

Discussion Paper No. 20

Williams Project on the Economics of Higher Education
Williams College
Denison Gatehouse
Williamstown, MA 01267

Projections of College Costs,
Affordability, and Tuition Dependency
at COFHE and Other Institutions:
1990-2010

Morton Owen Schapiro
Michael S. McPherson

March 1993
DP-20

© 1992 - Morton Owen Schapiro and Michael S. McPherson

Note: This paper is intended for private circulation and should not be quoted or referred to in publication without the permission of the authors.

Projections of College Costs, Affordability, and Tuition
Dependency at COFHE and Other Institutions: 1990-2010

Morton Owen Schapiro
University of Southern California

Michael S. McPherson
Williams College

Consortium on Financing Higher Education
August 1992

Principal Findings

The affordability for families (“income burden” -- tuition costs in relation to income) and tuition dependency for institutions (tuition as a percentage of budgets) are projected for an education at a COFHE institution and at private and public four-year institutions in general. Annual projections of these data are given through the year 20, as well as figures for 2005 and 2010. The projections are based on a set of conditions that existed in 1989 and on recent trends (1979 - 1989).

These conditions and trends include:

- the costs per student of providing an education at COFHE schools are 2.7 times the level at all four-year privates, and 4.0 times the level at four-year publics
- non-tuition educational revenues at COFHE schools are 4 times higher than at private institutions, and are 3.5 times higher than at public institutions
- costs of attendance (without aid) are 43% higher at COFHE schools than at private institutions in general, and over three times higher than at publics
- the median income of both aided and non-aided students at COFHE institutions is substantially higher than that of students at other private and public institutions
- real increases in educational costs and non-tuition educational revenues were much faster at COFHE and private institutions than at public institutions
- institutional aid increased at a remarkable rate at all three types of institutions; private schools led the way with a 6.5% growth rate from 1979-1989
- the income burden for the families of aided students is similar at public and COFHE institutions, but is substantially higher at private institutions in general
- the income burden for non-aided students is almost twice as large at COFHE and private institutions than at public institutions

The forecasts indicated that if recent trends and current policies remain unchanged:

- costs of attendance will increase at all three types of institutions, most substantially at privates, and least at publics
- the net price for aided students will fall in real terms at COFHE and public institutions, but will remain stable among private institutions in general

- the income burden for families of non-aided students will remain stable at public schools, but will increase considerably at private and COFHE institutions; the gap in income burden for non-aided students between public and private schools will grow
- the income burden for aided students will fall at all three types of schools, most dramatically at COFHE institutions because of increases in aid budgets
- the dependence of institutional budgets on tuition will increase at public and private institutions and will slightly fall at COFHE institutions

Forecasts were also developed for alternative rates of change in three different variables; they showed that:

- future federal financial aid policy has a significant impact on affordability —at COFHE schools, the baseline income burden projection for aided students would decrease from 18% to 10% from 1990 to 2010; a decline in federal aid would result in a 17% income burden, while rapid growth would result in an 11% income burden
 - a strong economy would decrease the income burden for non-aided students at COFHE schools from 20% to 11%, while a weak economy would more than double the income burden for both aided and non-aided students
- high growth in institutional costs leads to an increase in income burden for both aided and non-aided students regardless of the growth rate of institution-based aid
- low growth in costs decreases the income burden for both aided and non-aided COFHE students regardless of the growth rate of institution-based aid
- COFHE tuition dependency increases with both a weak economy and high cost growth, and decreases with a strong economy and low cost growth

The final conclusions are that:

- the economy plays a dominant role in determining the future affordability of higher education
- the rate of growth in costs has a much larger effect on future affordability than does the growth rate of institution-based aid; therefore, institutions need to stop the current trend of high growth rates of costs
- since a continued strong economy seems unlikely, institutions will need to concentrate on controlling costs

I. Introduction

The purpose of this paper is to consider how “affordable” an education at COFHE institutions is likely to be in the next 20 years.¹ We do this by developing a series of forecasts for key cost ratios for four-year institutions of higher education – public, private, and COFHE institutions as a subset of the latter. We also examine the possible effects on families and on institutions of particular institutional costs and sources of revenue by altering our assumptions regarding their rates of increase. “Affordability” is assessed by comparing educational costs for students who have financial aid, and for those who do not, in relation to income measures for their respective families. The effects on institutions are assessed by examining their dependence on tuition revenues. By identifying key variables and considering factors that are likely to influence them, we can offer some judgments about which of these forecasts are more likely to be realized and how policies and practices within COFHE schools could influence costs and prices.

In presenting simulations of future college prices, student aid, and family income, we emphasize the multiple interdependencies among the variables to be forecast. Inflation plainly affects both families’ incomes and college costs; trends in economic growth affect incomes as well as the ability and willingness of governments to subsidize higher education. Trends in institutional costs, non-tuition educational revenues, and student aid from federal and other sources all affect trends in future net prices. We have developed simple models elucidating these relationships which help us to identify the crucial variables that are likely to influence the future affordability of college.

Section II describes the simulation model and presents the projection results. In it we explore projections of the price of attending college and the relationship between prices and family income—that is, affordability. We also examine the degree to which institutions are dependent on tuition income. Section III focuses on concerns about future affordability that are implied by our simulation results and concludes.

II. Model and Results

Our simulation model works from initial conditions that we set based on recent levels and rates of growth in a variety of key variables. Any simulation model has imbedded in it certain relationships among the variables and we have tried to create a model that is simple yet captures the main forces at work.

