uates' unemployment. However, some experts predict that building infrastructure will only provide manual jobs for ordinary workers and will thus benefit college graduates much less.

Another measure is to expand postgraduate enrollments. The Ministry of Education plans to expand enrollment of master's degree students by 5 percent and doctoral students by 1.7 percent. Given the job decline, many graduates choose to study further. This year, 1,246,000 undergraduate degree holders will be taking the postgraduate entrance exams. Yet, expanding postgraduate enrollments cannot solve the problem of graduates' employment; the trend can only offer some relief to or postpone the current employment pressure. In fact, in recent years the employment of master's degree graduates has become problematic.

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Diverting graduates to the rural area is a third measure. However, a vast gap exists in terms of developmental level, opportunities, and living conditions between urban and rural areas. Thus, most graduates prefer to work in cities. To encourage the graduates to go to the countryside, the government has come up with policies such as preferential treatment when graduates (after two-years service) apply to become government officials or extra points are added to their scores in the examination for graduate study. These policies are not attractive as given the low salaries graduates can earn in these areas of the country.

Conclusion

Recently, the Ministry of Education has been calling for the whole society, including overseas Chinese, to contribute ideas to improve Chinese education overall. Promoting creative and vocational education has been raised as a way of providing new graduates with creative education and job skills to meet the needs of the market and face the challenges of a changing world in the decades to come. Perhaps this approach constitutes a more fundamental strategy that will eventually solve the problem of employment of university graduates, but the impact will take many years to become apparent. ■

The Poor and the Rich in US Universities

John Aubrey Douglass and Gregg Thompson

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In the United States, socioeconomic mobility has declined over the past three decades, with lower-income levels and wage and benefit losses among many middle-income families. Of course, the current global financial downturn might only extenuate this divide in the United States and throughout much of the world—despite the best efforts and plans of national leaders, including President Obama.

A number of national studies have pointed to highly selective and elite US private and public universities becoming less accessible to lower-income students. The general assumption, minus any good analytical studies, views students from lower-income families as doing less well in academic performance and sense of belonging at these universities than their more wealthy counterparts.

Disaggregating Institutions

A closer look at first-degree students in a group of highly selective public and private universities tells a more nuanced story. Our study, "The Poor and Rich," focusing on low-income undergraduate students who receive federal Pell Grants (generally for students with less than $40,000 of family income), found considerable differences in the presence of low-income students among selective universities. Further, the findings challenge the prevailing notion that low-income students have significantly less-satisfactory experiences and outcomes than their more wealthy peers—at least in highly selective universities.

On issues of affordability and access, foreign as well as many US observers of American higher education often fail to disaggregate its network of colleges and universities. We tracked the presence of low-income students among a group of 32 public and private selective higher education institutions, including the eight Ivy League institutions and flagship state universities. With some key caveats, public universities are generally much more accessible to low-income students—despite the claims of private institutions that they effectively provide generous discounts in tuition rates and financial aid.

A stark difference exists between the East Coast Ivy League and the University of California (UC)—the latter with some 180,000 undergraduates, the nation's largest and arguably most prestigious public research university system. Collectively, only 11 percent of students in the Ivy League are low income compared to 31 percent in the UC system. The UC campuses of Berkeley, Davis, and Los Angeles each have more Pell Grant students than all the 8 Ivy League institutions combined. Cultural, demographic, and regional differences partly explain why selective private institutions have relatively small numbers of low-income students, in addition to generally much lower tuition among public institutions and the greater availability of financial aid relative to cost.

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For instance, UC draws the vast majority of its students from a demographically diverse California population, many of whom are low income and more than half with recent immigrant backgrounds. UC is not only more accessible than a faraway elite university; it welcomes community college transfer students as part of its mandate to serve the people of California.

In contrast, private institutions seek a national pool for students, have very few transfer students, and tend to be biased in their admissions policies toward students with certain academic characteristics, like high standardized test scores and certain financial and cultural profiles.

A number of public universities enroll relatively low numbers of low-income students as well, correlated with their regional draw of students. The case of the University of Michigan, the University of Wisconsin, and the University of Virginia (with only 12, 11, and 8 percent, respectively, of their students with Pell Grants) have initiated efforts at privatization that includes enrolling largely wealthy out-of-state students to bring in more tuition income.

New Initiatives

To mollify criticism regarding their low number of low-income students, a number of high-profile private and wealthy universities and colleges have recently initiated "progressive" tuition rates, in which up-front tuition costs are lower for low- and some middle-income students. Yet this change still looks like too little too late.

In the coming years the income profiles of students at Ivy League and many other selective privates are likely to change only marginally. The recent dive in the endowments of these institutions will probably make them even less able, and willing, to provide adequate financial aid to bring in more low-income students. Furthermore, their impact on providing access to the less wealthy is limited, in part because most students attend public colleges and universities. The 50 "best" liberal arts colleges in the United States, for example, enrolled collectively less than 0.6 percent of all Pell Grant enrollments in 2006.

