

- Are Elite Universities Losing Their Competitive Edge?
- Abortion and Selection
- The Impact of Foreign Students on the Earnings of Doctorates
- Intensive Care Reduces Disability after Cardiovascular Disease

December 2006

Are Elite Universities Losing Their Competitive Edge?

For centuries, physical access to other researchers has facilitated all forms of knowledge-based production. Universities occupy physical campuses, and residence at an elite university in close proximity to other scholars has long been thought to increase research productivity.

Nonetheless, the future may be different. In **Are Elite Universities Losing Their Competitive Edge?** (NBER Working Paper No. 12245) co-authors **E. Han Kim, Adair Morse, and Luigi Zingales** conclude that advances in information technology over the last three decades have greatly diminished the importance of physical proximity. As a result, academics now are less attracted to universities with highly productive faculty members. These conclusions are based on career information for 1970 to 2001 for all individuals in economics or finance who have ever had either a tenure track or visiting position in any of a list of 25 leading universities. Four measures of research productivity—number of articles written, published pages, citations, and impact-weighted page counts—were calculated for each individual. To isolate the effect

of university residence, the authors control for individual differences in average productivity, experience and professorial rank, overall faculty quality, the presence of non-productive colleagues, the quality of the Ph.D. program, whether the

clude that the “bad influence of non-productive colleagues seems to extend well beyond the opportunity cost of positions occupied by unproductive employees.”

Kim, Morse, and Zingales also reason that the benefits of phys-

“Advances in information technology over the last three decades have greatly diminished the importance of physical proximity.”

school is a state school, the average annual snowfall, and the distance to the closest metropolitan city.

In general, the measures used in the article suggest that although professorial research productivity declines with age and experience, a faculty member who moved to Harvard from a school not on the top-25 list in the 1970s could expect to almost double his research productivity. At the time, research productivity would have increased by moving to any of 17 of the schools on the top-25 list of economics departments. By the 1990s, the effect of moving to a top economics department had declined. Only two schools out of the 25 were likely to increase an individual’s productivity. While knowledge spillovers have declined, cultural norms still seem to matter. The authors con-

clude that the “bad influence of non-productive colleagues seems to extend well beyond the opportunity cost of positions occupied by unproductive employees.”

Kim, Morse, and Zingales also reason that the benefits of physical proximity may have allowed the best schools to offer somewhat lower salaries. As improving communications from 1970 to 2000 eroded the benefits of physical proximity, salaries at elite universities might have been expected to rise, because those schools no longer could retain faculty simply by offering more interaction with better colleagues. The salary data from 1968 to 2000 seem to support this, suggesting that that “elite universities are no longer able to retain star faculty on the strength of their reputation alone. Upcoming universities now compete on a more level playing field to attract productive faculty.”

— Linda Gorman

Abortion and Selection

The legalization of abortion in the United States in the early 1970s represents one of the most important changes in American social policy in the twentieth century. In addition to its obvious implications for the likelihood of giving birth in the case of an unintended pregnancy, the social significance of this change is much broader. For example, the legalization of abortion may have altered the characteristics and achievement of entire groups of children. In particular, children's outcomes may have improved, on average, because they were more likely to be born into a household in which they were wanted. This phenomenon is referred to as "selection."

In **Abortion and Selection** (NBER Working Paper No. 12150), co-authors **Elizabeth Oltmans Ananat, Jonathan Gruber, Phillip Levine, and Douglas Staiger** examine whether there is evidence supporting selection resulting from abortion legalization by focusing on a broad array of characteristics of children born in the early 1970s. Those children are now in their thirties, so the authors examine a number of adult outcomes, including completed educational attainment, employment, poverty status, and criminal activity. Their data come from the 2000 Census.

To estimate the impact of changes in abortion access on the adult characteristics of children born in the early 1970s, the authors partially rely on differential timing in abortion legalization across states. Fewer children were born in states like California and New York that

"Children who were 'born unwanted' prior to the legalization of abortion not only grew up in more disadvantaged households, but also grew up to be more disadvantaged as adults."

legalized abortion around 1970 relative to the remainder of the country, in which abortion was not legalized until 1973. Even after abortion was legalized nationwide, women in more liberal states were more likely to take advantage of its availability. In those states and years in which abortion was used at differentially higher rates, we should see improvements in the adult characteristics of children born if this selection effect were in operation.

