TESTIMONY PREPARED FOR:

UNITED STATES SENATE
COMMITTEE ON GOVERNMENTAL AFFAIRS

HEARING ON "THE RISING COST OF COLLEGE TUITION
AND THE EFFECTIVENESS OF GOVERNMENT FINANCIAL AID

WEDNESDAY, FEBRUARY 9, 2000

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Higher Education is an Important Source of Economic Growth for the United States

There is widespread acceptance among economists that education is an important source of economic growth for the United States. Three types of evidence are particularly relevant. First, the relationship between the growth rates and education levels of countries suggests that, for every additional year of education attained by the average adult in the population, a country grows 1 percentage point faster per year.[1] Second, the United States has an international comparative advantage in producing goods and services that have a high skill content. That is, industries that generate net exports for the United States (and in which our net exports are growing most quickly) are industries that use a disproportionately high amount of educated labor.[2] Third, high technology industries demand labor that is very highly educated–that is, workers who not only have a college degree, but who have full mastery of advanced, college-level analytic skills. It is unlikely that high technology industries will continue to grow at their current pace if the wage they must pay to workers with these skills rises significantly. The United States will need the share of its new workers who have such an education to nearly double (from approximately 7 to approximately 14 percent of new workers) by 2010 if the growth of high technology industries is not to be reined in by rising wages.[3]

Why Have Colleges Changed and Why Has Tuition Risen at Some Colleges?

There are three forces that are primarily responsible for the changes in colleges and in tuition.

First, skill-intensive technological growth has increased the demand for *high intensity* college education in the American labor market. By *high intensity*, I refer to college education in which students are expected to master large quantities of difficult material in each year of college. In order to engage in getting a high intensity college education, a high school graduate must have very full mastery of high school material. In a high intensity college education, students are typically required to interact with technology, such as computers, in a sophisticated way. They are required to develop advanced analytic and communications skills. People who have obtained high intensity education are disproportionately in demand in America's highest growth industries. Students who have obtained a high intensity college education are nearly 400 percent overrepresented among the workers in the 10 highest growth (SIC 3-digit) industries in the United States.[4]

