

## An Investigation on the Scientific Products: Iran, Turkey, and Greece

Maryam Kazerani<sup>1,\*</sup>, Ali Salahi Yekta<sup>2</sup>, Sudabeh Nowzari<sup>3</sup>

<sup>1</sup>Department of Medical Library and Information Science, Faculty of Paramedical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

<sup>2</sup>Department of English, Faculty of Paramedical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

<sup>3</sup>National Library of Iran, Tehran, Iran.

\*Corresponding Author: e-mail address: [Kazerani.m@gmail.com](mailto:Kazerani.m@gmail.com) (M.Kazerani)

### ABSTRACT

The present study seeks to investigate the scientific products among the three countries of Islamic Republic of Iran, Turkey, and Greece as they have entered the 3<sup>rd</sup> Millennium (during the years 2000-2008) upon the data obtained from ISI Web of Science. In the past, these nations had possessed original, rich, and great civilizations; moreover, these countries had had (and still have) borders with each other so that Iran reflects itself as an Asian nation, Turkey as that of a Euro-Asian country, and Greece as a European nation. The findings show that at the turn of the 3<sup>rd</sup> Millennium (the year 2000); Turkey and Greece (with a little difference) had a higher level for the scientific products followed by Iran with a significant difference. After four years (in the year 2004), Turkey had taken the lead, followed by Greece and Iran. However, in the year 2008, Turkey had still had the lead in the generation of scientific products, while Iran had surpassed Greece.

**Keywords:** Scientific products; Iran; Turkey; Greece

### INTRODUCTION

Since the time Francis Bacon stated that "Knowledge itself is Power", numerous scholars have spoken of the importance, application, and the key roles of the search of knowledge. The basis of their opinions refers to Bacon's statement that the generation of science is the basis of knowledge, and knowledge is the basis of power. In the meantime, some terms and statements are used to define the present era, including 'the post-industrial age', 'the age of communication', 'the age of science and technology', 'the age of globalization', etc. The essence of all of these statements is that science and knowledge are the bases of developments in nations; moreover, it is said that it relates to human destiny more than ever (1). In other words, we live in an era whose engine is powered by knowledge and science, producing the most high-tech industry based on the highest degree of expertise.

A stable development depends on the generation of knowledge and science, as the

generation of science enhances the growth of knowledge. This will prepare the grounds for technology, which will in turn provide jobs, wealth, and eventually provides comfort, and social security. USA, UK, Japan, France, Italy, Germany, and Canada, also known as the 7 industrialized nations, are today at the center of the global knowledge due to their scientific products. This has all been possible due to the relation these countries have provided between generating science and technology on the one hand and developing a dynamic national economy on the other. Therefore, the generation of science is an index by which the provision of development can be defined among different nations.

Knowledge is an institutional asset with a lot of potential efficiencies, so that today knowledge is a must for any institution's development. In the present era, the economic superpowers are those that have generated the greatest amount of knowledge, though the generation of knowledge has had different and various forms in different nations. The

comparison of such forms between the Asian and European countries involves a lot of controversies. The non-scientific suggestions show that the generation of knowledge is considerable in some Asian nations with significant differences in different years. The comparison of the condition of the generation of knowledge in the countries with their neighboring nations with a similar cultural and geographic condition needs a lot of discussions. The present study seeks to compare the condition of scientific products in a European country (Greece), and an Asian country (Iran), and a Euro-Asian country (Turkey) during 2000-2008 based on the data provided by ISI Web of Science. These three nations have similar borders, and follow more or less similar cultural and local characteristics. Moreover, the three nations have had rather similar historical conditions, and are considered as possessing rich, original, and developed civilizations which could provide better grounds for studying the generation of knowledge among them.

## MATERIALS AND METHODS

The present study has tried to descriptively assess the condition of scientific products in Iran, Turkey, and Greece during 2000-2008 based on the ISI Web of Science reports. Date of data extraction was in March, 2009. The search strategy in ISI Web of Science was  $py =$  (the year of products) +  $CU =$  (name of producer country). We descriptively analyzed 286904 data by Excel: Iran: 56836; Turkey: 136829; Greece: 93239.