In fact, the authors find consistent evidence of changes in the nature of groups born in the 1970s due to greater access to abortion. A child who would have been born if abortion were not available would have been 23 to 69 percent more likely to be a single parent, 73 to 194 percent more likely to receive welfare, and 12 to 31 percent less

likely to graduate from college. The researchers also replicate the much-cited results from earlier studies that abortion access lowered crime rates years later. However, their analysis suggests that the crime reduction was not due to differential selection, but instead was primarily due to the fact

that there were fewer teens around to commit crime in the years after abortion was made available.

Taken together with earlier research results, the authors' findings suggest that the improved living circumstances experienced by children born after the legalization of abortion had a lasting impact on their lifelong prospects. Children who were "born unwanted" prior to the legalization of abortion not only grew up in more disadvantaged households, but also grew up to be more disadvantaged as adults. This conclusion is in line with a broad literature documenting the intergenerational correlation in income and showing that adverse living circumstances as a child are associated with poorer outcomes as an adult.

— Les Picker

The Impact of Foreign Students on the Earnings of Doctorates

In **Immigration in High-Skill Labor Markets: The Impact of Foreign Students on the Earnings of Doctorates** (NBER Working Paper No. 12085), NBER Research

Associate **George Borjas** analyzes the effect of the large number of foreign students who earned doctorates in science and engineering between 1968 and 2000 on the wages of PhDs

in those fields. He uses data from the Survey of Earned Doctorates and the Survey of Doctoral Recipients. In the 1970s, Borjas notes, nearly 20 percent of those earning science and

engineering doctorates were foreign-born students who intended to stay in the United States. By the 1990s, that number was over 33 percent.

Foreign doctoral students are not equally distributed across the various science-and-engineering fields, however. In the 1990s, more than half of the doctorates awarded in civil engineering were earned by foreign-born students intending to stay in the United States, while in psychology, the fraction was only 5 percent; in health and related sciences it was almost 17 percent; in biological sciences it was over 27 percent; and, in electrical and mechanical engineering it was roughly 49 percent.

As the number of people with doctoral degrees has increased, it has become more common for PhDs in some fields to take a post-doctoral appointment (a “post-doc”) as their first job rather than to proceed to a more secure, and higher paying, permanent appointment. The number of young PhDs in post-doctoral positions is nearly 29 percent in the biological sciences, over 17 percent in physics, and almost 10 percent in chemistry. Yet, on average, a post-doc under the age of 40 earns \$36,000 a year while the average salary for a regular appointment is approximately \$65,900 a year. According to the 2000 Census, U.S. men with undergraduate degrees who were between the ages of 25 and 29 earned an aver-

age of \$33,000; those who were 30–34 years old earned \$42,300. In short, salaries in post-doctoral appointments do not reward the additional years of education required for a Ph.D.

After adjusting for the possibility that the demand for people to fill post-docs is driven by extrane-

“Immigration increased the supply of doctorates in computer science and mechanical engineering by 36 percent, causing wages to fall by an estimated 10 percent.”

ous factors, like increased funding, Borjas concludes that an immigration-induced 10 percent increase in the supply of people with doctorates raises the probability of being employed in a post-doctoral position by about 4 percent. The effect on younger native-born doctoral graduates is even larger. For them, a 10 percent immigration-induced increase in supply increases the probability of employment as a post-doctoral by nearly 22 percent.

Immigration also appears to affect the wages of those who do not take post-docs. Between 1993 and 2001, immigration increased the supply of doctorates in all fields by an average of almost 14 percent. The wage of the average worker with a doctorate in science or engineering fell by close to 4 percent. In some fields, the effect was much larger. Immigration increased the supply of

doctorates in computer science and mechanical engineering by 36 percent, causing wages to fall by an estimated 10 percent. In all, the influx of foreign students reduced the wage *growth* of science and engineering PhDs by about 40 percent.

Borjas notes that low returns to earned doctorates may cause bright

undergraduates born in the United States to pursue professional occupations in which wages have not been depressed by immigration. As a result, research labs employing large numbers of post-docs will find that “natives do not want to do the type of work that immigrants do,” at least not at the wages they offer. This encourages the labs to press for more recruiting from abroad, with the result that wages for PhDs will continue to be depressed. Borjas cautions that it would be a mistake to assume that lower wages for PhDs is necessarily bad policy. Although immigration may reduce the economic returns to earning a doctorate in the United States, having more skilled labor in the population also may lead to more, and more rapid, scientific discovery. If that is the case, then the overall benefit from high-skill immigration could be very large.