Second, prospective college students are more mobile and informed now than they were 30 years ago. They know much more about their own college preparation relative to the national pool of high school graduates. It is easier for them to learn about colleges and financial aid. As a result, colleges now face a more competitive market than ever before because students compare colleges with similar offerings and are sensitive to tuition differences among them. More than ever before, students avoid colleges that charge tuition that is higher than those of other colleges with similar offerings. Also, colleges have become *vertically specialized* and *horizontally specialized*. An example of vertical specialization is a college that now specializes in producing high intensity college education; 30 years ago, a small share of its students might have obtained a high intensity education but the majority would have pursued less demanding courses. An example of horizontal specialization is a college that now specializes in educating full-time workers using cooperative programs with local employers.[5]
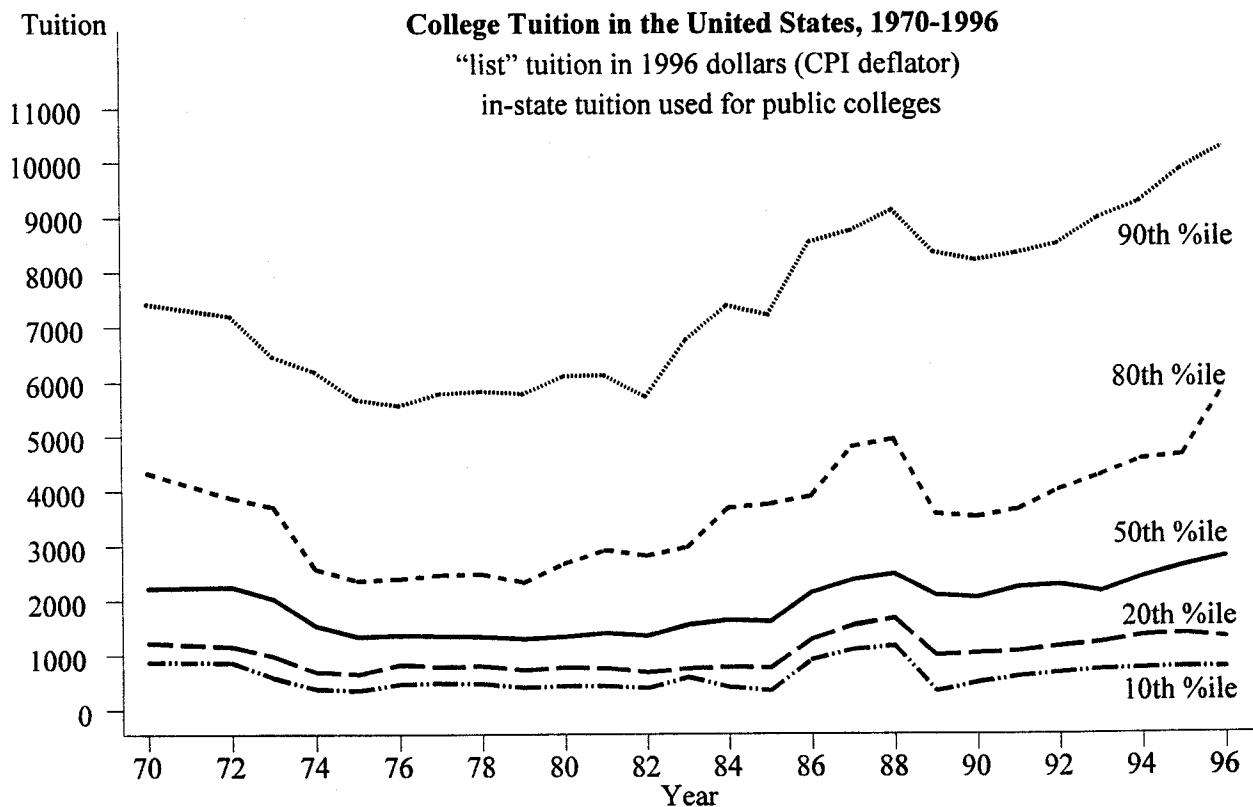
Third, international trade and technological innovation have decreased the demand for

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low-skilled labor in the United States.[6] As a result, prospective college students who are poorly prepared for standard college education–in the sense that they did *not* master high school material–have an increased incentive to get some amount of post-secondary education, starting perhaps with remedial courses. That is, in addition to the rising demand for high intensity college education, there is rising demand for years of college education.

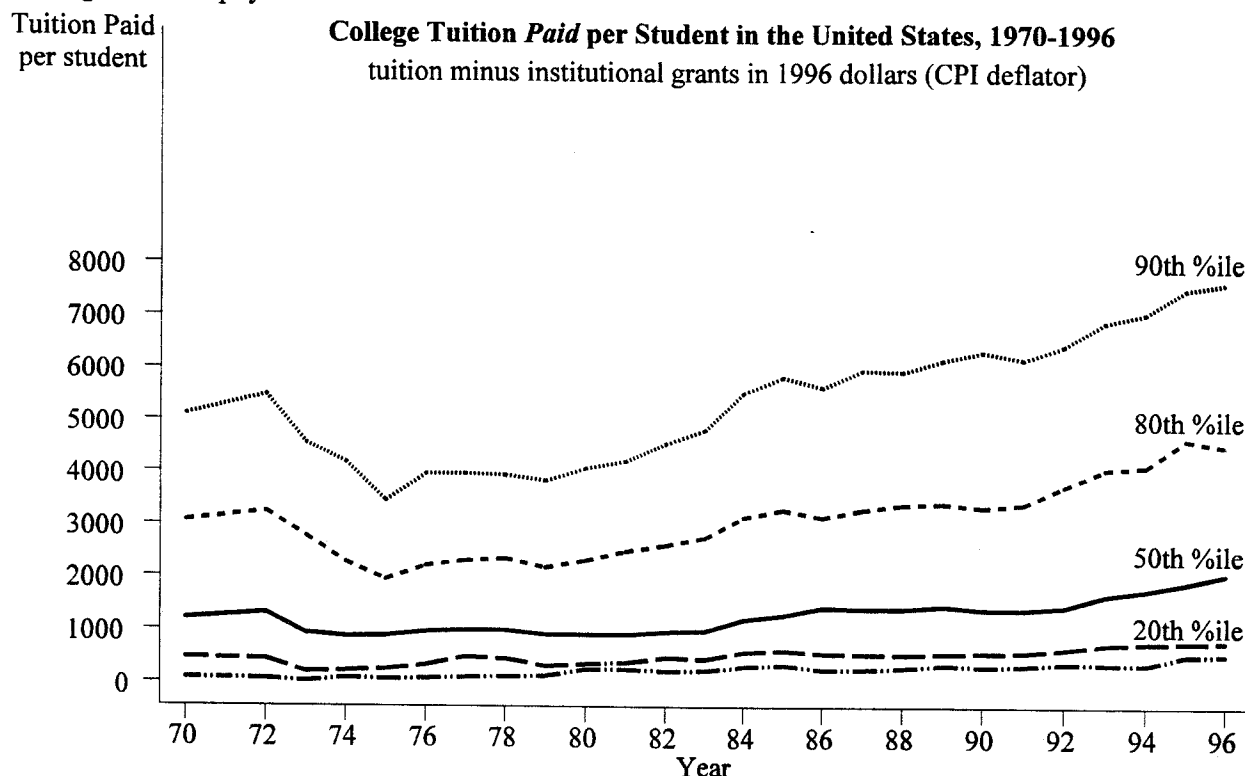The Effects of these Forces on College Tuition