In formulating a model of cost determination, we work from the following accounting model: institutions¹ educational costs (educational and general expenditures) per student equal the sum of tuition revenues (gross of student aid) per student and non-tuition educational revenues per student.² We then project educational costs and non-tuition educational revenues separately, and therefore calculate tuition charges as the residual that is required to balance the budget. Our model assumes that “costs of attendance” (from the student’s point of view) are equal to the sum of living costs (which we assume will

¹This paper will adhere to the standard assumption in the U.S. that parents are assumed to have a responsibility to contribute to the costs of the education of their children of traditional college age. Our focus throughout is on full-time attendance by students of traditional college age, the status of almost all COFHE students.

²This assumes that current revenues equal current expenditures and that auxiliary enterprises break even.

stay constant in real terms³) and gross tuition charges (obtained from the residual calculation mentioned above). We project separately per-student values for federal student aid grants, other student aid grants, and loans, and we use these projected values in the calculation of costs to families net of grants and with the subsidy value of loans set at one-half the award amount.⁴

In developing our projections, we establish different initial conditions and growth rates for each of three post-secondary education groups: the COFHE schools, public 4-year colleges and universities, and all private 4-year colleges and universities. COFHE institutions are included in the latter, but they constitute less than 3% of the institutions. In calculating living costs, all students are considered to be in residence. Thus, room, board and transportation costs are included in living costs. In addition, we examine costs separately for aided and non-aided students.

For comparative purposes we project family incomes for students at these three categories of institutions, with initial conditions in each sector set equal to the inflation-adjusted median income of families of freshman students attending that institutional type in a recent year. In our projections we track (1) the ratio of net price to family income for aided and for non-aided students, and (2) the ratio of gross tuition to educational costs. This allows us to forecast two key variables – the burden borne by families and the degree of tuition dependency in institutional budgets.

Data Sources

We used a variety of data sources in setting the initial conditions for each variable described above. We relied primarily on data from the Department of Education's HEGIS and IPEDS files and supplemented this information with data found in the College Board's Annual Survey of Colleges (College Board (1988)), Trends in Student Aid (Lewis (1988)), and College Cost Book (College Board (1989)), along with income information from the American Freshman Survey. All values were adjusted to correspond to the 1989-90 academic year. For COFHE institutions, we also used data from the Freshman Financial Aid/Admissions Survey (January 1990).

Forecast Methods

We establish a baseline for real rates of growth in each of our variables using data from the 1978-79 to 1988-89 period.⁵ All variables are expressed on a per-full-time-equivalent enrollment basis. A baseline scenario for the period 1990 (referring to the academic year 1989-90) to 2010 (referring to the academic year 2009-10) is computed simply by applying the growth rates from 1978-79 to 1988-89 to

³This is an assumption that implies that no improvements in the quality of living conditions at institutions of higher education will occur beyond general increases in the standard of living in the economy at large. Competition for students could render this assumption invalid, however, thereby causing our projections to underestimate total costs of attendance.

⁴The estimate that the subsidy value of loans is half the face value is roughly consistent with findings reported by Bosworth *et al.* (1987) and Hauptman (1985).

⁵The choice of a baseline period for establishing historical values is somewhat arbitrary. The endpoint of the period is dictated by availability of financial data -- the academic year 1988-89 is the latest for which aggregate data are available. We chose the starting point to provide a period of adequate length which would capture the years during which rapid growth in college costs became an important phenomenon.

each of our variables and stepping the calculation forward one year at a time. It is important to note that our baseline scenario assumes a continuation of the recent past, rather than representing our “best guess” of the future. This recent period is of special interest because it has involved exceptionally high rates of growth in real tuition charges. If we were to try to establish such a “best guess” formulation, it would most plausibly be based on a considerably longer time period and would also attempt to anticipate any structural changes that would make the future different from the past. Alternative scenarios discussed below examine the consequences of various divergences from these recent growth rates.

We report annual results through 2000, and the years 2005 and 2010. Obviously, point forecasts for 2010 should not be taken seriously as **predictions**. **The** purpose of extending the projection period is to make trend differences more apparent.

Initial (1988/89) Conditions

Table 1 gives the initial conditions and recent growth rates that underlie our projection. These initial conditions, from which our projections are then developed, show that educational costs (educational and general costs per student) at COFHE schools (\$47,400) are 2.7 times the level at all four-year privates (\$17,900) and 4.0 times the level at four-year publics (\$12,000). Living costs vary somewhat across groups, with the cost for COFHE students (\$4,800) above the average cost at all four-year privates (\$3,800) and four-year publics (\$3,500).

The variation in non-tuition educational revenues (per-student revenues from sources other than gross tuition) is considerable.⁶ These revenues are about 4 times as high at COFHE schools (\$33,000) as at all private institutions (\$8,300) and are 3.5 times as high at COFHE schools as at public institutions (\$9,500). Costs of attendance (the sum of educational costs and living costs, less non-tuition educational revenues) are about 43% higher at COFHE schools (\$19,200) than at all privates (\$13,400) and are 3.2 times as high as at public institutions (\$6,000). Pell awards are lowest at COFHE schools (with an average value of \$386 among students who receive aid) while loans are highest at COFHE schools (averaging \$3,409 among aided students). Public schools, on the other hand, have the highest Pell awards (\$809) and the smallest loans (\$1,362). For students attending private schools, Pell awards average \$508 and loans average \$1,785. Other grants (institutional aid) at private four-year colleges provide a significant amount of additional support (averaging \$3,231 among aided students), especially at COFHE schools (\$9,318). Other grants make a much more modest contribution at public schools (\$894).

The income data indicate substantial differences in the backgrounds of students at COFHE and other institutions. The median income of aided students at COFHE schools is in the neighborhood of \$43,000, far greater than at all privates (\$26,000) and publics (\$19,000).⁷ Median income of non-aided students varies from \$95,000 at COFHE to \$71,000 at all privates and \$56,000 at the publics.

⁶Note that student aid revenues are not included here -- they are treated as revenues from students and accounted for separately.

