WHEN RECESSIONS AND RECOVERIES LEAVE THEIR STAMPS ON THE OVERALL ECONOMY, HIGHER EDUCATION NATURALLY is not immune. Public colleges and universities feel the impact of cyclical economic forces through the causal link between state coffers and higher education budgets. But even independent institutions, which are generally thought to be more resistant to external economic forces, are affected by both contracting and expanding cycles.

For example, the certainty of a job influences a family's perceptions about the affordability of attending an independent college. And fluctuations in stock and bond markets alter the value of endowments.

We know that recessions are likely to be bad and recoveries good for independent colleges, but we do not know how bad or how good. The purpose of my study was to bring some clarity to this issue by empirically measuring the impact of the economy on the independent sector. The results can help business officers gauge how best to respond to external economic cycles that have a significant impact on their institutions.

To measure the linkages between the economy and independent colleges, I used NACUBO’s 2001 Tuition Discounting Survey. The survey, which has been conducted every year since 1990, includes data such as undergraduate enrollments, tuition and fee levels, and institutional financial aid and scholarship grants. The sample size has grown over the years, but for purposes of this study, the relevant sample includes the 191 independent colleges and universities that provided complete responses to the survey from 1990 to 2001.

The average number of entering freshmen for these 191 institutions rose from 516 in fall 1990 to 600 in fall 2001 (see Figure 1). Only two years experienced declines in the average number of entering freshmen during that period. Those years coincided with the only two recessions between 1990 and 2001: the 1990-1991 recession and the 2001-2002 recession.
Total institutional grants for entering full-time freshmen also appear to have been influenced by these recessions. Following the drop in freshman enrollment during the 1990-1991 recession, the average level of freshman grants rose sharply from $1.6 million in 1991 to $2.2 million in 1992, an increase of 37.5 percent. After this spike, freshman grants leveled off in 1993 before beginning a steady rise through 2001 (see Figure 2).

Since the spike in freshman grants occurred a year after what appears to have been a recessionary dip in freshman enrollment, we might speculate that independent colleges and universities discounted more heavily in the face of declining demand. If such a causal relationship exists, the implications regarding enrollment and pricing decisions in the independent sector are significant.

**Equation Explains Changes**

To more accurately measure the relationship between factors such as tuition, financial aid, and external economic forces on enrollment, a multiple linear regression equation using transformed weighted least squares was estimated over the 1990-to-2001 period. The equation explains annual percentage changes in the number of entering full-time freshmen as a function of annual percentage changes in the following three independent variables: tuition and fees, freshman grants, and real GDP.

The empirical findings suggest that an increase (decrease) in tuition and fees leads to a decrease (increase) in freshman enrollment; an increase (decrease) in freshman grants leads to an increase (decrease) in freshman enrollment; and an increase (decrease) in real GDP leads to an increase (decrease) in freshman enrollment. All three explanatory variables—tuition, grants, and real GDP—were found to be significant at the 0.99 level, and the equation explains almost 50 percent of the variation in an institution’s freshman enrollment ($R^2 = 0.46$).

Since all the variables tested in the equation are in percentage change form, the estimated coefficients also represent elasticities. For example, the estimated coefficient of $-0.16$ for percentage changes in tuition and fees suggests that a 1.0 percent increase in tuition and fees will lead to a 0.16 percent decrease in freshman enrollment. The regression results also suggest that a 1.0 percent increase in freshman grants will lead to a 0.26 percent increase in freshman enrollment. Finally, the estimated coefficient for real GDP suggests that a 1.0 percent increase in real GDP will lead to a 0.61 percent increase in freshman enrollment.

**Isolating Each Variable**

While the estimated directions of causality are not surprising (i.e., higher tuition leads to lower enrollment; higher grants lead to higher enrollment; and higher real GDP leads to higher enrollment), the equation has the benefit of separating out the impact of each variable while holding all other explanatory variables constant. This is an advantage because institutions regularly increase tuition and fees, but we cannot typically observe the negative effects that tuition increases have on enrollment. Why? Other factors—such as freshman grants and real GDP—also change and drown out the negative impact of changes in tuition and fees on enrollment.