— Linda Gorman

Intensive Care Reduces Disability after Cardiovascular Disease

Disability among the elderly has declined markedly in the United States in the past two decades. In 1984, 25 percent of the elderly population reported difficulty with activities associated with independent liv-

ing. By 1999, the share had fallen to 20 percent, a decline of one-fifth. Although these basic facts are well known, their interpretation is not clear. Is the reduction in disability a result of improved medical care,

individual behavioral changes, environmental modifications that allow the elderly to better function by themselves, or other demographic changes? Will the trend continue, or is it time limited? What does

the reduction in disability mean for years of healthy life and labor force participation?

In **Intensive Medical Care and Cardiovascular Disease Disability Reductions** (NBER Working Paper No. 12184), co-authors **David Cutler, Mary Beth Landrum, and Kate Stewart** focus on disability caused by cardiovascular disease to investigate the role of improved medical care on reductions in disability. By looking at just one condition, they can analyze health shocks and their outcomes in some detail. Cardiovascular disease is a natural condition to analyze, because it is the most common cause of death in the United States and most other developed countries. Also, more is spent on cardiovascular disease than on any other condition, clearly a case where medical care could really matter.

The authors measure disability as the presence of impairments in Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs). Their data source, the National Long-Term Care Survey (NLTC) of 1984–99, includes information on six ADL

measures: eating, getting in or out of bed, walking around inside, dressing, bathing, and getting to or using the toilet. There are also questions about eight IADL measures: doing light housework or laundry, pre-

“Improvements in medical care, including both increased use of relevant procedures and pharmaceuticals, led to a significant part of this decline in disability.”

paring meals, shopping for groceries, getting around outside, managing money, taking medications, and making telephone calls. The NLTC is a nationally representative longitudinal survey of the health and disability profile of the population aged 65 and over.

Cutler and his co-authors find that reduced disability associated with cardiovascular disease accounts for a significant part of the total reduction in disability — between 14 and 22 percent. The evidence suggests that improvements in medical care, including both increased use of relevant procedures and pharmaceuticals, led to a significant part of this decline in disability. Regions with higher use experienced sub-

stantial reductions in mortality and disability.

While precise data on the implications of reduced disability are lacking, the possible impact of disability reductions is staggering. The authors

estimate that preventing disability after an acute cardiovascular event can add as much as 3.7 years of quality-adjusted life expectancy, or perhaps \$316,000 of value. The cost of this outcome is significantly smaller. The initial treatment costs range from \$8,610 to \$16,332, depending on the procedure used. Further, recent cost analyses reported that annual Medicare spending was lower for the non-disabled than the disabled, which suggests that higher treatment costs may be offset by lower future spending among a more healthy population. By virtually any measure, therefore, the authors conclude that medical technology after acute cardiovascular episodes is worth the cost.

— Les Picker

NBER

The National Bureau of Economic Research is a private nonprofit research organization founded in 1920 and devoted to objective quantitative analysis of the American economy. Its officers are:

Martin Feldstein — President and Chief Executive Officer

Susan Colligan — Vice President for Administration and Budget

Elizabeth E. Bailey — Chairman

John S. Clarkeson — Vice Chairman

Contributions to the National Bureau are tax deductible. Inquiries concerning the contributions may be addressed to Martin Feldstein, President, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

The NBER Digest summarizes selected Working Papers recently produced as part of the Bureau's program of research. Working Papers are intended to make preliminary research results available to economists in the hope of encouraging discussion and suggestions for revision.

The Digest is issued for similar informational purposes and to stimulate discussion of Working Papers before their final publication. Neither the Working Papers nor the Digest has been reviewed by the Board of Directors of the NBER.

The Digest is not copyrighted and may be reproduced freely with appropriate attribution of source. Please provide the NBER's Public Information Department with copies of anything reproduced.

Individual copies of the NBER Working Papers summarized here (and others) are available free of charge to Corporate Associates. For all others, there is a charge of \$5.00 per downloaded paper or \$10.00 per hard copy paper. Outside of the United States, add \$10.00 per order for postage and handling. Advance payment is required on all orders. To order, call the Publications Department at (617) 868-3900 or visit www.nber.org/papers. Please have the Working Paper

Number(s) ready.

Subscriptions to the full NBER Working Paper series include all 700 or more papers published each year. Subscriptions are free to Corporate Associates. For others within the United States, the standard rate for a full subscription is \$3200; for academic libraries and faculty members, \$2300. Higher rates apply for foreign orders. The on-line standard rate for a full subscription is \$1750 and the on-line academic rate is \$725.

Partial Working Paper subscriptions, delineated by program, are also available. For further information, see our Web site, or please write: National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

Requests for Digest subscriptions, changes of address, and cancellations should be sent to Digest, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398. Please include the current mailing label.