

THE NEW YORK TIMES

February 16, 2006

Outsourcing Is Climbing Skills Ladder

By STEVE LOHR

The globalization of work tends to start from the bottom up. The first jobs to be moved abroad are typically simple assembly tasks, followed by manufacturing, and later, skilled work like computer programming. At the end of this progression is the work done by scientists and engineers in research and development laboratories.

A new study that will be presented today to the National Academies, the nation's leading advisory groups on science and technology, suggests that more and more research work at corporations will be sent to fast-growing economies with strong education systems, like China and India.

In a survey of more than 200 multinational corporations on their research center decisions, 38 percent said they planned to "change substantially" the worldwide distribution of their research and development work over the next three years — with the booming markets of China and India, and their world-class scientists, attracting the greatest increase in projects.

Whether placing research centers in their home countries or overseas, the study said, companies often use similar criteria. The quality of scientists and engineers and their proximity to research centers are crucial.

The study contended that lower labor costs in emerging markets are not the major reason for hiring researchers overseas, though they are a consideration. Tax incentives do not matter much, it said.

Instead, the report found that multinational corporations were global shoppers for talent. The companies want to nurture close links with leading universities in emerging markets to work with professors and to hire promising graduates.

"The story comes through loud and clear in the data," said Marie Thursby, an author of the study and a professor at Georgia Tech's college of management. "You have to have an environment that fosters the development of a high-quality work force and productive collaboration between corporations and universities if America wants to maintain a competitive advantage in research and development."

The multinationals, representing 15 industries, were from the United States and Western Europe. The authors said there was no statistically significant difference between the American and European companies.

Dow Chemical is one company that plans to invest heavily in new research and development centers in China and India. It is building a research center in Shanghai, which will employ 600 technical workers when it is completed next year. Dow is also finishing plans for a large installation in India, said William F. Banholzer, Dow's chief technology officer.

Today, the company employs 5,700 scientists worldwide, about 4,000 of them in the United States and Canada, and most of the rest in Europe. But the moves overseas will alter that. "There will be a major shift for us," Mr. Banholzer said.

The swift economic growth in China and India, he said, is part of the appeal because products and processes often have to be tailored for local conditions. The rising skill of the scientists abroad is another reason. "There are so many smart people over there," Mr. Banholzer said. "There is no monopoly on brains, and none on education either."

Such views were echoed by other senior technology executives, whose companies are increasing their research employment abroad. "We go with the flow, to find the best minds we can anywhere in the world," said Nicholas M. Donofrio, executive vice president for technology and innovation at I.B.M., which first set up research labs in India and China in the 1990's. The company is announcing today that it is opening a software and services lab in Bangalore, India.

At Hewlett-Packard, which opened an Indian lab in 2002 and is starting one in China, Richard H. Lampman, senior vice president for research, points to the spread of innovation around the world. "If your company is going to be a global leader, you have to understand what's going on in the rest of the world," he said.

The globalization of research investment, industry executives and academics argued, need not harm the United States. In research, as in economics, they said, growth abroad does not mean stagnation at home — and typically the benefits outweigh the costs.

Still, more companies in the survey said they planned to decrease research and development employment in the United States and Europe than planned to increase employment.

In numerical terms, scientists and engineers in research labs represent a relatively small part of the national work force. Like the debate about offshore outsourcing in general, the trend, which may point to a loss of competitiveness, is more significant than the quantity of jobs involved.

The American executives who are planning to send work abroad express concern about what they regard as an incipient erosion of scientific prowess in this country, pointing to the lagging math and science proficiency of American high school students and the reluctance of some college graduates to pursue careers in science and engineering.

"For a company, the reality is that we have a lot of options," Mr. Banholzer of Dow Chemical said. "But my personal worry is that an educated, innovative science and engineering work force is vital to the economy. If that slips, it is going to hurt the United States in the long run."

Some university administrators see the same trend. "This is part of an incredible tectonic shift that is occurring," said A. Richard Newton, dean of the college of engineering at the University of California, Berkeley, "and we've got to think about this more profoundly than we have in the past. Berkeley and other leading American universities, he said, are now competing in a global market for talent. His strategy is to become an aggressive acquirer. He is trying to get Tsinghua University in Beijing and some leading technical universities in India to set up satellite schools linked to Berkeley. The university has 90 acres in Richmond, Calif., that he thinks would be an ideal site.

"I want to get them here, make Berkeley the intellectual hub of the planet, and they won't leave," said Mr. Newton, who emigrated from Australia 25 years ago.

The corporate research survey was financed by the Ewing Marion Kauffman Foundation, which supports studies on innovation. It was designed and written by Ms. Thursby, who is also a research associate of the National Bureau of Economic Research, and her husband, Jerry Thursby, who is chairman of the economics department at Emory University in Atlanta.