## RESULTS

The results of the data analyses are presented that Iran's scientific products during 2000-2008 (Figure 1) show a growing trend. The growth has been gradual at the turn of the century, while during 2006-2008 it manifests rather sharp increase.

Turkey's scientific products during 2000-2008 (Figure 2) show a growing trend like Iran's scientific products and so growth has been gradual with a similar tone but In 2008, a sudden growth is seen a tone but In 2008, a sudden growth is seen a although the rate of scientific products in Turkey is considerable.

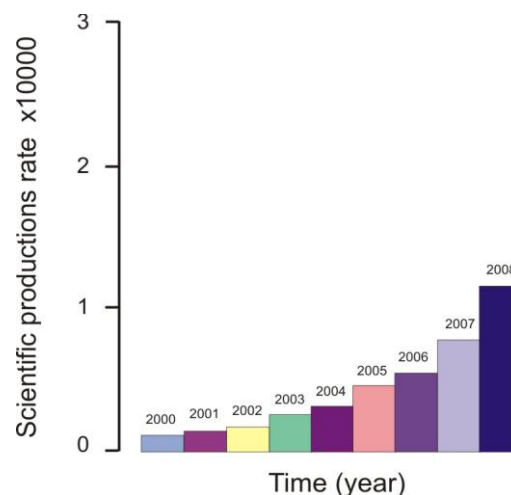


Figure 1. Iran's scientific products during 2000-2008

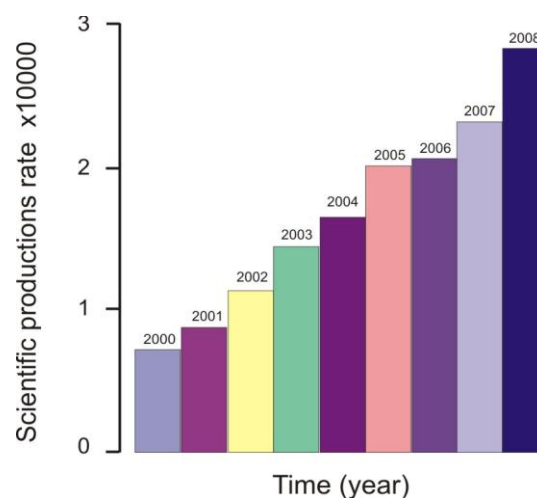


Figure 2. Turkey's scientific products during 2000-2008.

According to findings in Figure 3, Greece's scientific products during 2000-2008, show a rather similar growth although the rate of scientific products is not considerable as a European country in confers with Turkey as a Euro-Asian country.

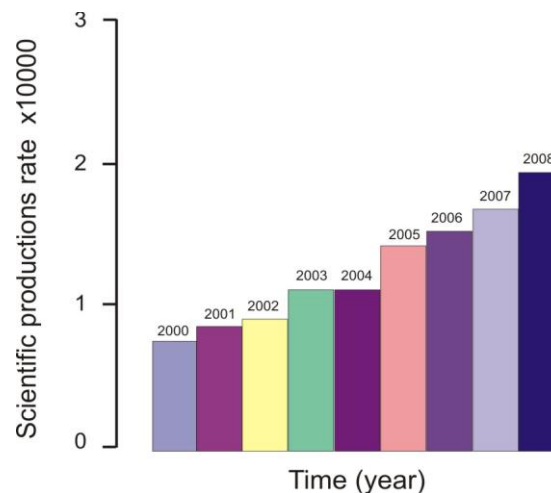
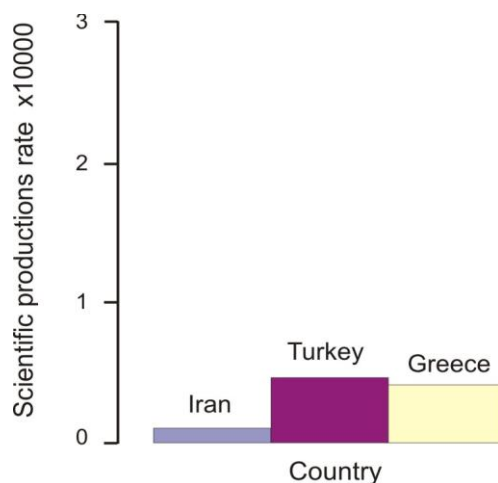


