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EDITORIAL

■ Who Ranks the Rankers?

University ranking based on teaching, research and services is not at all a new issue. Europe's biggest weekly magazine "Der Spiegel" published ranking lists of German universities as early as in 1993, and devoted a special issue on university ranking in the same year. However, this issue became a global one when the so-called *Shanghai Ranking* was published by the Institute of Higher Education, Shanghai Jiao Tong University in 2003 (new editions in 2004 and 2005). Other rankings have followed this example, for instance, *The Times Higher Education Supplement (THES)* or the Web based university ranking as an initiative of CINDOC in Madrid (Spain). The appearance of such rankings immediately resulted in controversial discussions (e.g., *van Raan*, 2005). Insufficient reflection of complexity, lacking robustness, methodological flaws and irreproducibility of ranking (e.g., *Florian*, 2007) were only some of points of criticism. The existence of competitive lists with their often contradicting results has caused confusion and concerns. Nevertheless, ranking of higher education institutes (HEI) has become reality we have to deal with. At their second meeting held in Berlin in 2006, the International Ranking Expert Group (IREG) has consequently elaborated a bundle of criteria which rankings should meet. The so-called *Berlin Principles of Higher Education Institutions* formulated and

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compiled at this convent are assumed to guarantee quality and good practice in university ranking as well as to increase credibility of ranking.

Recently, the 2nd *International Symposium on Ranking* [http://www.leiden.edu/rankings/] was held in Leiden on 2 and 3 February 2007. The main objective of the meeting was to answer the question of how universities should respond to ranking. Important facts about present ranking systems, past and future of HEI ranking can be found on the conference website.

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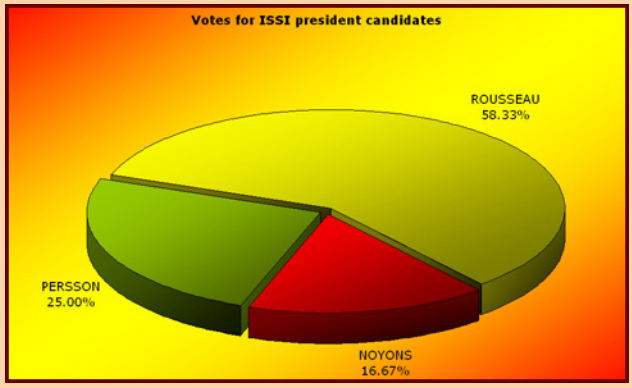
Wolfgang Glänzel

RESULTS OF THE PRESIDENTIAL ELECTION AND SOME COMMENTS ON ISSI

The results of our election for president have been concluded, and I am very pleased to inform the ISSI community that our next president will be Ronald Rousseau. Ronald certainly needs no introduction to our group, and I cannot think of a more experienced and capable individual to assume this role. He brings both technical accomplishments and honors (the Derek Price medal, etc.), and also organizational experience. He, along with Leo Egghe, co-organized the very first conference in 1987 of what was later to become our biennial ISSI meeting. Together they edited the first two conference proceedings. Ronald has attended every one of the conferences back to 1987, possibly a record, and was the conference chair for the Beijing meeting in 2003, which was more exciting than usual due to the SARS scare. He is a long standing member of the ISSI board, and we have benefited from his sound judgment and sly sense of humor. He also informs me that he is not a full-time informetrician but rather a mathematics teacher at an engineering school situated near the sea, which he can look out at through his office window as he waits for informetric inspiration.