The three forces just described have caused the college sector to grow, have caused colleges to become more specialized, and have caused educational intensity to rise in colleges that have specialized in this high intensity education. The college sector has become much more diverse, in order to accommodate the needs of both poorly prepared high school graduates who want education akin to high school education and highly prepared students who want high intensity college. Because of this increased diversity, tuition is more *diverse*.

College tuition has risen, but it has not risen across the board. In fact, since 1970, tuition has remained almost flat in real terms for fully 50 percent of the college places in the United States. The figure below shows how college tuition in real dollars has changed since 1970.[7] Tuition has declined about 15 percent for the 10 percent of college places that are least expensive. Tuition has held steady at the 20th percentile and increased only modestly at the 50th percentile. Tuition has risen significantly only at and above the 80th percentile–that is, only for the 20 percent of college places that are most expensive.

College Tuition in the United States, 1970-1996
"list" tuition in 1996 dollars (CPI deflator)
in-state tuition used for public colleges

Furthermore, looking at "list" tuition (as shown in the figure above) is somewhat misleading because the colleges that have raised their tuition the most also give the largest grants

to students. The figure below shows how tuition *paid* per student has changed since 1970.[8] It shows that tuition paid has also remained nearly flat for the least expensive 50 percent of college places in the United States. It also shows that "list" tuition exaggerates the amount of tuition the average student pays.

Tuition Paid per student

College Tuition *Paid* per Student in the United States, 1970-1996
tuition minus institutional grants in 1996 dollars (CPI deflator)

Year

The least expensive 50 percent of colleges in the United States are appropriate points of entry for students who are poorly prepared for college. They should not make a large initial investment because college education is a risky investment for them, given their poor preparation. It makes sense for them to enroll in less expensive courses until they have the skills to succeed in a tougher college environment.

Tuition *has* risen in real terms for the most expensive 20 percent of college places. These are the colleges, however, that have increasingly specialized in providing high intensity education. They increasingly provide students with technology, highly skilled faculty (who are in demand by high growth industries), and other resources needed for high intensity education. Their costs and tuition have risen accordingly. This does not imply that their tuition is not priced competitively. Indeed, this sector of the college market is the most competitive because the relevant students are the most mobile and the most informed about their college choices. Such students are the *most* sensitive to colleges' tuition and offerings because they have the greatest ability to choose among colleges. Moreover, estimates suggest that the highest return to a dollar of tuition is provided by American colleges that are charge tuition above the 50th percentile.[9] Also, foreign students from all over the world are drawn to these colleges, believing that they provide better return per tuition dollar than colleges in their home countries or in other potential host countries.[10]

