9-1-2007

Focus on Turkey: the influence on policy on research output

Country trends
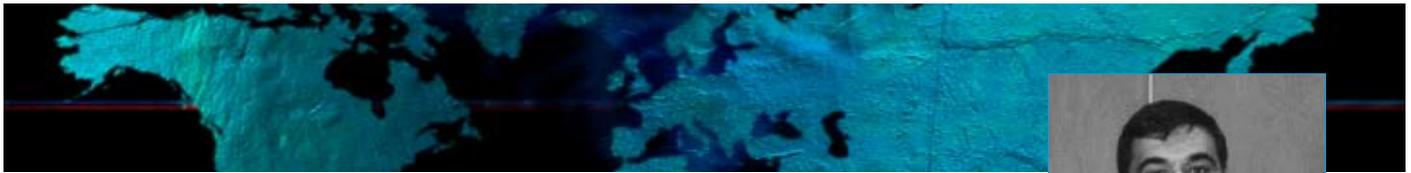
Focus on Turkey: the influence of policy on research output

With a special contribution from Professor Cem Saraç

When describing research, the American astronomer Dr. Carl Sagan was quoted as saying, "Somewhere, something incredible is waiting to be known." This inspiring quotation reflects the fact that research exists in all parts of the world (and indeed outside of the world, as in the case of Astronomy) and that researchers collaborate to produce incredible breakthroughs in every country. This is the first in a series of articles that reflect the global nature of research. The series covers research trends across countries, and investigates the proliferation of research communication throughout the world.

We are focussing our first analysis on Turkey, a country that has shown strong growth in article output in recent years (see Figure 1 below).
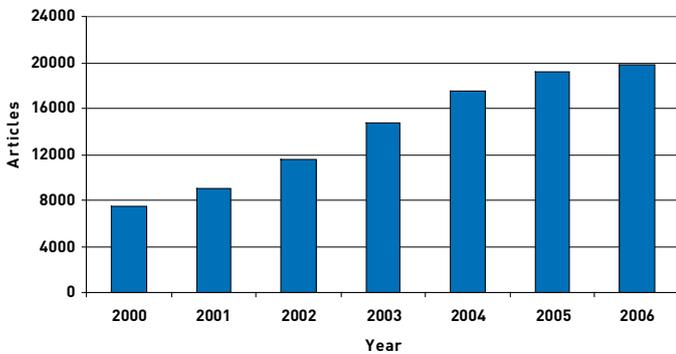

Figure 1 – Output of journal research articles in Turkey 2000–2006
Source: Scopus

The increase in research articles across this period is occurring at an average rate of 17% per annum over the period 2000-2006, as compared with a 3.5% p.a. overall growth in the same period. But how can we explain this increase? Certainly the OECD Main Science and Technology Indicators Vol. 2007 *(1)* identify trends in data, which match this increase in research articles. Figure 2 illustrates the growth in the number of researchers based in Turkey. Comparing the data in the two graphs, we can conclude that the more researchers in a country, the more articles are written and published from institutions within that country.
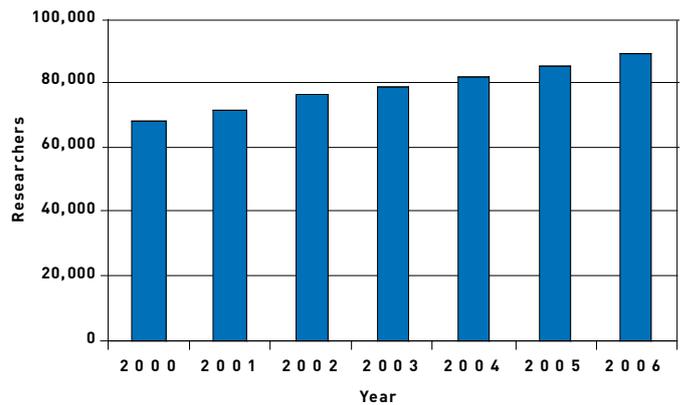

Figure 2 – Researchers active in R&D in Turkey 2000-2004
Source: OSYM 2007 *(2)*

This increase in research articles and number of researchers is also matched by the increase in funding of higher education (HE) within Turkey; Figure 3 illustrates the growth in HE funding across the same period.
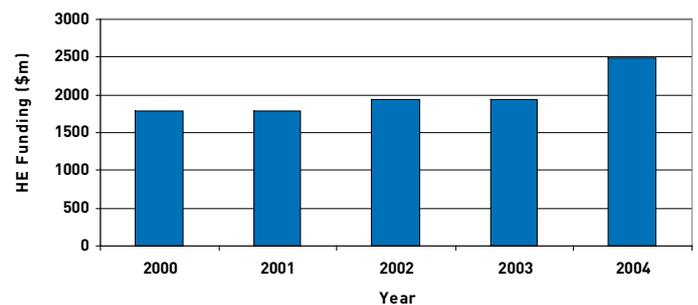
Figure 3 – Higher education funding in Turkey 2000-2004
Source: OECD