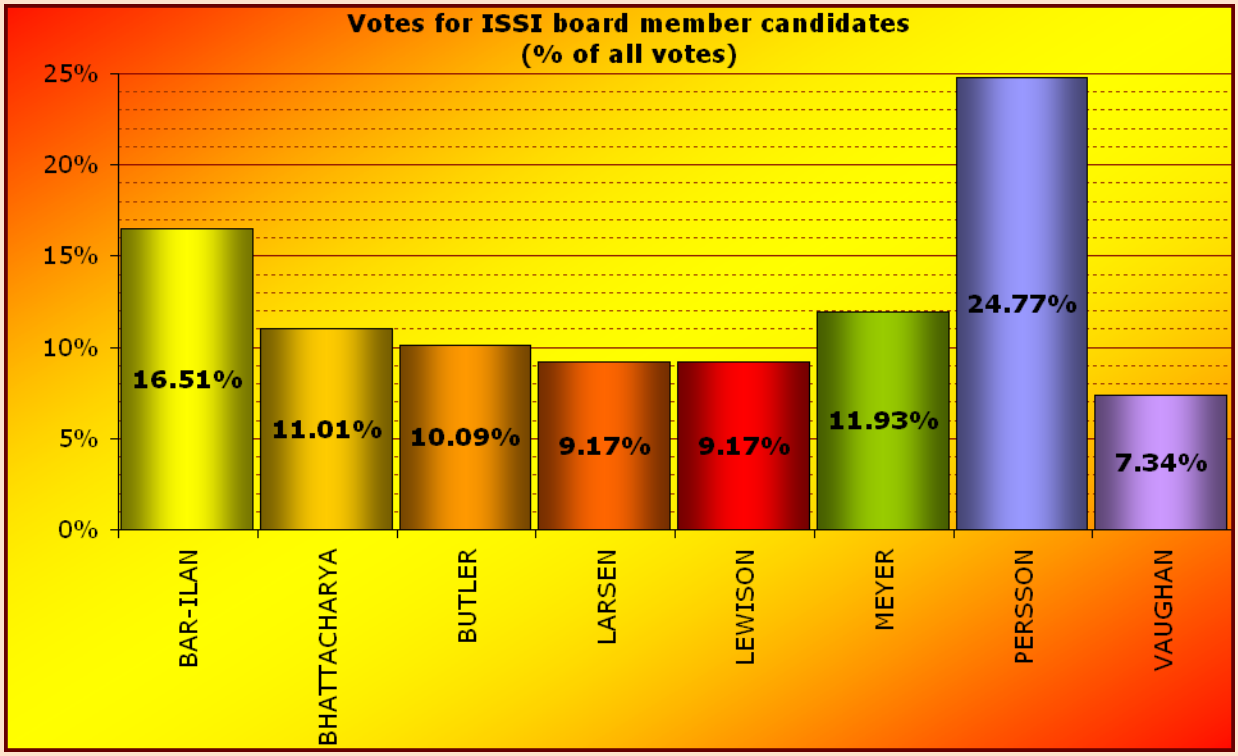
As outgoing president, I want to take this opportunity to give you my thoughts on the last four years and some of the challenges ahead as I see them. First I want to thank the society and the board for their support, and give special thanks to Wolfgang Glänzel and Balázs Schlemmer for their efforts to move the society forward on several important fronts. One major accomplishment was the conduct of elections. We now have in place a very open and democratic process for electing the president and the board, conducted for the first time electronically through the ISSI web site. The results of the board elections will be announced shortly (*see them at the bottom of the next page – remark of the technical editor*), and I want to thank all the nominees for their willingness to participate. If there was a lesson to be learned from the election process, it is the need to encourage wider member



participation in the voting process. The low turnout may be due to the fact that this is the first election we have held in this manner. But it also relates to the need to increase our membership so more are eligible to vote. I am encouraged to hear from the Madrid conference organizers that there were about 200 papers submitted to the conference, of which about one-half were accepted for presentation, certainly an indication of the vitality of the field. Our challenge is to figure out how to convince those authors to become members of ISSI. Other societies require presenters at the conference to be members of the society, and perhaps it is time for us to consider this option.