⁷The data on income are more tenuous than the other numbers given the difficulty of collecting information on family income for non-aided students. We rely here on American Freshman Survey data that are discussed in much greater detail in Schapiro, O'Malley and Litten (1990).

Table 1: Projections of college costs and affordability: Levels and Growth Rates

	COFHE	Public	Private
INITIAL LEVELS			
Educational costs (E&G per student)	\$47,400	\$12,000	\$17,900
Living costs	\$4,800	\$3,500	\$3,800
Non-tuition educational revenues	\$33,000	\$9,500	\$8,300
Costs of attendance ¹	\$19,200	\$6,000	\$13,400
Pell grants ²	\$386	\$809	\$508
Loans ³	\$3,409	\$1,362	\$1,785
Other grants (institutional aid) ⁴	\$9,318	\$894	\$3,231
Family income -- aided students	\$43,000	\$19,000	\$26,000
Family income -- non-aided students	\$95,000	\$56,000	\$71,000

GROWTH RATES (percentages)

Educational costs (E&G per student)	3.4	1.6	3.2
Living costs	0	0	0
Non-tuition educational revenues	3.5	1.2	2.8
Pell grants	0	2.7	0
Loans	5.0	3.0	5.0
Other grants (institutional aid)	4.2	3.8	6.5
Family income -- aided students	1.2	1.2	.6
Family income -- non-aided students	1.2	1.2	.6

1. Costs of attendance equal the sum of educational costs and living costs, less non-tuition educational revenues.
2. These amounts represent the average Pell award received by aided students. The percentage of students on aid equals 44% at COFHE schools, 47% at Public, and 65% at Private. The average Pell award for all students equals \$170 at COFHE schools, \$380 at Public, and \$330 at Private.
3. As explained in the text, in calculating net price, the subsidy value of the loan amount presented here is computed at 50% . These amounts represent the average loan received by aided students. The average loan for all students equals \$1,500 at COFHE schools, \$640 at Public, and \$1,160 at Private.
4. These amounts represent the average amount of institutional aid received by aided students. The average award for all students equals \$4,100 at COFHE schools, \$420 at Public, and \$2,100 at Private.

Recent Trends

Table 1 also shows the growth rates in our variables over the period 1978-79 to 1988-89. Some interesting variation in these rates exists across institutional types. While there were real increases in educational costs in each of the three sets of institutions, the annual real increase was much faster at COFHE schools (3.4%) and at all private 4-year institutions (3.2%) than at public 4-year schools (1.6%). As noted earlier, we have assumed that living costs remain stable in real terms. Non-tuition educational revenues show a pattern similar to educational costs, with increases at COFHE schools (3.5%) and at all privates (2.8%) well above the increase at public institutions (1.2%).⁸ On the other hand, the real rate of growth in Pell support per student was substantial at public institutions (2.7%) while the real value of Pell grants remained stable at private colleges and universities. Loans, however, increased at a rapid rate at private schools (5.0% annually), while increasing at a slower rate (3.0%) in the public sector. Institutional aid (other grants) increased at a remarkable real rate of 6.5% at all private schools, 4.2% at COFHE schools, and 3.8% at public schools. Lastly, over this period there was some real growth in the median income of families with students attending COFHE schools and public schools (1.2%), although the growth rate at private schools was quite small (0.6%).⁹

The Baseline Scenario

Forecasts using the baseline rates provide a reasonable picture of the future if these rates were to persist over the next two decades. Projections of our key cost data and ratios are presented in Figures 1 to 3 with separate graphs for non-aided and aided students. Tables A-1 (Non-aided students) and A-2 (Aided students) in the appendix contain the figures on which the graphs are based.

Figure 1-A shows that at public 4-year institutions, costs of attendance would increase from \$6,000 in 1990 to \$7,924 in 2010 (in 1989-90 dollars). For aided students, however, the net price falls slightly in real terms, from \$3,617 in 1990 to \$3,433 in 2010 (Figure 1.B). Figure 2.A indicates that the burden borne by the parents of non-aided students would remain stable over the period as the ratio of net price to income remains at 11%, reflecting the similarity in growth rates between tuition and income. For aided students, the income burden falls from 19% to 14%, as the relatively rapid growth in financial aid lowers the proportion of income needed to pay for a public sector education (Figure 2.B). Finally, tuition dependency in the public sector increases from 21% in 1990 to 27% in 2010 (Figure 3).

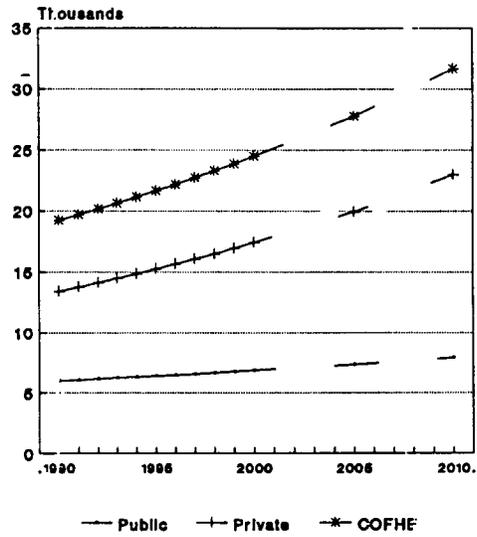
The forecast for all private four-year institutions shows the same general pattern as in the public sector. Costs of attendance rise from \$13,400 to \$22,989. The net price for aided students remains at roughly \$8,750. As in the public projection, the income burden for aided students falls (from 34% to 30%), as financial aid growth more than compensates for the relatively small rate of increase in income. However, while the income burden for non-aided students at public colleges was stable, the income burden for non-aided students at private colleges increases considerably over the period, from 19% to 29%. There is a modest increase in tuition dependency at four-year privates from 54% to 57%.

⁸For private institutions, the main such revenue source is gifts and endowment earnings. For public institutions, it is state subsidies.