While these indicators continue to increase, the difference between subject fields is also evident. Figure 4 illustrates the subject breakdown of Turkish research in 2006 in Scopus and demonstrates that medical and life science research is currently leading the way in terms of published output, but that significant contributions are also being made to the physical and mathematical sciences.
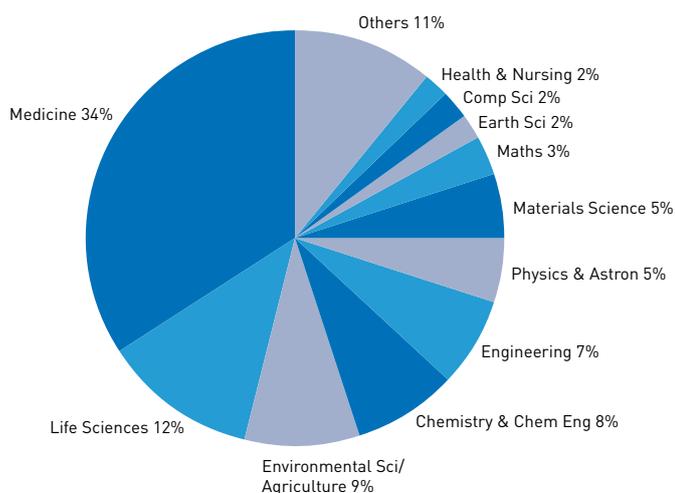
Continued from page 3

Figure 4 – Subject focus of Turkish research articles 2006
Source: Scopus

A clear relationship exists between research funding, researcher population and article outputs at a national level, and Turkey is no exception. Data like this can inform and guide policymakers at all levels to leverage the infrastructure of the national science system and cultivate a knowledge economy.

As an 'insider' so to speak, Cem Saraç, Professor of Engineering at Hacettepe University, Ankara, says there are two principle reasons that could explain the figures in the tables above *(3)*. Both relate to policy changes. "The first one can be linked to the

Turkish Ministry of Health's strategy," he says. Indeed, OECD figures *(4)* show that health spending per capita in Turkey grew, in real terms, by an average of 5.8% per year between 2000 and 2005. This was one of the fastest growth rates in OECD countries and significantly higher than the OECD average of 4.3% per year. In addition, as part of a nationwide performance-based contribution payment system *(5)*, implemented in training and research hospitals in 2004, clinic and deputy chiefs, chief interns and specialists receive additional scores providing they publish a definite number of papers.

"The second reason for the significant growth is the prerequisites, generally initiated after 2000, for applying for university degrees at Lecturer, Assistant Professor, Associate Professor and Full Professor levels," he continues. "My university stipulates that one has to write at least three international papers in order to apply for an Associate Professor Degree and another four international papers for a Full Professor Degree. While each university has its own requirements, prerequisites like these could also have affected article growth."

References:

(1) OECD *Main Science and Technology Indicators*, Vol. 2007

(2) OSYM (2007), Student Selection and Placement Center, Research and Publishing, from the **World Wide Web**

(3) Demirel, I.H., Sarac, C. and Ozgen T. (2007) "Science in Turkey, 1973–2006". *Science Magazine, AAAS*.

(4) OECD (2007) "OECD Health Data 2007, How Does Turkey Compare", Retrieved September 21, 2007 from the **World Wide Web**

(5) The Ministry of Health of Turkey "Performance-based payment system in the Ministry of Health Practices", Retrieved September 21, 2007 from the **World Wide Web**

Research trends

Country analysis: examining the numbers

Research evaluation at country or national level is moving increasingly towards a metric-based system. The most obvious examples of these countries are Australia, with the Research Quality Framework, and the United Kingdom, with the Research Assessment Exercise, where policymakers and administrators are being called upon to submit metrics for national evaluation.

It is interesting to extract two of the indicators researchers, policymakers and administrators focus on, namely article count and citations received at country level. The differences in the number of articles published in each country may not be unexpected but the top 1% and 5% citation thresholds certainly warrant further attention.

Methodology

An analysis was performed in Scopus to extrapolate the top 1% and 5% of cited papers for ten randomly selected countries within 27 subject categories. The results of this analysis can be found in Table 1 (downloadable at **www.researchtrends.com**).

The table denotes the number of papers published in each country for a period of five individual years from 2002-6. These counts are then separated into 27 subject categories (as specified in Scopus.com). For each of these years and for each subject category, the number of papers that forms a part of the top 1% of highly cited papers was derived.

For the purpose of this analysis, it is important to note that the