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# International visibility of Iranian ISI journals

## A citation study

Visibility of  
Iranian ISI  
journals

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### Abstract

**Purpose** – This research paper aims to investigate the internationalization and visibility of Iranian scientific journals covered by the Institute for Scientific Information (ISI) between 2000 and 2006.

**Design/methodology/approach** – A total of 1,298 articles published in seven Iranian ISI journals and a random sample of 1,298 articles written by Iranians and published in non-Iranian ISI journals between 2000 and 2006 were selected. Impact factor (IF), total citation (TC), citation rates, self-citation, foreign citation, international citation (IC), international authorship, and subject distribution were analyzed for the collections.

**Findings** – Results indicated that: the visibility rate of Iranian journals is low compared to their international counterparts; the international visibility of Iranian journals differs among disciplines; the increasing citation rate is less than the increase in publication rate; and the majority of authors who published in these journals were Iranian.

**Originality/value** – Mere inclusion of scientific journals in the ISI does not necessarily lead to an increase in international visibility. The study highlights the need for more studies on the techniques to increase the visibility of scientific journals of the developing countries.

**Keywords** Sciences, Serials, Generation and dissemination of information, Iran

**Paper type** Research paper

### Introduction

Scientific journals are the major medium of exchange and dissemination of scientific information. The number of publications presenting the results of scientific research is enormous and may increase even more with new developments in the electronic media (Marusic and Marusic, 1999). From 1999, the Iran Science, Research and Technology Ministry encouraged researchers to publish their English language articles in international scientific journals. Accordingly Iran's productivity in science and technology has increased dramatically during recent years. Iran doubled its output in the first two five year plan (from 1,016 to 2,045 publications), and increased 75 per cent from the second to the third five year period (from 2,045 to 5,549 publications) (Osareh and Wilson, 2002). In recent years, there has also been an increasing focus on the internationalization of academic journals in Iran. Journal internationality refers to the extent of a journal being international or global in scope or repute. It is considered to include features such as use of the English language, international peer reviewers, orientation to an international readership, international editorial board, and submissions by foreign authors (Wang *et al.*, 2007). In this paper, by international journals we mean those included in international academic reference databases indexed by the Institute for Scientific Information (ISI).



Two different approaches are used in order to assess and compare journals. The first approach is "peer review" assessment that is based on the opinion of experts. The second approach is citation analysis. In this study we follow the second approach. Most of the research results are published in scientific journals and they are linked together by mutual citations. The citing article provides an entrance to the results from cited articles to prove and support some of its own conclusions. Citations reflect a natural international language of science and scholarship. Therefore, the analysis of scientific citations can be used as one of the criteria to measure the quality of a journal (He, 2003). A current standard measure of visibility in the scientific world is the average number of citations that an article receives in subsequent publications in the same or other journals (Garfield, 1990).

### **Aims and objectives**

This paper investigates the extent of the visibility in Iranian international journals through the Institute for Scientific Information (ISI) databases for the years 2000-2006. More specifically, the study measures the international nature of Iranian scientific journals based on the distribution of authoring, co-authorship and citing countries.

### **Research questions**

The study attempts to answer the following research questions:

- RQ1.* What is the citation/visibility rate among Iranian international journal articles and how does this compare to Iranian articles published in non-Iranian international journals indexed in ISI?
- RQ2.* Does the citation rate of the articles published in Iranian international journals differ significantly among individual disciplines?
- RQ3.* Is there a relationship between the growth number of articles and citation rate of articles published in Iranian international journals?
- RQ4.* What is the international authorship and co-authorship pattern of the articles in the journals?

### **Literature review**

Research on the international flow of information, including scientific information, has flourished since 1970 (Mawlana, 1986). Zitt and Bassecoulers (1998) discussed the internationalization of scientific journals based on the distribution of authoring and citing countries. In this study, experimental internationalization indexes were calculated on the SCI for journals belonging to Earth and Space and Applied Biology. They found that the results for relative international authoring were very similar to those for international citing. The main conclusion was the convergence of measurements based on publication and citation distribution.