Much of the upset over rising college tuition is caused by the fact that commentators

focus almost exclusively on the tuition charged for the 10 percent of college places in the United States that are most expensive. While these colleges may be of interest to them personally, good analysis requires a more comprehensive view. Consider a entirely different market, fabrics say, to see how misleading it can be to focus only on the maximum price. The same fabrics that were available to our ancestors are available today, at a similar or lower price. But research has led to the introduction of specialty fabrics that perform much better under some conditions–think of the fabrics now used for athletic clothing. These specialty fabrics are naturally more expensive because they cost more to produce. If one were to study fabric prices by looking only at the most expensive fabrics every year, one would mistakenly conclude that fabric was becoming too expensive for fabricgoods manufacturing. Competition in the fabric market keeps prices in line with costs; it does not prevent high performance fabrics from being introduced at competitive prices.

Has Tuition Made College Inaccessible?

In order to see whether tuition has made college (or some colleges) less accessible, I analyzed data from two comparable, nationally representative surveys produced by the United States Department of Education. I compared 1972 and 1992 high school graduates, in order to see how their college choices differed. The analysis is shown in the table below.[11]

Let us first consider high school graduates who are very well prepared for college. In 1972, a student in the "high college preparedness" group (typically, SAT scores of 600 or above and class rank in the top quarter of his class) whose family income was very low (less than $20,000 in 1996 dollars) had a 6 percent probability of not going to college at all and a 33 percent probability of going to one of the 10 percent most expensive colleges in the United States. In 1992, the same student had a 0 percent probability of not going to college at all and a 43 percent probability of going to one of the 10 percent most expensive colleges. Clearly, access to college generally and access to expensive colleges in particular increased for highly prepared students from very low income families. In fact, access to college and access to expensive colleges increased substantially for highly prepared and medium-highly prepared students from families of all incomes. For instance, among students whose family income was medium-low (between $20,000 and $35,000), a "medium-highly prepared" student (typically, SAT scores between 500 and 600 and class rank in the upper third of his class) had an 11 percent probability of attending one of the 10 percent most expensive colleges in 1972, but had a 23 percent probability of doing so in 1992.

Second, let us consider high school graduates who are moderately prepared for college. In the table, a typical student with medium-low college preparedness had SAT scores between 400 and 500 and class rank in the upper half of his class. Among such students, the percentage who do not go on to college fell sharply between 1972 and 1992. For instance, in 1972, 38 percent of medium-low prepared students who came from very low income families did not go on to college; in 1992, only 22 percent of such students did not go on to college. Students with medium-low preparedness not only increasingly attend college, but most of the increase in their attendance is at colleges that charge about median tuition. Thus, there is no evidence that appropriate colleges are less accessible to students in this key group, who are likely to succeed in college, but are unlikely to want to pursue an intensive college education.

Finally, let us consider high school graduates who are poorly prepared for college. In the

table, a typical student with very low college preparedness had SAT scores below 300. Even among such such students, the percentage who do not go on to college fell between 1972 and 1992. For instance, in 1972, 76 percent of students with very low preparation from families with income between $20,000 and $35,000 did not go to to college; in 1992, only 67 percent of such students did not go to college. Most of the increase in the attendance of students with very low preparedness is at colleges that charge low to medium-low tuition.

Conclusions

In short, we see that college is not less accessible to students now than it was 30 years; it is significantly more accessible. Moreover, there is no evidence that students are being forced to enroll in inexpensive colleges that are inappropriate for their level of preparedness. In fact, the main group of students who appear to be getting displaced from very expensive colleges is the group of students from medium-high to high income families who have low college preparedness. They are being replaced by highly prepared students from low income families.

