



Innovative activities in Iran: A first glance



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ABSTRACT

This paper proposes a descriptive account of basic features of innovative activities in Iran during the period 2008–2012 measured by patents registered before the Iranian Patent Office. Our study shows a pronounced decline in the number of Iranian patents during the studied period. It also demonstrates an exceptionally large share of individuals as patent holders. Our results indicate that innovative activities are strongly concentrated around Tehran, the capital. Finally, we refer to evidence which implies that Iran's decreased patenting activity in recent years could be mostly due to other factors rather than the country's slowing pace of technological innovation.

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1. Introduction

Over the past several decades, we have witnessed a greatly increased interest in using patent statistics as a proxy for innovative activities at national, sectoral, technology, and firm levels [1,2]. Patents are known not to be perfect indicators of innovative activities and this imperfection becomes more apparent when domestic patents of developing countries are discussed [3]. However, there is almost no perfect substitute measure of technological innovation. In absence of patent statistics, many arguments are reduced to pure speculation or to the use of only distantly related measures and proxies. As Griliches put it: "In this desert of data, patent statistics loom up as a mirage of wonderful plentitude and objectivity. They are available; they are by definition related to inventiveness, and they are based on what appears to be an objective and only slowly changing standard. No wonder that the idea that something interesting might be learned from such data tends to be rediscovered in each generation." [4].

Despite the increasing interest in using patent statistics as an indicator of technological activity, there have been no attempts to undertake an in-depth investigation into patents registered in Iran. Accordingly, the nature and extent of patenting activities in Iran have long been something of a mystery. This is mostly due to the fact that until recently, the publicly available information on Iranian

patents was very limited. The Iranian Patent Office had no open-to-public database and did not publish special gazettes for Iranian patents. The only official statistics on Iranian patents were the yearly number of filed applications and granted patents, as provided by the national Patent Office.

A few attempts to analyze the patenting activity in Iran, due to the aforementioned limitations, have been focused only on Iranians patenting abroad - mostly in the US [5,6]. However, the number of Iranian patents in the US, due to many differences between Iran and the US in terms of the economic costs and benefits of patenting, is not a good proxy of innovative activities inside Iran.

This study explores, for the first time, the patenting activity in Iran. The descriptive statistics of patent data are mainly used to quantitatively describe the most notable features of patenting activity in Iran over the 2008–2012 period. It shows that, contrary to Iran's fast scientific progress, the number of patents registered in the country experienced a sharp decline over the studied period. We also demonstrate that an exceptionally large share of patents is owned by individual inventors.

Our study addresses the question of the geographic concentration of innovative activities at provincial level within the country. The results indicate that innovative activities are strongly concentrated around Tehran, the capital. Finally, we refer to evidence which implies that Iran's decreased patenting activity could be mostly due to other factors (e.g. patent system reform) rather than the country's slowing pace of technological innovation.

The remainder of this paper is structured as follows: Section 2 briefly introduces Iran's developments in science and technology; Section 3 surveys some prior attempts to characterize patenting

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activity of Iranians; Section 4 introduces the data; Section 5 summarizes the key results of the study and Section 6 concludes.

2. Stimulating scientific and technological endeavor in Iran

Over the last decade or so, Iran has responded to foreign imposed trade sanctions by increased investment in its own scientific and economic infrastructure. The expansion of higher education and increased expenditure on research and development are just two of the policy mechanisms that have fueled the country's more active approach toward science and technology [7]. The government R&D expenditure as a percentage of the Gross Domestic Product (GDP) increased from 0.49 in 2001 to 0.62 in 2009 [8].

The increased investment in education resulted in almost 26 percent growth in the adult literacy rate from 1990 to 2008. Moreover, the number of researchers per million inhabitants has risen from 500 in 2000 to 850 in 2007 [7]. The results, in terms of knowledge creation, have been impressive. As reported by Thomson Reuters' Science Citation Index (SCI) the number of Iranian articles published in the international journals rose from only 1296 in 2000 to 10894 by 2008 (see Fig. 1) [7]. Another report based on publication data from a 30-year period (1980–2009), indicates that Iran's scientific output has grown 11 times faster than the world average, faster than any other country [9]. Although these numbers are quantitative indicators, quality indicators too refer to a similar trend. The bimonthly newsletter of Thomson ScienceWatch.com, for instance, shows that Iran was among the countries that achieved the highest percentage increase in total citations in the period from December 2007 to February 2008 (UNESCO, 2010).

