovations and development will continue since technological preferences shape not only the economy, but the whole future.

7. TECHNOLOGY POLICIES IN DEVELOPED COUNTRIES

Developed countries have succeeded in gaining competence in technology by fulfilling the systematic nature of many policy areas, from industrial policies to investment policies, from education policies to economic policies. Scientific and

technological improvements, which are among the main factors determining the competitive advantages of the nations in the rapidly globalizing world economy, are not left to their own dynamics and the conscious efforts of industrialized countries and the search for policy making have been intensifying. An important reason for this is the extraordinary proliferation of technical information in the database, while another crucial reason is the search to increase international competitiveness. Science and technology policies in developed OECD countries are based on competing in international markets by developing technological infrastructure and dynamics rather than labor, capital, natural resources and equipment (Yücel, 2006). Applicability and expansion of the social benefit ground (technology, health, economy, environment, energy, employment, transport) can be achieved consistently only with a policy that directly includes the state (USA example) so that these policies will serve both concurrent and long-term goals. In short, developed countries have resorted to the state machine with no hesitation; as long as it is necessary and in necessary measurements, as a rational tool to effectively implement the technology policy. In Germany, for example, the state is tasked with increasing the volume and potential of R & D in small-scale industries, supporting technological innovations and business incubators, establishing and encouraging reward system and industry-university cooperation. The state leads the private sector itself in creating innovations in order to test and formalize innovations (Ergas, 1995).

In order for developing countries to be at the same level as developed countries in terms of success, they need to follow the policies of importing and adapting existing technologies to domestic conditions. In this context, along with the process of acquiring new technology, it is necessary for developing countries to be able to develop, implement and succeed in the necessary institutional renewal, and more importantly, it is of utmost importance that these countries adhere strictly to the economic elements that constitute both the basis and the framework of high- tech policies. For example, Japan has a technology policy that is highly interactive in terms of international integration. In the process of globalization, Japanese politicians, rather than having no policies, have brought the technology policies to an international level to maintain national targets.

In order to close the technology gap between developed and developing countries, in the framework of formulation, the first step to be able to learn and adopt new technology and to use it by disseminating it to the relevant activity areas of the economy and to gain the ability to reproduce at a high level is to provide an education and training system that encompasses the industry, the university and the state that will make it possible to place this process on a regular and systematic basis as a whole and the rate allocated to R & D needs to catch rates in developed countries. Science is, to some extent, international, but the development of technology and the formation of R & D are national concepts.

8. TECHNOLOGY POLICIES IN TURKEY

Since the Turkish economy has been operating in a protected and closed system until recently and the industrial production activities have been carried out in the form of technology transfer, it is observed that the industry does not make much effort to produce technology in the development process since it is also not possible for industrials in production in a closed economy environment to be involved in R & D activities. In the 1980s and 1990s, with the change in the economic system, the protectionist approach in the economy was abandoned and the outward opening started and import substitute policies were abandoned and open foreign economic policies were accepted. As a result, all economic units, primarily private sector firms, began to pursue scientific and technological developments more intensively in search of innovation and product development context. The struggle of globalization and economic integration approaches to protect and increase the competitiveness of firms has begun to direct the companies towards technological change more. Within this process, with the rapid increase in the level of technology transfer, this new era in which the private sector gains weight is important but it is mainly developed in the form of direct technology transfer. The positive developments in the 1990s provided important contributions to the country's production structure, competitive strength and export performance compared to previous periods in various dimensions. However, it is clear that all these developments lag behind the desired levels. One of the most important factors behind the scenes of limited development is the lack of demonstrated performance in the context of science and technology policies. In this period, various steps were taken in order to create a science and technology policy for Turkey.