Since most of the increase in tuition affects only the most expensive colleges in the United States, would it be advisable to intervene at these colleges? Probably not, for a few reasons. First, they are increasingly accessible to highly prepared students from low income backgrounds. Second, they are changing their educational services most rapidly to keep pace with the demand for workers with high intensity college education. While we cannot be *sure* that such workers will be crucial to the future economic growth of the United States, such workers are certainly disproportionately employed by high growth industries now. Third, it is a basic tenet of economics that an economist should identify a market failure before he suggests intervention. Although economists are in widespread agreement that market failures exist related to borrowing for a college education (aid and loan programs are justified on this basis), there is no critical mass of economists who have identified market failures related to competition among colleges. Indeed, serious economists who study the market for higher education accept the fact that colleges have to compete *more* now than in the past– that is, they have less market power.

1972 High School Graduates

% who attend the following type of college within 28 months of high school graduation

family income	college preparedness	no college	lowest tuition	low tuition	medium low tuition	medium high tuition	high tuition	highest tuition
family income ≤ $20,000	very low	74	5	5	10	3	3	1
	low	56	5	7	16	6	6	3
	medium-low	38	6	9	20	11	7	9
	medium-high	17	3	9	27	24	7	14
	high	6	6	0	11	22	22	33
family income > $20,000 & ≤$35,000	very low	76	4	5	7	4	2	1
	low	57	5	5	15	9	5	4
	medium-low	37	3	7	21	16	10	7
	medium-high	22	6	6	25	20	10	11
	high	13	3	3	17	26	15	23
family income > $35,000 & ≤$50,000	very low	71	5	5	8	5	4	1
	low	50	5	8	17	10	6	4
	medium-low	29	6	8	24	18	8	8
	medium-high	16	3	6	21	26	11	17
	high	4	1	3	17	27	15	33
family income > $50,000 & ≤$95,000	very low	66	4	9	9	6	5	1
	low	42	7	9	18	12	7	5
	medium-low	19	6	5	29	20	8	14
	medium-high	10	3	6	31	24	9	17
	high	3	1	1	18	29	13	34
family income > $95,000	very low	53	5	8	17	7	5	5
	low	30	6	7	22	15	7	13
	medium-low	15	4	7	24	22	9	19
	medium-high	5	2	5	26	22	13	28
	high	4	2	1	11	21	13	48

1992 High School Graduates

% who attend the following type of college within 28 months of high school graduation

family income	college preparedness	no college	lowest tuition	low tuition	medium low tuition	medium high tuition	high tuition	highest tuition
family income ≤ $20,000	very low	72	4	7	8	3	3	1
	low	48	6	12	17	8	7	3
	medium-low	22	5	12	27	17	10	7
	medium-high	13	3	7	20	25	13	20
	high	0	0	0	0	31	26	43
family income > $20,000 & ≤$35,000	very low	67	6	10	10	4	3	1
	low	41	7	14	20	11	4	3
	medium-low	20	4	10	32	20	8	7
	medium-high	7	2	7	27	20	14	23
	high	0	0	8	20	27	16	29
family income > $35,000 & ≤$50,000	very low	59	4	10	14	7	6	1
	low	33	5	14	23	14	8	3
	medium-low	18	4	11	29	22	8	8
	medium-high	8	1	5	28	26	14	18
	high	0	0	3	15	29	17	36
family income > $50,000 & ≤$95,000	very low	50	7	12	18	8	4	1
	low	24	6	16	26	15	9	4
	medium-low	12	6	11	26	25	9	12
	medium-high	4	2	5	27	25	11	25
	high	0	2	3	14	25	16	41
family income > $95,000	very low	37	0	9	28	21	4	1
	low	13	3	9	33	28	8	6
	medium-low	4	3	6	29	31	11	16
	medium-high	3	1	2	17	14	11	52
	high	0	0	0	12	19	13	57

See next page for additional notes.