In recent years, many studies have been conducted on journal visibility and internationalization especially in China. Okubo (1999) compared the international paper proportion of five Chinese scientific journals in 1996 with that of well-known foreign journals in the same category, and argued that journals with a high impact factor always have internationalization. Ren and Rousseau (2002) took physics and chemistry journals as samples and did not distinguish between Chinese and English

language journals. Ren and Rousseau also analyzed journal citation report (JCR) data from 2000 and 2001. They found that Chinese English language journals are not internationally recognized and have very low international visibility. Wang *et al.* (2007) analyzed the internationalization of ten of China's English language scientific journals. The data showed that though the total trend of Impact Factor and Total Citation keeps rising, their subject rank has shown a slight decrease.

Pouris (2005) assessed the impact and visibility of South African journals. The findings indicated that the termination of government interference in the affairs of the journals had on average a beneficial effect on the impact factor of the journals. South Africa was found to have a good representation in the JCR, accounting for approximately 90 per cent of the African continent journals. Wormell (1998) found that the core international LIS journals are not as international as one might expect, and the reporting of scientific production in the field still largely follows Anglo-American traditions. Tompkins *et al.* (2001) reviewed internationalization of general surgical journals. The study found that true internationalization of the highly rated British and the five highest rated US general surgical journals had occurred. Sin (2005) analyzed the internationality of 20 international library and information science (LIS) journals. Findings suggest an increase in the internationality of LIS authorships over the years.

Some studies have used ISI databases to study the scientific publication of Iran *vis-à-vis* the rest of the world. Osareh and Wilson (2000) compared Iranian scientists' communication patterns during 1985-1989 and 1990-1994 to address changes in their publications in two periods. Analyses include:

- productivity by publication year and by ranking order of the most productive Iranian authors;
- impact of the most productive Iranian authors by ranking them as cited authors;
- collaboration of Iranian scientists with scientists from other countries; and
- the journals Iranian scientists published in and which they cite in their papers.

Mehrdad *et al.* (2004) conducted a study on basic science publication in Iran. The study revealed that the average impact factor of the papers in various fields of basic science appears satisfactory. Moin *et al.* (2005) reviewed the scientific output of Iran over the period 1967-2003 and compared it with 15 countries in the year 2000. During these years Iran's relative share in global scientific output increased from 0.0003 per cent to 0.29 per cent in 2003. Comparing the ratio of science output to gross national product, Iran stood at the 13th place among 16 countries in the year 2000. Harirchi *et al.* (2007) investigated factors behind co-authorship between scientists in Iran and elsewhere and also compared the Iranian pattern of collaboration with other countries. The results showed that not all co-authored articles were the result of a collaborative project. Sharing laboratory devices, accessing knowledge and increased efficiency of the study were the main collaborative motives behind the co-authorships. Although the proportion of international co-authorship is lower than in most other countries, the collaborative pattern seems rather similar. Mozaffarian and Jamali (2008) studied the gender distribution of articles published by Iranian authors in ISI journals in 2003. The results revealed that the productivity of female authors at the individual level as measured by article per author share was lower than male authors. In total, females accounted for 6 per cent and males for 94 per cent of the articles published in 2003. The

reviewed studies have shown that Iran steadily increased its international profile in science and technology through research publications in journals indexed by the ISI.