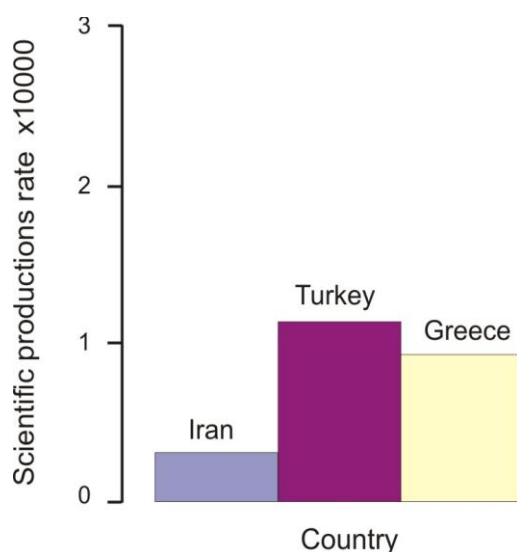
Figure 3. Greece's scientific products during 2000-2008

In the year 2000, we can see that Turkey had the highest amount of products (6595), while Iran had produced the lowest amount (1611); Greece, with 6338 products, shows just a little lower than Turkey. (Figure 4).



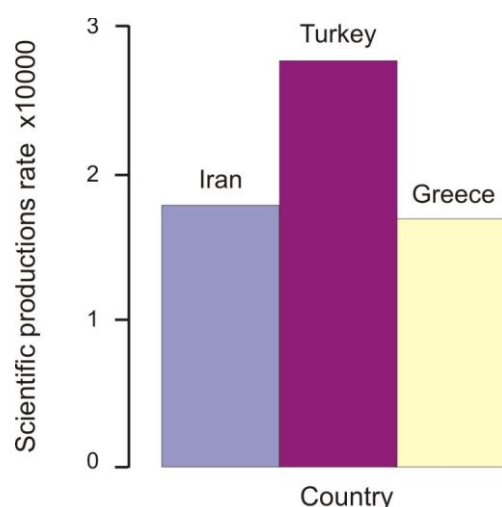
**Figure 4.** The quantity of scientific products of Iran, Turkey and Greece in the year 2000

As it can be seen in Figure 5, the difference in the amount of the scientific products of the three nations is depicted for the year 2004. Turkey had the highest amount (numbers) (14781 documents), and Iran had the fewest number (4567 documents), and Greece, with 9227 documents, occupied the mid position. The difference between Turkey and Greece is significant in 2004. However, the amount of the products of Iran and Turkey had decreased compared with their products in the year 2000.



**Figure 5.** The quantity of scientific products of Iran, Turkey, and Greece in the year 2004.

In Figure 6, the differences in the amount of the scientific products of Iran, Turkey, and Greece for the year 2008 are shown. In 2008, Turkey with the highest amount of products (25654 documents) has been on the lead, while Greece had produced the fewest numbers (15682 documents). Iran has promoted its position, from the third rank to the second, by publishing a total of 15682 scholarly documents. We can say that during the years under study, Turkey has had the greatest number of products. Except in the year 2008, where Iran ranked the second, in other years Greece ranked the second.



**Figure 6.** The quantity of scientific products of Iran, Turkey, and Greece in the year 2008

## DISCUSSION

Science is an important part of human activity and also important for its economic return. Production of science is being measured by many investigators and sometimes the result can be helpful for broad scientific decisions and it is often useful to make a comparison between scientific products of countries to show differences and after that, sometimes we can talk and analyze the causes of progress or lack of progress in countries according to scientific product rates. For example, Jokar & Ebrahimi (2004), in their article "The Tendency of Other Nations in Citing Iranian Scientific Products", studied the scientific products generated by Iranians (based on the ISI Institute) during 1990-2006 using the citation function. They have determined the