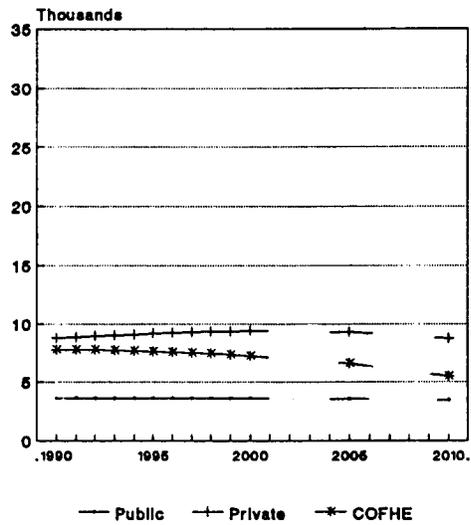
⁹ We assume below that the rate of growth in income is the same for aided and non-aided students.

Figure 1: Projected College Costs

A. Non-Aided Students

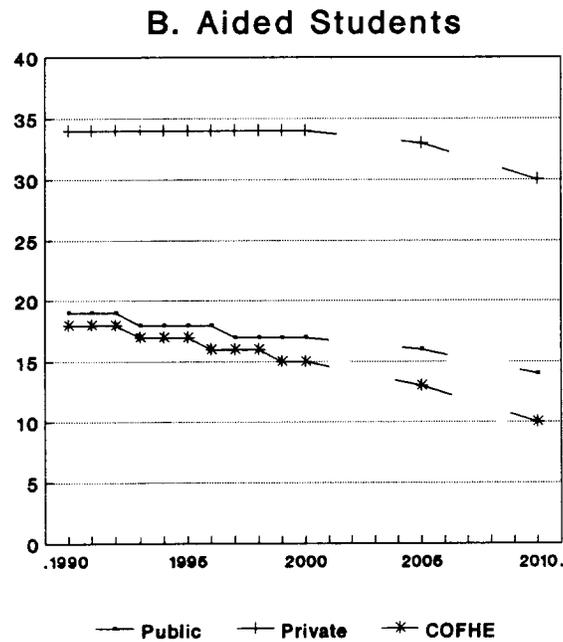
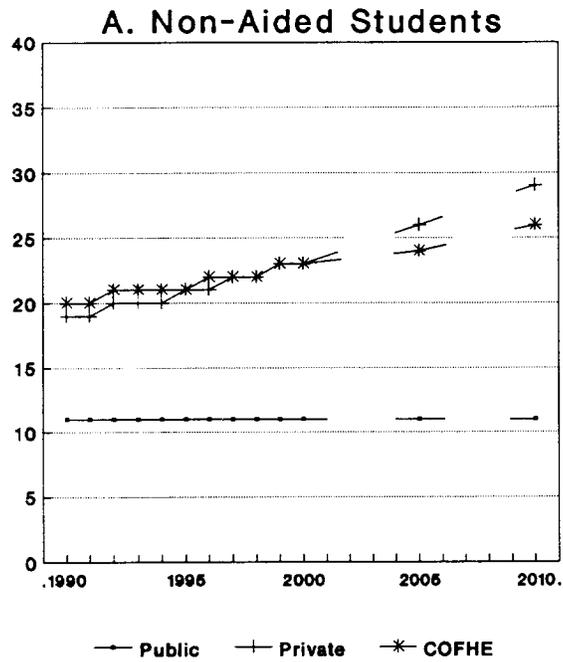


B. Aided Students



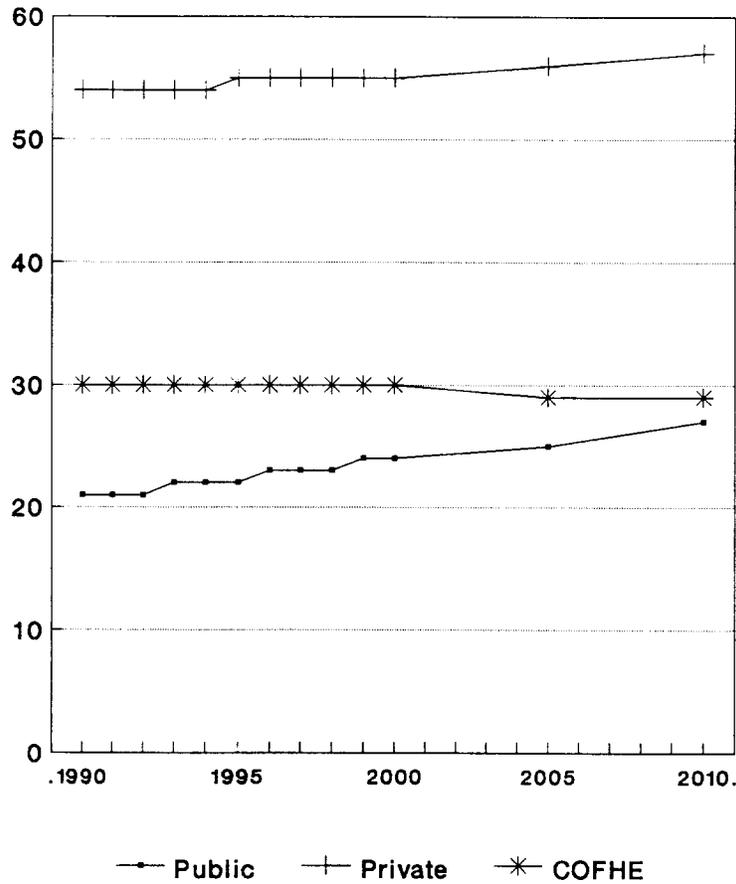
Note: Baseline projection, constant dollars.

Figure 2: Affordability: Ratio of Costs to Income



Note: Constant dollars.