### Methodology

The internationalized nature of scientific journals may be determined by many methods such as: the national distribution of authors, the national distribution of users (readers, subscribers and citers), the co-authorship linkage, publishing choices, and the national structure of editorial boards (Zitt and Bassecouard, 1998). In this study we will focus on the first three dimensions. Using the citation analysis method, this paper provides an analysis of the visibility of Iranian scientific journals based on variables such as their impact factor (IF), total citation (TC), citation rates, self-citation, foreign citation, international citation (IC), international authorship, and discipline distribution. In order to examine the current internationality of Iranian journals, the journals were selected if they were indexed in ISI databases or exactly in Journal Citation Report (JCR). To obtain data from Iranian international journals we used Science Citation Index (SCI) and JCR for the period 2000-2006 through Web of Science (<http://apps.newisiknowledge.com>). The data were collected during December 2007 to February 2008 using the following procedure. First, we searched the JCR; only seven Iranian journals were identified. These journals were:

- *Iranian Polymer Journal*;
- *Journal of the Iranian Chemical Society*;
- *Iranian Journal of Chemistry and Chemical Engineering – International English Edition*;
- *Iranian Journal of Science and Technology*;
- *Iranian Journal of Science and Technology Transaction B – Engineering*;
- *Iranian Journal of Public Health*; and
- *Iranian Journal of Science and Technology Transaction A – Science*.

During the period (2000-2006) 1,298 articles were published in these journals. Second, we searched the total citations for 2000-2006 of all the papers of the journals. Then we browsed every cited article based on the above-mentioned variables. In order to evaluate objectivity the international status of Iranian scientific journals, a list of articles published by Iranian authors in non-Iranian scientific journals indexed by ISI databases for 2000-2006 was obtained. From the list 1,298 articles were randomly chosen and their citation data were also extracted and compared. To place the investigation and the methodology used in a scientific framework a statistical analysis was carried out on the real figures to test how strong the correlations are between some variables, as well as to see how significant are the differences in their distribution patterns.

### Findings

A journal's visibility depends on the articles that it publishes. We used citations as a partial indicator of scientific visibility. In order to evaluate a journal's international status, a comparison with other journals in the same subject category is also important. For this the citation rates of a sample of 1,298 articles published in non-Iranian and Iranian international journals included in ISI databases were calculated. The data (Table I) indicate that the total citation rates for Iranian articles published in

| Journals                           | Number of articles | Cited items | Non-cited items | Citation rate |                  |                | Citation proportion per article |                  |                |
|------------------------------------|--------------------|-------------|-----------------|---------------|------------------|----------------|---------------------------------|------------------|----------------|
|                                    |                    |             |                 | Self-citation | Foreign citation | Total citation | Self-citation                   | Foreign citation | Total citation |
| Iranian international journals     | 1,298              | 424         | 874             | 586           | 372              | 958            | 0.45                            | 0.29             | 0.74           |
| Percentages                        | 100                | 32.6        | 67.33           | 61.17         | 38.83            | 100            |                                 |                  |                |
| Non-Iranian international journals | 1,298              | 771         | 527             | 1,772         | 2,389            | 4,161          | 1.36                            | 1.84             | 3.21           |
| Percentages                        | 100                | 59.40       | 40.60           | 42.59         | 57.41            | 100            |                                 |                  |                |

**Table I.**  
The visibility of the articles published in Iranian and non-Iranian international journals during 2000-2006

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non-Iranian journals covered by ISI were 3.21 and for Iranian journals were 0.74 per article during the period 2000-2006. The  $t$  test was run to analyze the significance of the difference in the two citation rates. The test result ( $t = 13.06, p = 0.000$ ) demonstrated that the visibility or citation rates of the articles published in non-Iranian international journals was significantly higher than Iranian international journals.

Table I also shows the cited and non-cited items published in Iranian and non-Iranian international journals. The average cited items (including self-citation) over the total of articles was 32.67 per cent for Iranian journals and 59.40 per cent for non-Iranian journals. The non-cited items were 67.33 per cent and 40.60 per cent for Iranian and non-Iranian journals respectively. It means that in comparison with Iranian articles in non-Iranian journals, most articles published in Iranian journals have not been recognized. In Iranian journals 61.17 per cent of the citations were self-citations, but it is 42.59 per cent in non-Iranian journals. The self-citation interest among Iranian authors and international authors that have published articles in Iranian international journals were also calculated. The figures in Table II show that author self-citation rates were 61.70 per cent among Iranian authors and 58.40 per cent among international authors. The table also reveals that the foreign citation rate of articles published by international authors in Iranian journals is higher than those articles published by Iranian authors.

