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The Effect of Foreign Science Policy on U.S. Research

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The Effect of Foreign Science Policy on U.S. Research

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Abstract-Increased emphasis on strengthening national scientific communities has been seen around the world in recent decades. The US scientific community will feel the effects.

The global scientific landscape has changed. Over the past decade many governments became convinced that their economic futures lay with knowledge-based economies in which research is central. Governments sought to strengthen national research, swiftly building capability and fostering a sharper competitive culture. As a result, foreign scientific communities have become more competitive and publication output increased – Fig. 1. From within the fast-paced US research community these changes may be little noticed, their significance obscure. The effects of these changes have been easy to underestimate because the size of the US scientific enterprise still dwarfs that of any other country (though the scientific output of the EU is now larger – Fig. 1). Nevertheless, in aggregate these shifts are beginning to have an impact on US research.

Around the world governments’ science policy trajectories and goals are clear and so we can imagine the world we might inhabit a few years hence. Fig. 1 extrapolates recent trends in scientific output through 2018 for the US, EU and Asian countries. These extrapolations suggest that 10 years hence, we may see US scientists publishing less than EU scientists or scientists from Asian countries in aggregate (China, India, Japan, South Korea, Taiwan, Singapore), see Fig. 2.

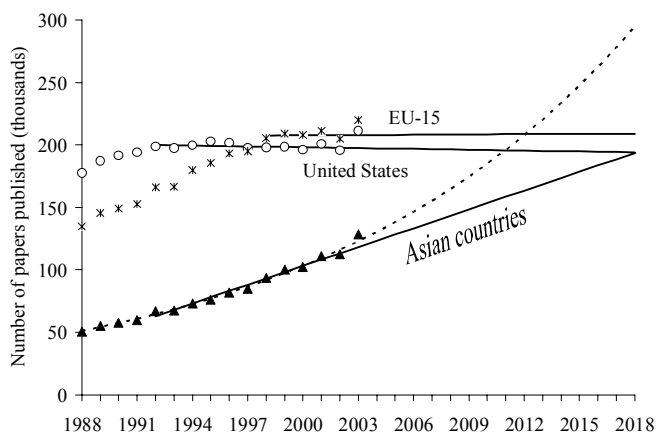


Fig. 1. Number of papers published through 2003 and extrapolation: US, EU, Asian countries. Data source [1].

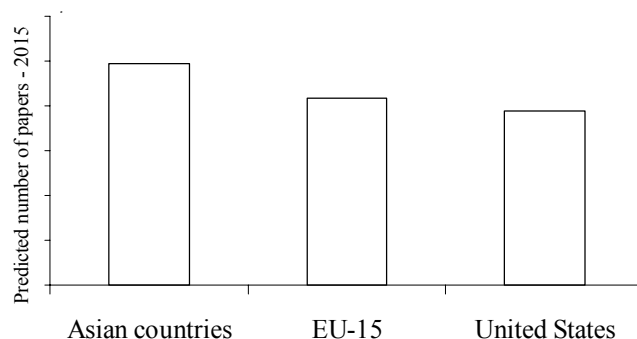


Fig. 2 Predicted number of papers published by scientists in Asia, EU and US in 2015

If this prediction comes to pass, it will have several implications for US scientists. In 2015, science and technology will advance even faster than they do at present. More diverse approaches will be brought to bear on tough problems which will accelerate their solution. At the personal level, US scientists will compete for the best students and for corporate research support not just with other US universities but with Asian and European universities. And US scientists will have to compete for limited space in top journals not just with other US scientists, but with more and better scientists from around the world. Races to patent discoveries will involve more players. Inevitably, this will reduce the perceived achievements of younger generations of US scientists, who though they will work far harder than previous generations will seem somehow not to command the same dominating position in world science as did their predecessors.

We seem to be entering a new era in science policy. The U.S. has long accepted that its share of world scientific output will decline as scientific communities in other countries strengthen. This process seems to have accelerated sharply, as other governments have become convinced that their economic futures lie with knowledge-based economies in which research plays a central role. Foreign scientific communities have become much more competitive at the same time as the Federal government's attention is increasingly focused on sciences closely linked to medical care.

The institutions of modern science have in many ways been a gift from the United States to the rest of the world. The U.S. has demonstrated that the best quality scientific research is fostered when funding is awarded competitively, plentiful rigorously trained PhD students and postdocs are available

cheaply, substantial amounts of money are spent, modern equipment is used, and transfer of research to technological application is encouraged. In many ways, other countries have sought over the past decade to incorporate more of these elements into their systems. Furthermore, the U.S. has probably trained or at some point employed many of the

scientists now doing so well back home. As a result, American universities no longer stand alone at the scientific frontier.

REFERENCES

[1] National Science Board. 2006. *Science and Engineering Indicators 2006*. Two volumes. Arlington, VA: National Science Foundation (volume 1, NSB 06-01; volume 2, NSB 06-01A).