Perhaps the most effective policy for low-income students in the United States would require not institutionally derived aid but, rather, increases in thus far inadequate federal grants and loans. Thus, elite public and private institutions might become within the grasp of a low-income student.

The US government needs to rethink and expand financial aid to low- and middle-income students as their numbers grow. The US Department of Education recently estimated that demand for Pell Grants exceeded projections by some 800,000 students; total applications for the grant program are up 16 percent over the previous year. Fortunately, as part of its economic stimulus plan the Obama administration is taking some steps in the right direction by proposing an additional $8 billion to be added to the Pell Grant's current budget of $19 billion.

Academic Performance

How do lower-income students perform academically and in other gauges of engagement when compared to more wealthy students? We explored this issue by using a unique data set that combines more than 57,000 responses from a spring 2006 Census survey of all undergraduates in nine UC campuses with institutional data.

On issues of affordability and access, foreign as well as many US observers of American higher education often fail to disaggregate its network of colleges and universities.

This survey is part of a larger Student Experience in the Research University Project and Consortium that we have developed with colleagues, including all the UC campuses, an initial group of six other universities of the Association of American Universities, and soon some international partners. The purpose is to develop new information on students to promote institutional self-improvement and scholarly exploration. Knowing more about the socioeconomic background of students and their experiences and academic performance is a major frontier not yet competently explored by most universities—in the United States and globally.

In our Poor and Rich study, we found that low-income ("poor") students at the University of California generally fare as well academically as high-income ("rich" with family income above $125,000) students. At the same time, three in every four Pell Grant recipients are either first- or second-generation immigrant students and one in every three has at least

one parent with a four-year college degree, suggesting the need to rethink the assumption that "low-income" students are also "first-generation college-going" (and vice versa).

At the same time, Pell Grant recipients at UC have only slightly lower GPAs than their wealthy counterparts; this is true in math, science, and engineering and in humanities and social science fields. Poor students at UC generally have the same levels of satisfaction with various aspects of their undergraduate experience (e.g., overall satisfaction and quality of advising received) and in their sense of belonging within a campus community as rich students.

We also found some small but intriguing differences across UC campuses with poor students less satisfied relative to their affluent peers at those campuses with smaller proportions of lower-income students. Having a "critical mass" of low-income students may be extremely important in retaining and boosting their academic performance, and therefore we might see different results among, for example, the Ivy League campuses.

Without an equivalent data source to the survey Student Experience in the Research University Project and Consortium at other US universities currently, we sense that the increased presence of immigrant groups and their relatively high academic performance will grow as a phenomenon across the nation, as well as in Europe and other relatively open societies that depend economically on in-migration.

We also think it relatively safe to say that, in the case of the United States, public institutions will remain the primary entry point for middle- and lower-income students. Indeed, there may be a further market shift in which demand increases significantly for public institutions in light of significant shifts in the economic status of families during the current economic crisis—that is, if public universities gain the funding to take on growing enrollment demand. ■

Regional Citation Indexes: A Global Research Priority

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In 1955, Eugene Garfield, the founder of the Institute for Scientific Information (ISI, now part of Thomson Reuters), introduced his ideas to create "citation indexes for science." Garfield addressed the use of cited references in a scholarly paper as descriptors of the "molecular unit of thought" of the author. The basic challenges of traditional subject-based indexes were, as he pointed out, that human indexers cannot anticipate the infinite number of possible scientific approaches each scientist may take and that those indexers were required to be familiar with the subject matter. Compared to human indexing, the recording of all cited references in a given paper is a mindless task. Therefore, it can overcome those challenges while maintaining the interlinking relationship of literature by making proper references from one to another. The citation index was proposed as an information retrieval tool to trace the development of a particular topic over time, through cited references.

Today, the Web of Science® database indexes more than 10,000 journals of natural and social sciences and the arts and humanities.

The first edition of the Science Citation Index was published in 1963 in five volumes with 102,000 source articles from 613 journals, and the cited references yielded 1.4 million items. As technology advanced, the citation index evolved from print format to microfiche, to compact disc, and to the Web database. Today, the Web of Science® database indexes more than 10,000 journals of natural and social sciences and the arts and humanities. Its depth of coverage has been expanded to cover the period from 1900 to the present. In 2008 alone it indexed more than 1.6 million records with 41 million cited references. Over 20 million users in 90 countries use Web of Science.

Citation Indexes for Quantitative Analysis

While the original motivation in creating citation indexes was to enhance the retrieval of scientific information, the inventor and his supporters foresaw more purposes—as monitoring the growth and structure of scientific activities or measuring the significance of someone's research indicated by citation impact. The ever-growing scale of scientific research, as well as its interdisciplinary nature, sometimes hampered objective and fair research assessment, even when done by a field expert.

Moreover, what was once considered as a time-consuming exercise—to capture a sizable body of scholarly literature and index all the cited references—turned out to be a cost-effective enterprise accelerated by the advancement of information technology and computing. The bibliometric study, where publication and citation counts are the basic units, became widely adopted to complement human judgment in assessing scientific research outcomes of countries, institutions, and researchers.