Table III demonstrates the citation distribution of the articles in Iranian international journals. Based on the data, the *Journal of the Iranian Chemical Society* and *Iranian Polymer Journal* are the most visible. By using the data in Table III, the Pearson correlation coefficient test result revealed high and positive correlation between self-citation rates and total citation (TC) ( $p = 0.026$ ). It means that (with 95 per cent level of confidence) the TC will increase by raising of self-citation rates. It is easy to infer that the self-citation rate has a positive effect on the rise of impact factor (IF) and TC. Such self-citation may reflect the poor international visibility of the journals.

Citations from all nationalities are also an important aspect in improving the globalization level (Ren and Rousseau, 2002) and this is another way to analyze the visibility of a set of journals. Out of a total number of 958 citations (Table I) to the articles published in the Iranian journals, 215 (22.44 per cent) (Table IV) were received from non-Iranian authors citing the articles in our investigation. As can be seen in Table IV the majority of citations came from China (15.81 per cent) followed by India (11.63 per cent). More than 39 per cent of citations came from European countries, 38.60 per cent from Asian countries and 22.32 per cent from other countries.

The distribution per discipline of articles published in Iranian scientific journals in the ISI for the years 2000-2006 is listed in Table V. The published articles are in 26 subject areas: in science, engineering, medicine and agriculture. Table V shows that there are more chemistry articles (chemistry and engineering chemistry = 61.9 per cent) covered by the journals than other fields. What should be noted here with regard to the high rate of published articles in chemistry is that three of the studied journals are chemistry journals and obviously publish chemistry related articles. The Table indicates that chemistry is also the field in which Iran has the highest number of citations in the ISI. Based on the data in Table V, out of 26 subject areas 13 (50 per cent) areas have not received any citation. The Analysis of Variance (ANOVA) test showed that there is significant differences among the visibility of the disciplines ( $p = 0.000$ ).

Table VI shows the distribution of articles and citations during the period. The Table indicates that the number of articles in Iranian international journals greatly increased from 2000 to 2006. The increase ratio for articles covered by the journals is 4 per cent. It can be seen from Table VI that except for the year 2005, which had a relatively high citation rate, in the other years the citation rate had a steady slow increase. Correlation tests were used to determine if the number of citations was related to the number of articles. The Pearson correlation coefficient test with 95 per cent confidence level generally showed a weak or no correlation between article and citation data in the period of the investigation ( $p = 0.136$ ). It means that the citation rate cannot be explained through the distribution of articles.

The percentage of international authorship and co-authorship in a journal provides an indication of the level of a journal's international standing (Okubo, 1999). Counting of origin of articles published in the seven journals showed that out of 1,298 articles published in the journals, 967 articles (74.5 per cent) contained just Iranian authors (self authoring) and about 116 articles (8.94 per cent) were the result of collaboration of Iranian and non-Iranian authors. Collaborations are measured using information derived from the institutional addresses listed on co-authored publications. There were only 215 articles (16.56 per cent) that were published by international authors alone (Table VII). International collaborations of Iranian authors in ISI journals were also investigated by Mozaffarian and Jamali (2008). They found that 17.63 per cent of Iranian articles published in 2003 involved international collaboration, while this figure is 8.94 per cent in our study. The data reveals that the patterns of international collaboration among Iranian scholars may be different in Iranian and non Iranian ISI journals.