Figure 3: Tuition Dependence



At COFHE institutions, the costs of attendance rise from \$19,200 to \$31,647 but the net price for aided students actually declines substantially in real terms from around \$7,800 to around \$5,500, reflecting the rapid growth in financial aid and the role that non-tuition educational revenues play in keeping down the growth in real tuition. However, despite the relatively modest tuition growth (compared with all private four-year institutions), the income burden for non-aided students attending COFHE schools rises from 20% to 26%. For aided students, on the other hand, the ratio of net price to income falls from 18% to 10%. Lastly, tuition dependency falls slightly from 30% to 29%.

The finding that continuing the 1978-79 to 1988-89 trend implies a major increase in affordability for aided students at COFHE schools follows from a rate of increase in non-tuition educational revenues that exceeds the rate of increase in educational and general expenditures along with an even faster increase in institution-based financial aid. Thus, at present, aided students at COFHE schools pay roughly the same percentage of family income (18%) as students at public schools (19%) but this income burden is well below that at all private institutions (34%); the baseline projection suggests an income

burden for aided students at COFHE schools that falls well below the comparable figures at other schools.¹⁰ The income burden for non-aided students, on the other hand, is currently about 20% at COFHE and at all private institutions (19%), and only 11% at public schools. The baseline projection suggests that this ratio will rise by a smaller amount at COFHE than other private schools, ending at 26% versus 29%, while remaining at 11% in the public sector. Hence, the gap in income burden for non-aided students attending private and public schools grows over the period.

In sum, the baseline projections indicate some reasons to worry about the general future affordability of higher education if recent trends continue. However, they do not forecast a disaster of catastrophic proportions, assuming, of course, that schools can continue to increase aid budgets at the extraordinarily rapid rates of the past decade. While the increase in burden borne by parents of non-aided students attending COFHE and other private schools is likely to have some unfortunate effects on enrollment rates, the continuation of rapid increases in non-tuition educational revenues and in institution-based financial aid puts aided students at COFHE schools in an improving position relative both to the present situation and to students at other institutions.

Alternative Scenarios

There is no reason to believe, however, that the recent growth rates used in the baseline model will continue over the next two decades. By varying these rates we produce alternative scenarios that lead to a range of affordability estimates and indicate the importance of different variables. Table 2 shows these alternative assumptions regarding growth rates.

We examined the sensitivity of our baseline projections to different assumptions about the rates of change in the variables included in our model. These alternative scenarios were developed in three sets, in which the growth rates were altered for a given variable, while all other variables were held to the rates of change included in our baseline model.

The *Assumptions*

The first set of scenarios (Group A) examines the impact of federal financial aid on college affordability. Scenario **A1** assumes that **federal aid is frozen** in real terms (both Pell and loans). Scenario **A2** assumes rapid **real growth** in federal aid, with a 4% annual real growth rate in Pell and loans. Scenario **A3** assumes **real decline** in federal aid, with a 2% annual decrease.

The second set of scenarios (Group B) varies the performance of the economy. Scenario **B1** assumes **strong economic growth**, with median family income increasing at an annual real rate of 2.5% and non-tuition revenues growing at a rate of 1 percentage point above the recent growth rate. Scenario **B2** assumes weak **economic growth**, with median family income constant in real terms, and non-tuition revenues growing at a rate of 1 percentage point below the recent growth rate.¹¹

10 Of course, as noted earlier, the median income of aided students at COFHE schools (\$43,000) far exceeds the median income of aided students at private (\$26,000) or public (\$19,000) four-year schools.

11 Note that we assume trends in real cost growth at higher education institutions are unaffected by the overall performance of the economy.

Table 2: Annual Percentage Growth Rate Assumptions for Alternative Scenarios

Scenario	Type of school	Educational costs	Non-tuition educational revenues	Pell \$	Other grants	Loans	Family income
Varying Federal Support							
No growth (A1)	COFHE	34	35	0	42	0	12
	Public	16	12	0	38	0	12
	Private	32	28	0	65	0	6
Rapid growth (A2)	COFHE	34	35	40	42	40	12
	Public	16	12	40	38	40	12
	Private	32	28	40	65	40	6
Real Decline (A3)	COFHE	34	35	- 2	42	- 2	12
	Public	16	12	- 2	38	- 2	12
	Private	32	28	- 2	65	- 2	06
Varying Performance of the Economy							
Strong (B1)	COFHE	34	45	0	42	50	25
	Public	16	22	27	38	30	25
	Private	32	38	0	65	50	25
Weak (B2)	COFHE	34	25	0	42	50	0
	Public	16	02	27	38	30	0
	Private	32	18	0	65	50	0

Continued on next page

Table 2, continued

Scenario	Type of school	Educational costs	Non-tuition educational revenues	Pell \$	Other grants	Loans	Family income
Varying Rates of Growth in Cost and Institutional Aid							
High Cost/high aid (C1)	COFHE	44	35	0	42	50	12
	Public	26	12	27	38	30	12
	Private	42	28	0	65	50	6
High Cost/low aid (C2)	COFHE	44	35	0	0	50	12
	Public	26	12	27	0	30	12
	Private	42	28	0	0	50	6
Low Cost/high aid (C3)	COFHE	24	35	0	42	50	12
	Public	6	12	27	38	30	12
	Private	22	28	0	65	50	6
Low Cost/low aid (C4)	COFHE	24	35	0	0	50	12
	Public	6	12	27	0	30	12
	Private	22	28	0	0	50	6

Group C scenarios examine the effects of various educational cost/institutional aid combinations. **Scenarios C1 and C2** assume a **high rate of cost increase** equal to 1 percentage point above the recent trend. Scenario C1 assumes that institutional aid, which is the bulk of the “other grants” category in our tables, increases at the recent high rates of real annual growth, while scenario C2 assumes no real growth in institutional aid. Scenarios C3 and C4 assume a **low rate of cost increase** equal to 1 percentage point below the recent trend. The assumed growth rates for institutional aid for scenarios C3 and C4 correspond to those in scenarios C1 and C2. Thus, scenario C3 presents a low cost growth/high aid growth scenario while scenario C4 presents a low cost/low aid scenario.