I am also pleased by our efforts to encourage and foster younger researchers to participate in the field, which is of prime importance to the future of ISSI. The doctoral forum held at our conference in Stockholm and also to be held in Madrid, gives doctoral students a valuable opportunity to present their ideas to and be critiqued by senior researchers. Four years ago, my predecessor Mari Davis and I approached Eugene Garfield with the idea of creating a scholarship for doctoral candidates in fields relevant to ISSI. We are very grateful to Gene for funding this award. The first award was presented at the Stockholm meeting to Kayvan Kousha. The second winner will be announced shortly for the Madrid meeting. It was gratifying to see the many excellent proposals submitted for review, even though this means that the jury members have a difficult time picking a winner. In some ways the challenges facing us are the same ones that Mari Davis posed to me four years ago: how to grow the society membership, put ISSI on sound financial footing, and expand its links to other groups. Four years ago I was concerned that the progress of ISSI would be hampered by not having an official journal. However, my views on this have changed, not the least because we now have two major commercial journals (*Scientometrics* and the *Journal*

ISSI ELECTIONS: RESULTS OF THE BOARD MEMBER ELECTION



The 3 new board members: Olle Persson (SWE), Judit Bar-Ilan (ISR) and Martin Meyer (GBR/FIN/DEU)

of Informetrics) which offer ample opportunity for members to publish, and we have also the ISSI Newsletter which you are reading now. I also realized that the commercial interests of publishers are sometimes at odds with the intellectual objectives of a small society like ISSI, and that coexistence may be preferable to cohabitation. In any event, I hope that in future years more members will take advantage of the ISSI Newsletter as a place to exchange ideas.

The question of relations with other professional societies is similar in some respects to our relations with other publishers. Every society has its own agenda and they are not necessarily compatible with those of ISSI. I was pleased with the willingness of a number of societies to publicize our annual meetings on their web sites. A jointly sponsored session with ASIST a few years ago was a success. However, a similar session at the annual meeting of the 4S society was not as successful, due to low turnout and perhaps divergent methodological views on the study of science. I still think that there are intellectual benefits to approaching other societies with proposals for joint sessions even if they do not share our philosophy, because we do have something unique to offer and we can also broaden our horizons. I therefore encourage ISSI officers and members to continue efforts to reach out to other societies and professional groups with creative ideas for joint activities.

The financial condition of ISSI remains sound, thanks mainly to the membership dues that were collected some years ago. We have had success obtaining funding for our meetings, with contributions from national bodies, such as the Ministry of Education and Science in Spain for the Madrid meeting, and some publishers, such as Thomson Scientific and Elsevier. A more concerted effort is needed in this area if we are to expand our programs. I should also remind members that Thomson Scientific has offered to provide a bibliometric database for scholarly use. Anyone interested should contact me.

No one can predict how ISSI and the fields of scientometrics, informetrics, webometrics, patentometrics, etc. will evolve. I am pleased that our methods are expanding into the new areas of electronic information, beyond the confines of our bibliometric origins. Opportunities for research are expanding every day as metrics of all kinds become of greater interest to policy makers and administrators. We need to be critical and interpretive in our work so outsiders can see its purpose and relevance. It is clear that we are riding a technological wave of innovation in the way that scholars communicate – the massive digitization of the scholarly record, electronic and open access journals, and web repositories. We are in a unique position to exploit these ever richer data sources to study the collective activity of scientists and scholars around the globe. Our future will be shaped by ISSI members who utilize these new resources in novel and creative ways, and our main objective should be to foster such innovative work.

I wish ISSI safe passage, and look forward to seeing all of you at the 11th biennial conference in Madrid.

Henry Small
president of ISSI

NEWS

Professor Dr. Tibor Braun, prominent chemist and one of the pioneers in the fields of bibliometrics, celebrates his 75th birthday this month. The editors of the ISSI Newsletter decided to honour him on the occasion of this event by publishing a special volume of our e-zine (vol. 03-S, 2007). This volume which also appears in print is available for reading and free download as from 17 March 2007. (http://www.issi-society.info/tiborbraun75/)

Grant Lewison:

PROPOSAL FOR A DATABASE OF

BIOMEDICAL RESEARCH ARTICLES CITED BY INTERNATIONAL MEDIA STORIES (BRACIMS)

At the recent COLLNET meeting in New Delhi, in response to an enquiry by Hildrun Kretschmer, its convener, as to how we could collaborate more closely in future, I raised the above as a possibility. It's an idea that I have been considering for a few years, and first raised in Sydney at the Eighth ISSI conference in 2001 (see *Scientometrics*, 2002, vol 54 (2), pp 179-192).