However, the number of international articles increased from 12 titles in 2000 to 58 titles in 2006. The total articles published in the studied journals were written by 3,566 authors, from that 2,749 authors (77.08 per cent) are Iranian and 817 authors (22.9 per cent) are non-Iranian. These results revealed that the pool of authors in Iranian journals is relatively limited to Iranian authors and international authors rarely submit their manuscripts to Iranian journals. Further analysis revealed that authors from India (22 per cent), China (17 per cent), Turkey (8 per cent) and Pakistan (6 per cent) had the highest contribution in publishing articles in Iranian journals. Analysis also showed that 57.23 per cent of the non-Iranian contributors are from Asia, 26.9 per cent from Europe, 9.17 per cent from Africa, 1.39 per cent from America, and 0.15 per cent from Australia (Table VIII).

It can be concluded that Asian authors have more tendency to publish articles in Iranian journals. A study on three Iranian international journals (*Iranian Journal of Science and Technology*, *Iranian Journal of Chemistry and Chemical Engineering International English Edition* and *Iranian Polymer Journal*) indexed in SCI during the 1995 to 1999 period revealed that in these three Iranian journals 256 papers with at

| Articles written by Iranian authors |      |                  |      |       | Articles written by international authors |      |                  |      |       | Total                 |                          |
|-------------------------------------|------|------------------|------|-------|---|------|------------------|------|-------|-----------------------|--------------------------|
| Self-citation (%)                   | %    | Foreign citation | %    | Total | Self-citation                             | %    | Foreign citation | %    | Total | Self-citation (61.17) | Foreign citation (38.83) |
| 489                                 | 61.7 | 303              | 38.3 | 792   | 97  | 58.4 | 69               | 41.6 | 166   | 586                   | 372                      |

**Table II.**  
Self-citation and non-self-citation rates among Iranian and international authors



**Table III.**  
Citation distribution of  
the articles in Iranian  
international journals  
during 2000-2006

| Journal titles   | Total number of<br>articles | Cited<br>items | Non-cited<br>items | Self-citation | Foreign<br>citation | Total<br>citation | Citation rate<br>per article |
|--|-----------------------------|----------------|--------------------|---------------|---------------------|-------------------|------------------------------|
| <i>Iranian Polymer Journal</i>   | 446                         | 209<br>(46.8)  | 237<br>(53.2)      | 337<br>(62.7) | 200<br>(37.2)       | 537               | 1.20                         |
| <i>Iranian Journal of Science and Technology</i>   | 350                         | 68<br>(19.4)   | 282<br>(80.6)      | 72<br>(73.5)  | 26<br>(26.5)        | 98                | 0.28                         |
| <i>Iranian Journal of Chemistry and Chemical Engineering –<br/>International English Edition</i> | 174                         | 63<br>(36.2)   | 111<br>(63.8)      | 96<br>(63.6)  | 55<br>(36.4)        | 151               | 0.87                         |
| <i>Journal of The Iranian Chemical Society</i>   | 111                         | 64<br>(57.6)   | 47<br>(42.4)       | 107<br>(52.1) | 98<br>(47.8)        | 205               | 1.85                         |
| <i>Iranian Journal of Science and Technology Transaction<br/>A-Science</i>                       | 63                          | 3<br>(4.7)     | 60<br>(95.3)       | 1<br>(33.3)   | 2<br>(60.6)         | 3                 | 0.05                         |
| <i>Iranian Journal of Science and Technology Transaction<br/>B-Engineering</i>                   | 97                          | 12<br>(12.3)   | 85<br>(87.7)       | 11<br>(68.7)  | 5<br>(31.2)         | 16                | 0.16                         |
| <i>Iranian Journal of Public Health</i>  | 57                          | 5<br>(8.7)     | 52<br>(91.3)       | 3<br>(50.00)  | 3<br>(50.00)        | 6                 | 0.10                         |