nationality of the authors who have referred to Iranian scientific products. Their results show that more than 50 % of the citations had been by Iranian researchers, while 49 % had been by people from other nations. The total amount of their scientific products had been 30146 during the same period (2). Sotoodeh (2004), in an article entitled "Mathew effects on the Scientific Functions of the Nations with an Emphasis of the Middle East" depicted the Mathew effects in three groups of nations using a regression analysis. The nations included the Middle-Eastern countries, the ASAN countries, and the member nations of the Organization for Development of Economic Cooperation. The findings showed that the latter groups of nations have benefited the most, while the negative Mathew effects phenomenon on the nations under study did not allow the change in their country to establish a harmony with changes happening in other scientific products. Moreover, the scientific functions of countries such as Israel, Cypress, Sudan, Syria, and Lebanon had been much more than expected, and they rank the highest among the Middle-Eastern nations. As for the Impact Factor, Turkey, and Egypt ranked the seventh and eighth places, while Iran, ranked the eleventh place (3). Osareh & Wilson (2005) scrutinize on the range of sharing of Iranians at international level during 1995-1999 by indexing citation of sciences and have compared their findings with their own previous research findings. Their results showed an increase in the amount of the scientific products among Iranian researchers during a 15-year (1985-1999) period. The products had increased in the second 5-year period (from 1016 documents to 2045), and in the third 5-year (1994-1999) period, an increase of 8.2 times compared to the second half (1990-1994) was documented (from 2045 to 5543 documents) (4). In 2006, Iran ranked the 43<sup>rd</sup> (with 20901 articles) according to ISI (though for reference to citations with 59572 citations, Iran had ranked the 49<sup>th</sup> in the world). In 2006, Turkey with 79586 documents ranks on the 24<sup>th</sup> level, and Greece with 56903 documents ranks on the 27<sup>th</sup> level. The Islamic Republic of Iran in Asia follows Japan, China, Russia, India, South Korea, Taiwan, Israel, Turkey, and Singapore, and ranks the 10<sup>th</sup>, while among the Middle Eastern nations Iran ranks the 4<sup>th</sup> and follows Turkey, Israel, and Egypt. Unfortunately, Iran has no rank, internationally speaking, in fields such as economics and trade, and microbiology; and the most important citations in Iran are related to chemistry and engineering (5). Dehghan (2007), in an article assesses the

documents indexed in Isa and Lisa for Iran, Turkey, Saudi Arabia, and Egypt; the article determines the role of the Iran's library society, and Iran's scientific place among the above three countries. The results showed that during 34 years (1969-2003), only 134 documents had been indexed in the above websites. Therefore, the condition of scientific products in Iranian librarianship is not suitable. Comparing the four above nations, we realized that only Iran had had a rising and sustainable level for the generation of science. The ten-year period during 1993-2003 marks Iran's the highest pick of presence in the sites, with 45 documents. Turkey had a big positive jump till 1993, yet, it has been constant since then. Saudi Arabia, though with more documents produced, has had a considerable declining trend. During 1993-99, Saudi Arabia had had a growing pick when the number of documented abstracts had reached to 66 (6). In a study by Hamidi, Osareh & Asnafi (2008), it was shown that 53 countries had good roles in providing documents among which the USA, the UK, Germany, and the Netherlands had ranked the first 4 top nations. In other words, 53.81 % of the documents belonged to these nations (7). Mehrad and Gazany (2007) in an article titled "Muslim world scientific powers" reviewed scientific products in Islamic countries based on the ISI reports from 2003 to 2007, as well as in 22 fields of sciences. According to the research findings, Iran, Turkey and Egypt are powerful countries in the Muslim world because of their scientific production. Turkey is ahead of Iran for scientific production and citations, except in the field of Chemistry, and Interdisciplinary fields, but the growth rate of science in Iran is faster than Turkey. Followed by Iran; Egypt is located in third place (8).

Furthermore, Dearnly (2005) believes that of the necessities for entering the third Millennium is the attention that has to be paid to the information society. It is a society in which information is the most important element (9). However, Jill (2003) notes that information and its production will be looked at as the sixth and the most important element after human, machine, money, material, and time. Indeed, the strategies required for the continuation of life will fail if attention is not paid to the generation of knowledge and its role in the survival of nations.