As the above numbers show, the imposed economic sanctions against Iran, with the primary aim of cutting off technology sale and transfer to the country, have initiated new efforts in the country to foster indigenous science and technology capabilities.

Considering the remarkable growth rate of Iran's international scientific output, one would expect a similar pattern to be true for patented inventions of the country. In our study, however, we found a different pattern. This paper offers summary information on the results and provides descriptive statistical analyses of the number of patents to quantitatively describe the most notable features of patenting activity in Iran over the 2008 to 2012 period.

3. Previous studies: not really representative

As mentioned earlier, the Iranian Patent Office had no open-to-public database and did not publish special gazettes for Iranian patents. The office has never provided official details beyond the annual numbers of filed applications and granted patents. In July 2012 the Iranian Patent Office launched a trial version of an online

searchable patent database. This online database, however, still suffers from many deficiencies [10]. Therefore it is not suitable for a thorough/systematic patent analysis.

Considering the difficulties in accessing the country's patent data, it has been a very difficult task for researchers to conduct any detailed study on patenting activities and trends in Iran. In recent years, a few attempts have touched upon the patenting activities of Iranians. However, due to the aforementioned difficulties, the focus of these studies has been on Iranians patenting abroad - mostly in the US. For instance, Noruzi and Abdekhoda explored the patenting activity of Iranians by looking into the United States Patent and Trademark Office (USPTO), World Intellectual Property Organization (WIPO), and European Patent Office (EPO) patent databases [5]. They limited their search to patents with at least one Iranian inventor filed in those offices over the period 1976–2011. They showed an increasing trend in the number of filed patent applications by Iranians over the time period. Moreover, they noted that the highest number of patents studied (27%) were related to “chemistry/metallurgy” technology area. However, since their research does not include patents registered in Iran and due to the very low number of the observations (only 212 patents), the results cannot adequately portray the patenting activity of the country.

Sarkissian investigated the patents granted to Iranians by the USPTO [6]. The search yielded 72 patents granted to Iranian inventors in the US over the period 2002–2012. The results of this study also revealed a surge in the number of Iranian patents registered in the US and that the capital city Tehran is the most cited inventor city in Iran. Again, due to the very low number of patents studied in his research, the results do not paint a representative picture of the innovative activities in Iran.

As Pavitt indicated there are many differences amongst countries when it comes to the economic costs and benefits of patenting [1]. This is in part due to the differences in costs, time and standards of the patent examination and enforcement, together with the expected market size. Accordingly, exploring domestic patents of developing countries provides a much broader picture than USPTO patents [3]. Even if the number of Iranian patents in the US has been statistically sufficient, which is not the case, it could not be referred to as a good proxy of innovative activities inside Iran.

The data introduced in this paper can open a new path to further study on innovative behavior of Iran as a developing country which has been under economic sanction.

4. Sources and data

The only reliable way to get access to the country's patent data used to be and still is the “Iranian Official Journal,” since the Patent Office asks each applicant to publish an advertisement in the Official Journal before issuing the grant certificate. The Official

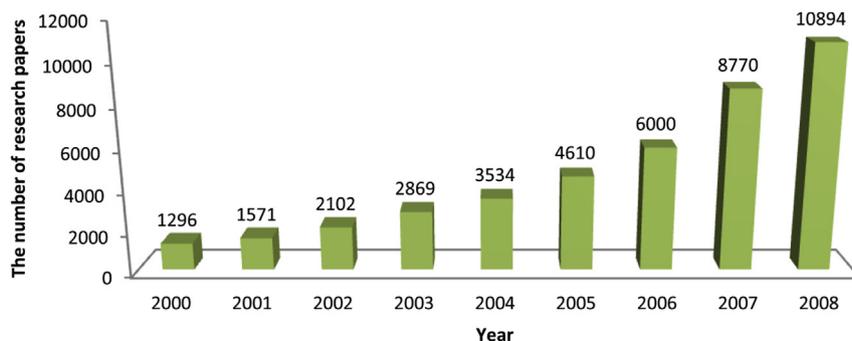


Fig. 1. Iran's scientific publications, 2000–2008 (UNESCO, 2010).

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