**Note:** Figures in parentheses and percentages

| No. | Countries   | Number of citations | No. | Countries    | Number of citations |
|-----|-------------|---------------------|-----|--------------|---------------------|
| 1   | China       | 34(15.81)           | 21  | Australia    | 2(0.93)             |
| 2   | India       | 25(11.63)           | 22  | Portuguese   | 2(0.93)             |
| 3   | America     | 17(7.90)            | 23  | Czech        | 2(0.93)             |
| 4   | Turkey      | 15(6.97)            | 24  | Japan        | 2(0.93)             |
| 5   | Germany     | 12(5.58)            | 25  | Switzerland  | 2(0.93)             |
| 6   | Netherlands | 11(5.11)            | 26  | Mexico       | 2(0.93)             |
| 7   | England     | 8(3.72)             | 27  | Norway       | 2(0.93)             |
| 8   | Romania     | 8(3.72)             | 28  | Greece       | 2(0.93)             |
| 9   | Spain       | 7(3.26)             | 29  | South Africa | 1(0.47)             |
| 10  | Brazil      | 7(3.26)             | 30  | Austria      | 1(0.47)             |
| 11  | France      | 7(3.26)             | 31  | Israel       | 1(0.47)             |
| 12  | Canada      | 6(2.79)             | 32  | Scotland     | 1(0.47)             |
| 13  | Poland      | 5(2.33)             | 33  | Ukraine      | 1(0.47)             |
| 14  | Algeria     | 4(1.86)             | 34  | Belgium      | 1(0.47)             |
| 15  | Ireland     | 4(1.86)             | 35  | Taiwan       | 1(0.47)             |
| 16  | Thailand    | 4(1.86)             | 36  | Sweden       | 1(0.47)             |
| 17  | Egypt       | 4(1.86)             | 37  | Chili        | 1(0.47)             |
| 18  | Italy       | 3(1.39)             | 38  | Finland      | 1(0.47)             |
| 19  | Russia      | 3(1.39)             | 39  | Malaysia     | 1(0.47)             |
| 20  | Moldavia    | 3(1.39)             | 40  | Nigeria      | 1(0.47)             |

**Note:** Total number of citations =215

**Table IV.**  
Distribution of  
international citation to  
the articles in Iranian  
international journals

least one Iranian author in each had been published during 1995 to 1999. The remaining 61 papers in these three Iranian journals for the same period were papers by Indian and US scientists. The USA, UK and Australia were the major country collaborators of Iranian scientists for the 256 papers in the three Iranian journals from 1995 to 1999 (Osareh and Wilson, 2002). Looking ahead, papers in the Iranian journals for 2000 to 2006 indicate India, China, Turkey and Pakistan as Iran's top country collaborators. A preliminary conclusion may be that the co-country collaboration pattern has changed during the past years. The calculated values provide useful indications about the size of differences in these distribution patterns, which call for attention and enlighten the special situation.

The data analyzed included the journal's impact factor (IF) from the Journal Citation Report (JCR) of the ISI. Just three journal's IF were available. Figures revealed that all journal's IF were equal or less than 0.37 and IF values rose slowly. *Iranian Polymer Journal* had the highest IF (IF = 0.37) in 2001, and was the top ranked journal in terms of total citations. Figures also shows that, since 2000, the ranking of these journals has not greatly changed, shows a slight decrease and basically keeps the lower rank. This indicated that papers in these journals were rarely cited. This is not a satisfactory share considering that more than 40 per cent of the journals in the JCR have an impact factor above one (Glanzel and Moed, 2002).

### Conclusion and discussion

The results demonstrate that the total citation/visibility rate for Iranian international journals (0.74) is significantly lower than non-Iranian international journals (3.21). A webometric analysis on the visibility of Iranian journal web sites showed that about 93