The rationale is the increasingly public nature of biomedical research, both what it has achieved – which is of interest to policy makers, healthcare professionals and the general public – and the conditions under which it takes place. These may include restrictions on embryonic stem-cell experimentation, on research using animals, especially primates, and informed ethical consent for clinical trials. A window on this scene is provided by the news stories about biomedical research that appear in newspapers, and on radio and television, in many countries. These often cite research papers, and in total they would also provide a new measure of the international impact of such papers.

This would complement the counts of research paper citations recorded by the *Science Citation Index* and now by *Scopus*. But whereas these are proprietary databases produced centrally, the BRACIMS database would be decentralised, and freely available to all its participants, who would include both individual data recorders/contributors and financial supporters of their work in different countries. All contributors would need to agree to work to common standards, using standard thesauri, and would in return enjoy access to an increasingly rich resource as the network developed and expanded.

Any ISSI members (or other readers) who might be interested to participate in this project are invited to write to me at glewisonxx@aol.com or at g.lewison@ucl.ac.uk for more details.

THE AR-INDEX: COMPLEMENTING THE H-INDEX

Bihui Jin

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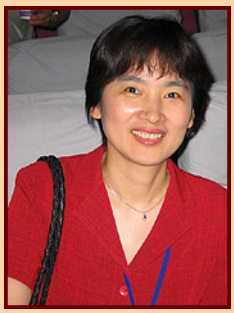

The h-index was introduced by J. E. Hirsch (2005) as an indicator for lifetime achievement. Considering a scientists list of publications, ranked according to the number of citations received, the h-index is defined as the highest rank such that the first h publications received each at least h citations. All publications ranked between ranks 1 and h form the Hirsch core (in case of ties preference is given to younger articles). Although the h-index has several advantages, it has also some disadvantages such as the fact that it lacks sensitivity to performance changes. In particular it can never decrease and does not take the actual number of citations into account.

For this reason I propose the AR-index as a complement of the h-index. The AR-index is defined as the square root of the sum of the average number of citations per year of articles included in the h-core. As a formula this is:

$$AR = \sqrt{\sum_{p \in H} \frac{cit_p}{a_p}}$$

where H denotes the Hirsch core, p denotes a publication, and cit_p and a_p denote the number of citations received and the age of article p, respectively. The term AR-index refers to the fact that this is an **a**ge-dependent index calculated using a square **r**oot. If all cit_p are equal to h, and all a_p are equal to one then AR = h (explaining the reason for taking a square root).

Besides employing the actual number of citations to articles belonging to the h-core as a parameter, the AR-index also takes the age of publications into account. In this way, the h-index is complemented by an index that can actually decrease. Such behaviour is, in my opinion, a necessary condition for a good research evaluation indicator. Consequently, the pair (h, AR) is proposed as a meaningful indicator for research evaluation. Of course, as the definition of h is not changed, only the second element of this pair may possibly decrease. When using this pair for research evaluation I, moreover, suggest applying a suitable publication and citation window.

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A SCIENTOMETRIC LOOK AT SCHOLARLY COOPERATION BETWEEN EUROPE AND ISRAEL. AN EXPLORATIVE STUDY OF A CHANGING LANDSCAPE

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Introduction

The international flavor of Israeli research and development is changing. The United States have till recently been the largest foreign supporter of science in Israel. Lately, however, other international players have entered the field – notably the European Union through the Research Framework Programme.[1] The European Union is altering the Israeli S&T landscape – creating a new alliance.

There is evidence of a decrease in USA federal funding levels vis-à-vis Israeli basic research. Some argue that this funding decrease, combined with Israeli's entry into the European Union Research Framework Programme signals a shift in Israel's orientation away from the United States. Europe will soon reach parity (if not surpass) the USA with regard to the funding of research and the joint conduct of science in Israel.