The Projections

Figures 4 - 8 show the effects of these different scenarios for the COFHE institutions on the four cost figures that we are considering. Tables A-3 and A-4 in the appendix present net price numbers for non-aided and aided students for each of the simulations for the COFHE institutions, and for public and private institutions in general. Tables A-5 and A-6 do the same for the income burden ratio while Table A-7 presents the numbers for tuition dependency. A look at the Group A simulations shows that the future of federal financial aid policy has an impact on affordability for aided students (Figure 5.A), but not for non-aided students (Figure 4.A) At COFHE schools, the baseline decline in income burden from 18% to 10% for aided students would instead go to 17% under the scenario with a real decline in federal aid, 15% under the no growth scenario, and 11% under the rapid growth scenario (Figure 7.A).¹² (In the public sector and the larger private sector, a real decline in federal aid would lead to increasing income burdens; see Table A-6.)

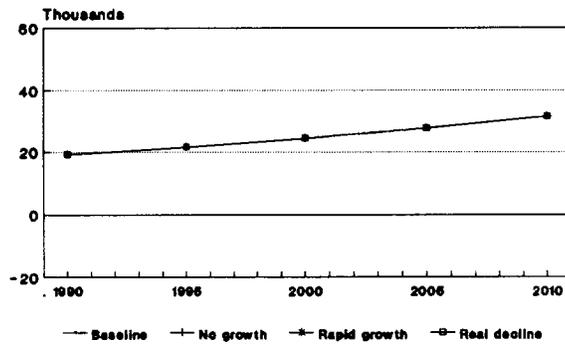
While the course of financial aid policy affects aided students, the performance of the economy affects all students in a significant way. Figure 6.B shows that the income burden for non-aided students is strongly tied to the state of the economy. The income burden for non-aided students attending COFHE schools rises from 20% to 26% in the baseline scenario. A strong economy, however, lowers the income burden for non-aided students from 20% to 11% while a weak economy increases the income burden from 20% all the way to 46%. (Different rates of economic growth have similar effects on non-aided students in the two other groups of schools, although they are less dramatic than among COFHE families.) What this means is that sluggish economic growth could lead to a decline in the rate of increase in non-tuition educational revenues. In such a scenario, COFHE schools would need to lower the rate of increase in spending significantly or tuition increases would drastically reduce the affordability of these colleges and universities.

The performance of the economy affects COFHE’s aided students more than the non-aided, although the adverse effects of a weak economy are dampened slightly in the case of non-aided students due to the effects of financial aid practices. Figure 7.B shows that the baseline decline in the income burden at COFHE schools from 18% to 10% would be replaced by an increase to 40% with a weak economy. On the other hand, a real rate of increase in non-tuition revenues in excess of the already extremely high rate (with spending remaining at the historical rate) would, by 2005, lead to a negative net price for aided students. The bottom line is that the course of the economy plays a dominant role in determining the future affordability of all types of institutions, but plays a particularly large role at COFHE schools.

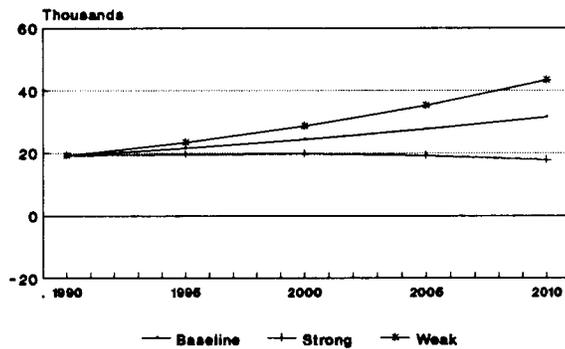
¹²The rapid growth scenario assumes a real growth rate in loans of 4 % per year, below the current rate of 5 % at COFHE and other private schools.

Figure 4: Effects of Alternative Rates of Change on COFHE Prices: Non-Aided Students

A. Federal Support



B. Performance of the Economy



C. Rates of Growth in Costs and Institutional Aid

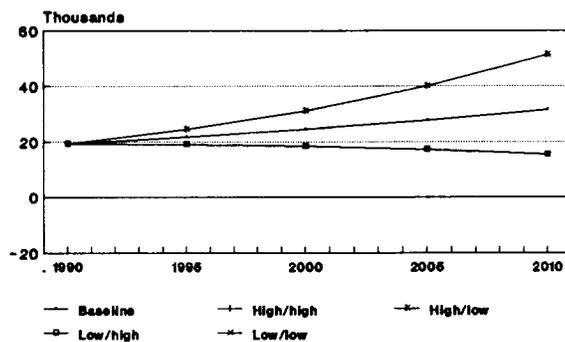
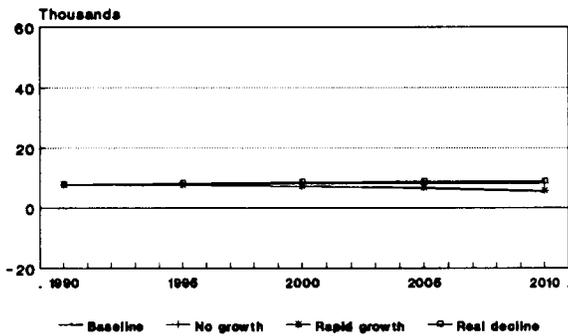
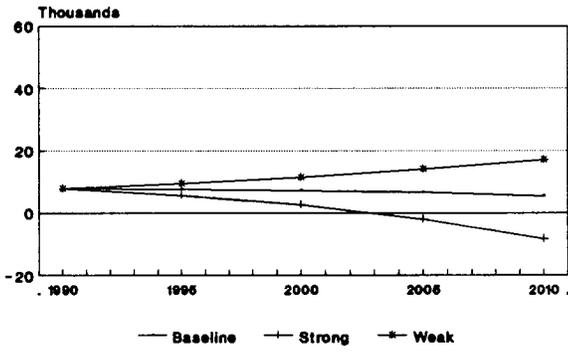