| Subject fields                  | Frequency | Std deviation | Std error | Minimum citation time | Maximum citation time | Mean of citation |
|---------------------------------|-----------|---------------|-----------|-----------------------|-----------------------|------------------|
| Chemistry                       | 239       | 1.861         | 0.12      | 0                     | 24                    | 0.62             |
| Aerospace                       | 7         | 0.787         | 0.297     | 0                     | 2                     | 0.43             |
| Chemistry engineering           | 565       | 0.903         | 0.038     | 0                     | 7                     | 0.37             |
| Irrigation                      | 17        | 0.588         | 0.143     | 0                     | 2                     | 0.29             |
| Medical sciences                | 4         | 0.5           | 0.25      | 0                     | 1                     | 0.25             |
| Mine engineering                | 7         | 0.378         | 0.143     | 0                     | 1                     | 0.14             |
| Industry engineering            | 8         | 0.354         | 0.125     | 0                     | 1                     | 0.13             |
| Civil engineering               | 70        | 0.32          | 0.038     | 0                     | 1                     | 0.11             |
| Mathematics                     | 33        | 0.348         | 0.061     | 0                     | 2                     | 0.06             |
| Health                          | 57        | 0.225         | 0.03      | 0                     | 1                     | 0.05             |
| Electronic engineering          | 81        | 0.247         | 0.027     | 0                     | 2                     | 0.04             |
| Biology                         | 33        | 0.174         | 0.03      | 0                     | 1                     | 0.03             |
| Pharmacology                    | 1         | -             | -         | 1                     | 1                     | 1                |
| Mechanical engineering          | 67        | 0             | 0         | 0                     | 0                     | 0                |
| Computer engineering            | 21        | 0             | 0         | 0                     | 0                     | 0                |
| Physics                         | 28        | 0             | 0         | 0                     | 0                     | 0                |
| Aerology                        | 3         | 0             | 0         | 0                     | 0                     | 0                |
| Agriculture                     | 7         | 0             | 0         | 0                     | 0                     | 0                |
| Geology                         | 10        | 0             | 0         | 0                     | 0                     | 0                |
| Zoology                         | 4         | 0             | 0         | 0                     | 0                     | 0                |
| Biochemistry                    | 11        | 0             | 0         | 0                     | 0                     | 0                |
| Material engineering            | 18        | 0             | 0         | 0                     | 0                     | 0                |
| Oceanology                      | 1         | -             | -         | 0                     | 0                     | 0                |
| Biomedical                      | 2         | 0             | 0         | 0                     | 0                     | 0                |
| Environment and natural sources | 2         | 0             | 0         | 0                     | 0                     | 0                |
| Railway engineering             | 1         | -             | -         | 0                     | 0                     | 0                |
| Anonymous                       | 1         | -             | -         | 0                     | 0                     | 0                |
| Total                           | 1298      | 1.03          | 0.029     | 0                     | 24                    | 0.3              |

**Table V.**  
Discipline distribution and citation rate

| Years | Number of articles | Citation times | Citation rate | Std deviation | Std error | Minimum | Maximum |
|-------|--------------------|----------------|---------------|---------------|-----------|---------|---------|
| 2000  | 91                 | 36             | 0.4           | 0.93          | 0.097     | 0       | 5       |
| 2001  | 126                | 35             | 0.28          | 0.776         | 0.069     | 0       | 5       |
| 2002  | 123                | 43             | 0.35          | 1.056         | 0.095     | 0       | 7       |
| 2003  | 153                | 58             | 0.38          | 0.925         | 0.075     | 0       | 6       |
| 2004  | 211                | 51             | 0.24          | 0.732         | 0.05      | 0       | 6       |
| 2005  | 282                | 115            | 0.4           | 1.601         | 0.095     | 0       | 24      |
| 2006  | 312                | 51             | 0.16          | 0.602         | 0.034     | 0       | 6       |
| Total | 1298               | 389            | 0.3           | 1.03          | 0.029     | 0       | 24      |

**Table VI.**  
The number of articles and citation rates during 2000-2006

| Iranian authors | %    | International authors | %     | Collaboration | %    |
|-----------------|------|-----------------------|-------|---------------|------|
| 967             | 74.5 | 215                   | 16.56 | 116           | 8.94 |

**Table VII.**  
Authorship distribution in Iranian international journals by number of articles

per cent of links to the journal websites came from the journal's own country. In other words, the Iranian journal websites are not internationally visible (Zahedi, 2008), which confirms the result of this study.