For the colleges and universities in this study, the average annual percentage increase in freshman enrollment from 1990 to 2001 was 1.38 percent. At the same time this was occurring, tuition, grants, and real GDP also were increasing.

The regression results make possible a disaggregation of the independent impacts of these variables. The negative impact of increasing tuition and fees on enrollment over the 1990 to 2001 period was more than offset by the positive impacts of higher freshman grants and real GDP growth. When the independent effects of all three independent variables are combined, the regression equation points to an estimated annual increase in freshman enrollment of 1.13 percent, very close to the actual average increase of 1.38 percent.
Effect on Freshman Enrollment

Using this equation, we can also quantify the impact of the 1990-1991 and 2001-2002 recessions on freshman enrollment levels. During our most recent recession, real GDP in 2001 increased at a significantly slower rate than the 4.2 percent growth in 2000. The equation suggests that this slower real GDP growth, holding everything else constant, led to a slower increase in enrollment growth.

But everything else was not constant. An increase in tuition and fees in 2001 led to a decline in enrollment. Offsetting that impact was an increase in freshman grants. The combined effects of these changes on freshman enrollment as estimated in the regression equation suggest an average enrollment drop of 0.97 percent in 2001, roughly approximating the actual decline of 0.29 percent.

The accuracy of the equation as a forecasting tool is reflected by the fact that it also correctly projected a drop in freshman enrollment in 1991, the only other academic year to coincide with a recessionary period.

Examining Pricing Strategies

We can use this equation to evaluate the efficacy of various pricing strategies. It appears, for example, that institutions not only overreacted but also reacted too late in responding to the drop in enrollment that occurred in fall 1991. Institutions sharply increased freshman grants in 1992, but by then, it was already too late.

Institutions may be inclined to increase tuition discounts for the fall 2002 term to help counteract the enrollment drop that occurred in 2001. However, since a recovery appears to be underway, an increase in freshman grants probably will be too late to do any good. Recovery forces already in place should lead to a return in enrollment growth without sharply increasing tuition discounting.

To illustrate how the results of this study can be used as a tool for making informed pricing decisions, we can examine the impact of various pricing assumptions on an average institution’s future enrollment levels.

First, in order for the equation to generate forecasts for freshman enrollment for the upcoming fall 2003 academic year, we must project real GDP growth and the rate of inflation for 2003. Forecasts of 4.0 percent growth for real GDP and 2.5 percent for inflation are in the mid-range of current economic projections for 2003. If we also assume that a particular college plans in its budget to increase tuition by 3.0 percent and freshman grants by 6.0 percent for the fall 2003 term, the equation suggests that freshman enrollment at the college will increase a little more than 1.0 percent.

A business officer’s enrollment target might be higher or lower than that projection. If, for example, the college’s enrollment target calls for 2.0 percent growth, then the tuition increase should be less than 3.0 percent and/or freshman grants should increase more than 6.0 percent. Using a combination of both, the equation projects roughly 2.0 percent growth in enrollment when tuition increases by 2.0 percent and grants increase by 8.0 percent.

If the economy generates higher or lower real GDP and inflationary growth than that used in the original projections, tuition discount strategies could be modified to help reach an institution’s enrollment targets. Stronger economic growth, in general, should lead to less discounting, while weaker growth should lead to more.

The empirical results of this study shed light on the impact of several variables on enrollment at independent colleges and universities. The results strongly suggest that the independent sector of higher education does not live in an ivory tower, somehow insulated from the tough competitive pressures of a cyclical economy. Quite the contrary, the evidence shows that economic cycles and pricing pressure have measurable and predictable effects on independent higher education.

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