Figure 5: Effects of Alternative Rates of Change on COFHE Prices: Aided Students

A. Federal Support



B. Performance of the Economy



C. Rates of Growth in Costs and Institutional Aid

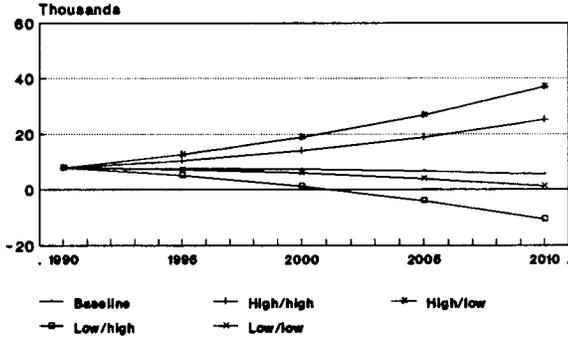
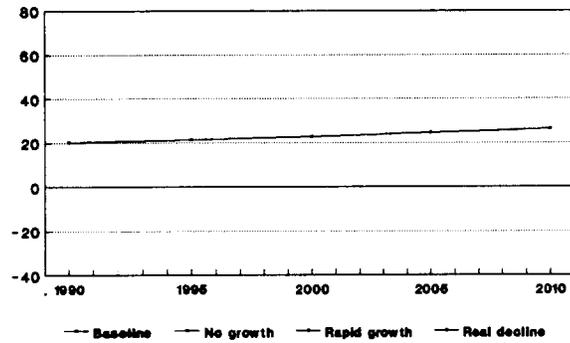
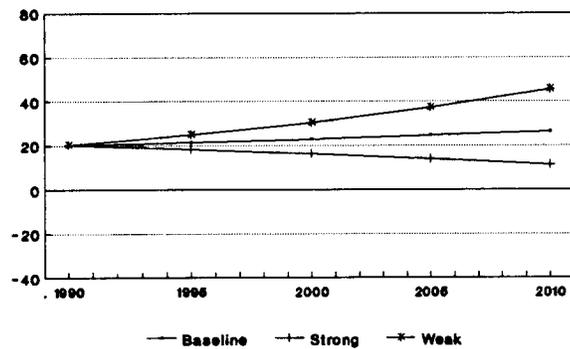


Figure 6: Effects of Alternative Rates of Change on
Income Burden: COFHE Non-Aided Students

A. Federal Support



B. Performance of the Economy



C. Rates of Growth in Costs and Institutional Aid

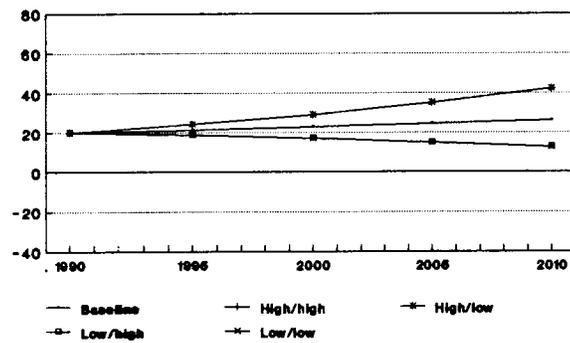
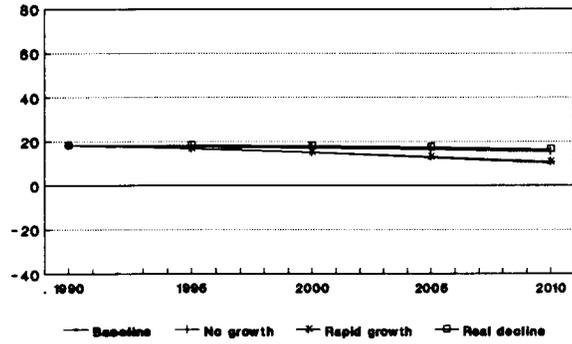
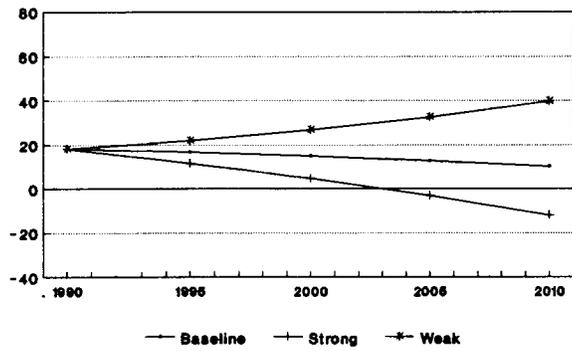


Figure 7: Effects of Alternative Rates of Change on Income Burden: COFHE Aided Students