If we examine the recent periods, there are many developments in the field of science and technology that operate nationally or internationally. The most important of these formations and the controller of other formations is TÜBİTAK. Granting and giving loans to R & D activities by TÜBİTAK-TİDEB and TTGV, which are the financing of R & D investments that are considered as the building blocks of the national innovation system, triggered efforts to establish R & D and innovation culture beyond financial support (Alparslan et al. 2008). The contribution of the state to private sector's R & D expenditures in 1995 helped increase the R & D activities of this sector and it was possible to establish a national network by preparing an information infrastructure master plan. Due to the lack of a holistic approach, flexible production and automation are lagging behind the expected targets (DPT, 2000).

In the perspective of historical development, the Turkish economy failed to catch up with the technological transformation processes in time, and remained behind in terms of adaptation processes. As can be understood from the sectoral

distribution of the GNP, when the economic structure in which the steps taken to become an industrial society is not matured enough, faced the problem of catching the contemporary civilizations that became the information societies, there occurred dilemmas which led the economy's production structure and development process and export sectors' competitiveness to be below the desired level.

More attention should be given to science and technology in order to bring the economic and social development of our country to a more advanced stage and to turn into a knowledge society quickly. This suggests that Turkey needs to take a number of measures in order to increase its competitive power and prosperity level. Serious policy designs have been put forward in Turkey, but since they have not been handled systematically and decisively, growth targets could not be achieved, sufficient success could not be achieved in export-import, and some of the planned targets could not be achieved. All of these show that enough importance has not been shown to this field which requires long-term strategic approach. The countries, for example Korea, which realized that the development projects, no matter how good they are, will not make any sense without necessary human sources, made investments in human resources since then and started to raise students that they would benefit from in the "Reverse Engineering" project in the future.

9. CONCLUSION

The aim of this study is to examine Turkey's level of technology during the European Union accession process, and this study also revealed that technology is one of the most important subjects of economic policy. Considering the practical works and the level reached in the last 20-25 years in the theory of economics, it can be seen that information, especially technology is not a free product other than the one specified in the classical economic theory and that it costs a certain amount and therefore it is an essential factor for economics, prosperity and production. It is indisputable that the basic driving force of production, thus growing is technology. Nevertheless, it is seen that the progress technology has shown has not emerged as a result of a mechanical process. The production and use of information and technology need to be done in a certain system and coordination. Therefore, it is an inevitable necessity for Turkey to develop its national information, innovation and technology systems with its policy instruments by determining its technology policies. It can clearly be observed that Turkey's technology infrastructure is far behind the EU countries in particular and OECD countries in general. In order for Turkey to adapt to the developments that take place in science and technology in the world, basic scientific and technological policies must be updated and applied in a timely manner, and the shares of particularly education, R&D and scientific expenditures in GNP must be increased in absolute terms.

In order for a qualified technology policy to be implemented effectively and to be able to move the parties to a competitive level, the monetary resource problem must first be solved. Even if governments change, technology policy is the leading one of policies that need to be developed and maintained. Technology policy has to be a contemporary, effective and sustainable policy by nature.

Technology development areas designed to encourage the establishment and development of high technology and knowledge-based industrial firms should be increased and innovation efforts should be accelerated. Innovation and R & D potential in technology should be uncovered, and factors that increase the competitiveness of the region should be focused on. R & D centers play an important role in terms of regional and national development, so the number of these centers should be increased. Training programs should be organized to reduce the lack of information on R & D and innovation support. Innovation studies in universities should be encouraged and these subjects should be included in the curriculum. Innovation and R & D-focused platforms that bring academics and companies together should frequently be organized.

In order to increase the university-industry cooperation, the studies carried out in the universities should be effectively transferred to the industrial sector. Emphasis should be placed on improving the number of qualified labor and researchers who can be employed in the field of science and technology. Works towards the establishment of R & D units within companies should be carried out.

The introduction and implementation of effective policies in a systematic and coordinated manner for the production and use of information and technology is of great importance to bring the level of development to the desired level. Science and technology are one of the most important elements of long-term economic and social development, while science and technology policies are a tool to influence the speed and direction of this development.

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