The standard for national development is somehow related to the generation of knowledge, though it seems that cultural, historical, and geographical factors all can affect it (10). Loucas (1993) notes that the historical backgrounds of Iran, Turkey, and Greece with common cultural, and ethnical aspects reveal intellectual

innovations and masterpieces inherited from their ancient civilizations (11). Currently, all the three nations have had special attention toward the generation of knowledge. However, it seems that the importance of the issue has not been the same among the three nations when entering to the 21<sup>st</sup> century, with some even considerable differences.

At the turn of the century, compared to Turkey and Greece, Iran had a much lower status in the generation of science; however, in the year 2008 (after 7 years), Iran has ranked the second among the three nations. According to the findings, the total rate of scientific products in Turkey and Greece are more than Iran, but the growth rate of science in Iran is faster than others which Mehrad and Gazani(2007) have found too.

The political conditions have had roles to play on the issue as well. For example, one of the reasons Turkey mentions for its growth of the generation of science is that it is to join the European Union as a key factor. If Turkey joins the EU, they will have the potential to benefit from higher growth and investment. Furthermore, joining the EU will increase competitiveness. Domestic monopolies will face greater competition from EU rivals. This should help to reduce prices and increase efficiency. Another benefit of joining the European Union would be that successful firms can benefit from large scale economies of Europe. As they sell to a wider EU market, they can expand production and get lower costs (12); so, for gaining all benefits Turkey should try to decrease distances, especially in scientific products rate. This brings about a serious point when discussing the differences between Turkey and Greece, as Greece has always been a European nation. Iran, at the turn of the millennium, and especially with the idea of its President (at the time) who considered the new century as 'the century for the dialogs among civilizations', has tried to equip itself with knowledge and science at an extensive level. If Iran wants to cooperate with other countries in scientific or economical projects, scientific products should be increased by Iranian researchers, because "knowledge itself is power". The growth of science in Iran is itself a good evidence for this issue which needs to grow. Furthermore, the end-result of the globalization process can only be beneficial to everybody, in developed and developing countries alike; we will succeed only if we cease resisting and try instead to adapt to the new realities of globalization whose manifestation is production of science; so we need to adopt a more positive attitude and try to take advantage of the new realities by transforming our

economies, promoting our education and spending significantly more on scientific production. It is the only choice available.

## REFERENCES

1. Zolfigol MA, Kiyani Bakhtiari A. Knowledge-Based Structures at the Age of Cognition. *Rahyaft* 2006; 37:14-23.
2. Jokar A, Ebrahimi S. The Tendency of the Nations to Document the Science Generated by Iranians. *The quarterly journal of library and information science* 2004; 2(2): 33-54.
3. Sotoudeh h. An Investigation on Motivations on the Practical Function of Nations: An Outlook on the Middle East. *Informology* 2004; 2(2):33-54.
4. Osareh F, Wilson C.S. A Comparison of Iranian scientific publication in the Science Citation Index: 1985-1989 and 1990-1994. *Scientometrics* 2000; 48(3):427-442.
5. Salehi K, Nowrouzi AR. The Scientific Location of Iran in the World and the Impact Factor of the Iranian International Journals. *Informology* 2006; 3(3&4):169-180.
6. Dehqan Sh. The Generation of Scientific Librarian Information and Informatics in Iran, Turkey, Saudi Arabia, and Egypt. *The quarterly journal of library and information science* 2007; 10(1):179-196.
7. Hamidi, A, Osareh, F, Asnafi, AR. The Analysis & Depiction of the Structure of Scientific products in Bibliometrics, Scientometrics, Informetrics, and Webometrics in the Web of Science during 1990-2005. *The quarterly journal of library and information science*. 2008; 11(2):161-182
8. Mehrad J, Gazani A. Muslim world scientific powers. *Faslnameye Ketab* 2007; 71:125-140
9. Dearnly J, Feather J. *The Wired world*. [Persian version by Amin Dehqan N and Mahami M]. Tehran: Chapar Publications; 2005.
10. Jill NS, Dabas KC. Challenges before Information Society. *Informology* 2003; 1(2):179-192.
11. Loucas H. *The History of Civilization*. [Persian Version by Abdolhosein Azarang]. Tehran: Keyhan Publications; 1983.
12. Institute for political and international studies. Turkey. Tehran: foreign minister publication, 2007. [Persian]