Additional Notes for Table

Colleges are classified according to their tuition *in 1996*, so that if a college has become less accessible since 1972 because of its tuition, a smaller percentage of low income students will attend it in 1992 than in 1972. A college with "very low" tuition has tuition that is less than the 10th percentile of tuition charged in the United States. A college with "low" tuition has tuition that is greater than the 10th percentile but less than the 20th percentile of tuition charged in the United States. A college with "medium-low" tuition has tuition that is greater than the 20th percentile but less than the 50th percentile of tuition charged in the United States. A college with "medium-high" tuition has tuition that is greater than the 50th percentile but less than the 80th percentile of tuition charged in the United States. A college with "high" tuition has tuition that is greater than the 80th percentile but less than the 90th percentile of tuition charged in the United States. A college with "very high" tuition has tuition that is greater than the 90th percentile of tuition charged in the United States. Note that, in order to form tuition percentiles, it is necessary to weight colleges by their enrollment. Otherwise, extremely small colleges would count as much as large state universities, and the calculations would misrepresent opportunities available to high school students.

A student with "high" college preparedness has SATI verbal and math scores that exceed 600 (average of the two tests) and is the top 25 percent of his high school class. A student with "medium high" college preparedness has SATI verbal and math scores between 500 and 600 (average of the two tests) and is in the top 33 percent of his high school class (also, students with scores above 600 and low class rank are in this category). A student with "medium-low" college preparedness has SATI verbal and math scores between 400 and 500 (average of the two tests) and is in the top 50 percent of his high school class (also, students with scores between 500 and 600 and low class rank are in this category). A student with "low" college preparedness has SATI verbal and math scores between 300 and 400 (average of the two tests) and is in the top 67 percent of his high school class (also, students with scores between 400 and 500 and low class rank are in this category). A student with "very low" college preparedness has SATI verbal and math scores of less than 300 (the average of the two tests).

Endnotes for Text

1. Source: Robert J. Barro, "Determinants of Economic Growth: A Cross-Country Empirical Study," Lionel Robbins Lectures. Cambridge and London: MIT Press, 1997.

2. Source: Lars Lundber and Par Wiker, "Skilled Labour and International Specialisation in OECD Countries," *International Review of Applied Economics*, Vol. 11.3 (September, 1997), pp. 369-85.

3. Source: Growth rates come from employment series for 25-34 year-olds for occupations from specialized professions through executives, by 3-digit industry, from the 1982 to 1999 Current Population Surveys. Share of college graduates with a high intensity education estimated based on the college preparedness and achievement in college of students in the Beginning Postsecondary Student survey and its longitudinal follow-ups.

4. That is, they are represented at four times their general availability in the civilian labor force. Source: National Longitudinal Survey of Youth, 1979-1998.

5. Additional evidence on these trends is given by Caroline M. Hoxby, "The Changing Market Structure of United States Higher Education" and "How the Changing Market Structure of College Education Explains Tuition," available from the author (choxby@harvard.edu).

6. Source: David Autor, Lawrence Katz, and Alan Krueger, "Computing Inequality: Have Computers Changed the Labor Market? *The Quarterly Journal of Economics*, Vol. 113 .4 (November, 1998), pp. 1169-1213. George Borjas, Richard Freeman, Lawrence Katz, "How Much Do Immigration and Trade Affect Labor Market Outcomes? *Brookings Papers on Economic Activity*, Vol. 0.1 (1997), pp. 1-67.

7. Sources for the figure: WebCaspar, which compiles statistics on American institutions of higher education from the Higher Education General Information Surveys and the Integrated Postsecondary Education Data System. All three sources are supported by the National Center for Education Statistics, United States Department of Education. In order to calculate the percentiles, a college's undergraduate tuition is weighted by its lower division enrollment so that small colleges are not overrepresented.

8. Sources for the figure: same as the sources for the previous figure. In order to calculate the percentiles, a college's tuition paid per student is weighted by its lower division enrollment so that small colleges are not overrepresented.

9. Source: Caroline M. Hoxby, "The Return to Attending a More Selective College," available from the author (choxby@harvard.edu).

10. Source: Institute for International Education, *Open Doors*, 1997-98 edition. New York: IIE Press, 1999.

11. Sources for the table: National Longitudinal Survey of the Class of 1972 (1972 high school graduates) and National Educational Longitudinal Survey (1992 high school graduates). Both surveys are supported by the National Center for Education Statistics, United States Department of Education. See the notes that follow the table for details on how the calculations are made.