Empirical evidence from the large multidisciplinary bibliographic database *Science Citation Index Expanded* (SCIE) of *Thomson Scientific* (Philadelphia, PA, USA) clearly supports this assertion. In what follows, we will have a closer look at the evolution of scientific collaboration between Israel and the US, the European Union and Israel's most important partners in scientific research. The analysis is based on the three years 1991, 1998 and 2005 to the study the evolution during the fifteen-year period 1991-2005. In order to maintain continuity and to avoid possible biases caused by publications in 2005 from the new member countries joining the European Union in 2004, we restrict the analysis on the EU15 for the full period 1991-2005.

Methods and results

Although scientific collaboration cannot always be depicted by co-authorship in an adequate manner (e.g., *Katz* and *Martin*, 1973), joint publications are one of the most tangible and well documented forms of collaboration in research. Above all, international collaboration, which is usually well acknowledged in the published literature, is a good indicator of co-operation at this level (*Glänzel* and *Schubert*, 2004).

A first look at the publication data reveals a strong increase of Israel's international cooperativity. Israel increased publication output according to the SCIE by about two thirds in the period 1991-2005 but the number of internationally co-authored papers has more than doubled in the same time. Thus, Israel's share of internationally co-authored papers in the sciences grew from 31.8% in 1991 to 38.8% in 1998 and finally to 41.9% in 2005. With regard to authorship statistics, the percent of papers published by Israeli researchers and co-authored with US authors, that is, the share of US-Israeli co-operation in all internationally co-authored publications of Israel has indeed gone down. The share of EU15 collaboration in all Israeli 'international' papers, on the other hand, has considerably grown. This trend is presented in Figure 1. Nevertheless, with more than 50% of all international papers of Israel, the United States is still Israel's most important partner. These results are in line with the calculations prepared for the United States-Israel Educational Foundation (USIEF) by Gideon Czapski[2] (Hebrew University in Jerusalem, HUJI) on the basis of the *Science Citation Index* (SCI) database (Thomson Scientific, Philadelphia, PA, USA). A further look reveals that among the European countries Germany, France, UK, Italy and the Netherlands are presently Israel's most important partners in Europe. The evolution of their contribution to Israel's international co-publications can be found in Table 1. Only those countries, which are contributing with at least 5% to all international co-publications of Israel, are presented here.

Table 1 Evolution of the share of international collaboration of Israel's most important partners in all Israeli co-publications in 1991, 1998 and 2005

Country	1991	1998	2005
USA	64.3%	55.1%	53.2%
Germany	12.2%	16.1%	15.2%
France	6.8%	9.0%	10.6%
UK	6.5%	9.4%	9.5%
Italy	2.4%	5.9%	7.4%
Canada	6.0%	6.8%	6.7%
Netherlands	1.8%	4.0%	5.3%

Of course, the question arises of in how far this trend mirrors the decline in the overall percentage of the US output in world total in scientific articles that has already been reported in several European studies (e.g., REIST-2, REIST-3). The share of the US output was shrinking from 35.6% in 1991 to 30.5% in 2005 (cf. *Glänzel* et al., 2007). The decline in the relative prominence of the US as a scientific partner for Israel as measured by article coauthorship may to a certain extent be explained by a decline in the relative prominence of the US in the world science overall. Taking into account that also the EU15 is losing weight in the world total since about the Millennium change, mirroring the relative decline of the USA and Japan (*Glänzel* et al., 2007), and intensification of EU-Israel co-operation has continued after 1998, this global