The average IF of the journal is 0.24. The contribution of self-citation to the major contribution of the impact factors comes from self-citation of the authors, and also indicates that the effect of the journals was low. Kovacic and Misak (2004) argued that self-citation does not really reflect the visibility and quality of their work. The decrease in the proportion of journal self-citations probably reflects the journal's increased visibility. Although a high proportion of journal self-citations may indeed increase the impact factor of a journal, in a small journal this increase is illusory: it does not reflect an increase in international visibility, since the flow of information is limited mostly to the pool of the journal's authors and readers.

An analysis of the citations of 1,298 articles of the journals indicates that citation to these articles comes mainly from Iranian authors. The international visibility of Iranian journals differs among disciplines. The data indicate that the most visible scientific discipline is chemistry, which plays a leading role in Iranian basic research. Indeed, this is the field in which Iran is strongest, and for quite some time. Osareh and Wilson (2002) in their study found that the basic sciences (including chemistry) have remained stable throughout the fifteen-year period and account for nearly 40 per cent of Iranian scientific publications.

Our analysis indicated that there is no correlation between the size growth and citation rate in the studied journals. Analysis of the data indicates that the annual Iranian international journal publication output is 4 per cent of the total output during 2000-2006, but the citation growth hovered around 3 per cent during the period of study. The proportion of papers and international citation do not match. The increasing citation rate is less than the increase in size. Therefore, it can be concluded that there is no "Matthew effect" in article visibility of Iranian journals and it does not follow the world scientific system pattern as Katz stated. Katz (2000) in his study found that there is a strong Matthew effect in scientific recognition visibility. Katz said, a scientific community experiences a non-linear increase in the amount of recognition it receives as its size increases. For example, in the case of the UK scholarly science system each time the size doubles, on average the amount of recognition increases by 2.41 0.05 times; in the US system, it increases by 2.53 0.07 times. Katz believes size does matter; it affects recognition.

The geographical distribution of authors revealed that the majority of authors who published in Iranian international journals were Iranian. Articles by Asian authors showed the most striking increase in all journals.

At this stage, the following major conclusions can be drawn from the study:

- The degree of internationality of Iranian journals in international citation, international authorship, and international co-authorship is 16 per cent, 16.5 per cent and 8.94 per cent respectively.

| Countries      | Asia  | Europe | Africa | America | Australia | Anonymous | Total |
|----------------|-------|--------|--------|---------|-----------|-----------|-------|
| No. of authors | 368   | 173    | 59     | 9       | 1         | 33        | 643   |
| Percentage     | 57.23 | 26.9   | 9.17   | 1.39    | 0.15      | 5.13      | 100   |

**Table VIII.**  
Distribution of  
international authorship

- A degree of relationship is expected between the authoring, citing profiles, subject areas of the journals and self-citation pattern.

The authors concluded that Iranian international journals have not yet attained a high level of international recognition. Many factors may affect a journal's visibility. The reason for the low influence of Iranian international journals may be the lack of a high quality manuscript pool – Iranian scientists tend to publish their more important articles in non-Iranian international journals, the low international subscription rates of Iranian journals, and local journal title (name of Iran in title). Based on our analysis we may conclude that, as Zhou and Leydesdorff (2007) concluded, mere inclusion in the ISI does not necessarily lead to an increase in visibility. More needs to be done to increase this visibility, especially in terms of efforts from both scientific authors and editorial boards. Theoretically, if a journal has a larger cohort of international source authors and editors, then it is more likely to attract more citations and perhaps be more influential (Yue and Wilson, 2004). Thus, it is proposed that journal internationality could affect journal citation impact. To change the current conditions of Iranian scientific journals to raise their influence, the quality and visibility of articles needs to be improved. Efforts need to be made to increase their international effect by attracting international researchers to publish in Iranian journals, by encouraging the collaboration of Iranian and non-Iranian researchers, and to publish their results in Iranian journals.

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