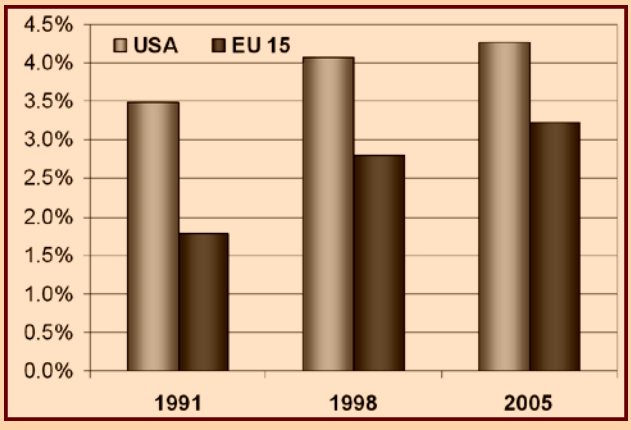

Figure 1 The evolution of the share of US and EU co-authorship in all Israeli SCIE-publications with nonIsraeli co-authors

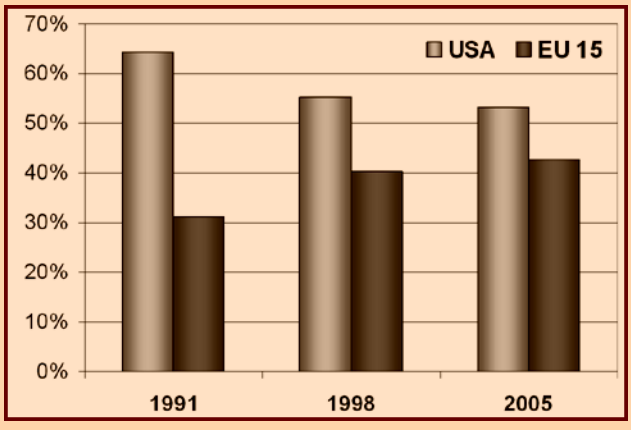

Figure 2 The evolution of the strength of Israel's co-authorship links with US and EU according to Salton's measure

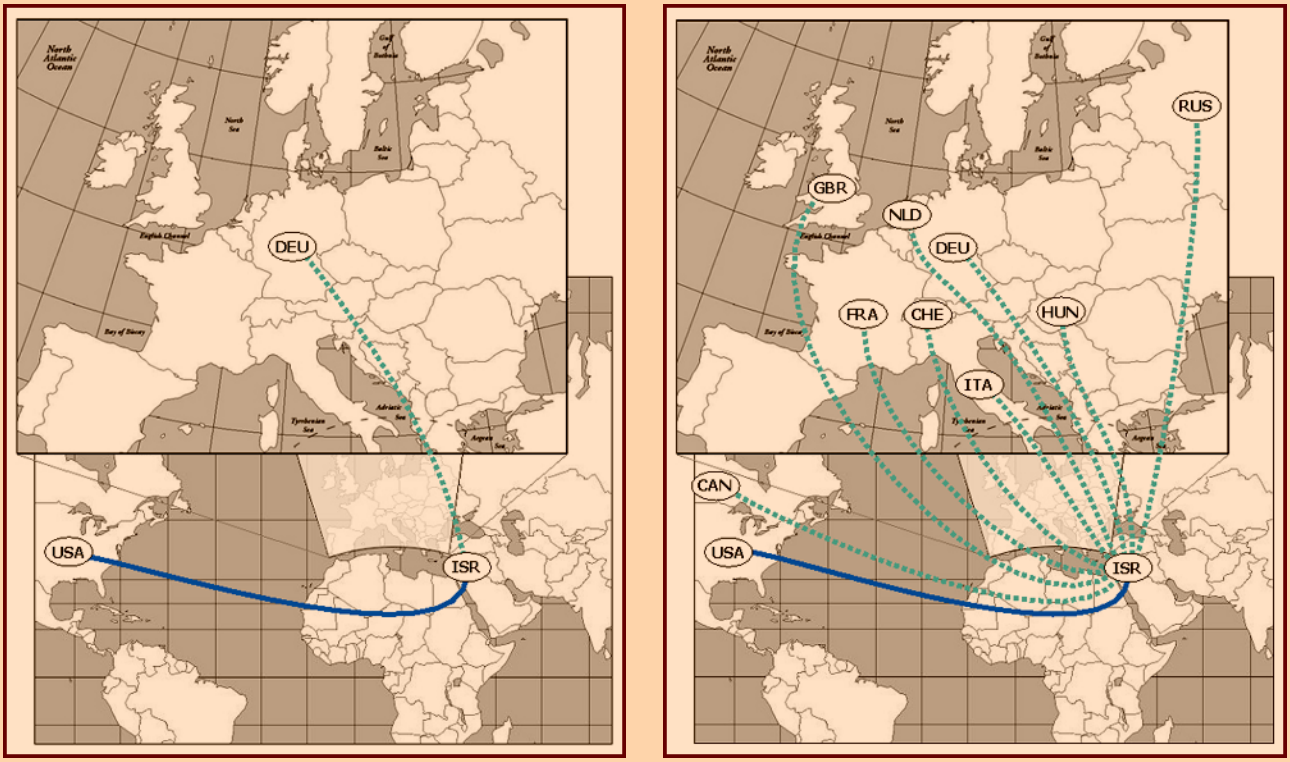

Figure 3 Co-authorship map for Israel in all fields combined in 1991(left) and 2005 (right) based on Salton's measure (dotted line ≥1.0%, solid line ≥2.5%, thick line ≥5.0%)

trend cannot explain all aspects of the evolution of bilateral relations alone. Thus, the 'weight' of the US might be lessening because the 'weight' of others like China, Brazil, Taiwan, Korea, India and Turkey is rising, but this phenomenon presently holds to a lesser extent for the EU15, too (*Zhou* and *Leydesdorff*, 2006, *Glänzel* et al., 2007). Although changes in national publication output might not have an immediate effect on bilateral relations, they do influence the strength of bilateral co-publication links.

We use Salton's (cosine) measure as an indicator of international collaboration strength. This measure is defined as the number of joint publications divided by the square root of the product of the number (i.e., the geometric mean) of total publication outputs of the corresponding pair of countries (cf. *Glänzel*, 2001). Consequently, the strength of a bilateral co-operation might change even if the share of bilateral papers in the output of one of the countries is unchanged but that of the other one increases or decreases. Thus, Figure 2 supplements Figure 1 by taking into account the publication dynamics of Israel's partners, as well. According to the Salton measure, the strength of co-operation link with the US is still increasing, however, to a lesser extent than that with the EU. The change of scholarly co-operation between Israel and Europe can best be visualized by 'scientopograhical' maps. Figure 3 presents Israel's most important scientific co-operation partners in the world in 1991 and 2005. We have used three different thresholds 1.0%, 2.5% and 5.0% to visualise the intensity of co-operation. The strength of 5% is however not reached by any link. The growing number of medium strong links substantiates the increasing role of Europe as Israel's partner in scientific research.

Conclusions

The emergence of the European Framework Programmes has resulted in more co-operation between European countries among themselves and with others (see, e.g., REIST-2, REIST-3). This holds for Israel, Greece, and other countries that were focused on the US but have since widened their co-operation net, and this has included increases within Europe. The increase in collaboration has been documented in the above-mentioned European studies.

In future papers (*Zimmerman* et al., 2007) we will also include citation analysis in order to measure the reception of the results of joint Israel-EU research by the world's scientific community as well as technology transfer

agreements and patent data to broaden the scope of the study. Furthermore, we will discuss the Israeli culture/model of research and innovation financing (e.g. entrepreneurship, venture capital and Office of the Chief Scientist programs) and how this might serve as a model for Europe, given the Lisbon Agenda aimed at promoting economic growth, fostering competitiveness and stimulating job creation.

Acknowledgement

The authors wish to thank Balázs Schlemmer for his creative assistance in preparing the figures of this paper.

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Footnotes

[1] Israel has been an associate Member state of the Framework Programs since mid-way through the FP4; we are now in FP7.

[2] Presented at a Fulbright Israel workshop, Herzliya, 2005.

CARTOON