A. Federal Support



B. Performance of the Economy



C. Rates of Growth in Costs and Institutional Aid

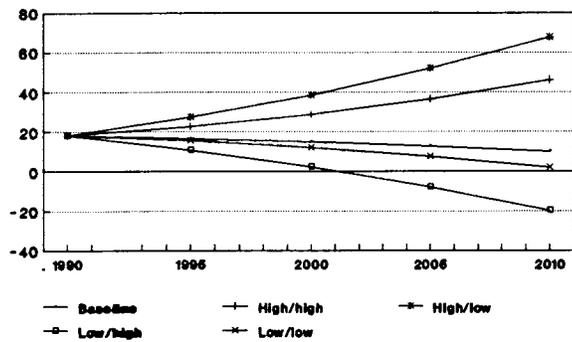
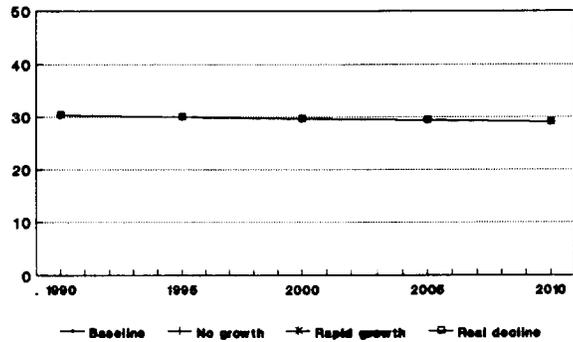
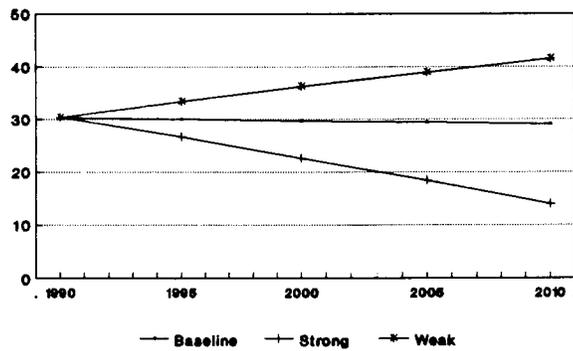


Figure 8: Effects of Alternative Rates of Change on COFHE Tuition Dependence

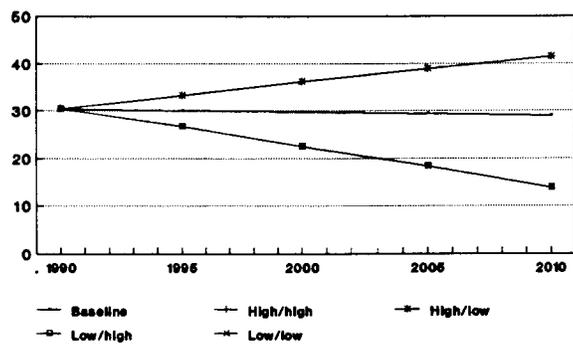
A. Federal Support



B. Performance of the Economy



C. Rates of Growth in Costs and Institutional Aid



The finding that the affordability of an education at the COFHE school is so strongly tied to the course of an unpredictable economy is obviously quite unsettling. Our projections build in several assumptions about how variations in overall economic performance will impinge on the higher education sector. First, of course, we assume that the growth in family income is closely related to overall economic conditions. Second, we assume that the growth of non-tuition educational revenues is similarly responsive. For public institutions, this translates into an assumption that state appropriations for higher education are sensitive to economic conditions, while for private institutions we assume that endowment and gift performance are similarly sensitive to economic conditions. We should also reemphasize that we do not assume that college cost growth is sensitive to overall economic conditions. One could argue the reverse: that a strong economy will both raise the demand for and the real resource costs of higher education, resulting in more rapid growth both in educational costs and tuitions. Although this assumption could easily be incorporated in our projections, it is worth noting that the historical experience is different – the rapid tuition growth of the 1980s has occurred in the face of slow or no growth in productivity and incomes.

The rest of the simulations (Group C) suggest that the rate of cost growth also has a critical effect on future affordability, with financial aid playing somewhat of a mediating effect. The combination of high cost growth and high aid growth leads to a major increase in income burden for students at all institutions, with COFHE students being particularly affected. At COFHE schools, this scenario leads to an increase in income burden from 18% to 46% for aided students and from 20% to 43% for non-aided students.¹³ High cost growth and low aid growth represents a double squeeze on aided students and their families. Under that scenario, the income burden for aided students at COFHE schools rises from 18 % to a staggering 68 % . Hence, this key ratio increases substantially given high cost growth, with large increases in institution-based aid able to go only so far in protecting the affordability of COFHE schools for aided students. (Summarizing the experiences of the other institutional groups, high cost growth has a major effect on affordability, with the prominent role of institutional aid at private institutions enabling these schools to reduce the effect of cost growth by a non-trivial amount by similarly increasing aid.)

The low cost growth scenarios, on the other hand, lead to substantial declines in the income burden. Low cost growth accompanied by high aid growth leads to a much more rapid decline in income burden for aided students at COFHE schools than under the baseline scenario. Low cost growth and low aid growth slows the decline in this ratio but, again, it is clear that the effects of cost growth dominate those of changes in institutional aid, even in the private sector. For non-aided students, the income burden is favorably affected by low cost growth, with a decline from 20% to 13% at COFHE schools.

Lastly, Figure 8 summarizes the tuition dependency results from the different scenarios. Both the cost scenarios and the economic growth scenarios have important impacts on tuition dependency. At the COFHE schools, the baseline projected a constant level of tuition dependency. This ratio rises dramatically with a weak economy, and falls, albeit somewhat less precipitously, with a strong economy. The impact of high cost growth is virtually identical to a weak economy while low cost growth is equivalent to a strong economy. It is apparent that either a weak economy or high cost growth would

¹³The effects of the high cost/high aid growth for the non-aided students come simply from the movement in costs. Just as the effects of federal financial aid support did not change the baseline projection for non-aided students, changes in the assumptions about institutional aid in the C scenarios has no effect. Thus the two High Cost and the two Low Cost scenarios in Figure 6.C are identical.

force institutions to raise tuition in order to maintain spending, resulting in substantial increases in tuition dependency.

III. Concerns About Future Affordability

The various scenarios described above provide very different pictures of the future affordability of higher education. Do some of these scenarios seem more likely than others? An important factor that is outside the control of higher education (at least in the short-run) is the performance of the national economy. Our favorable economic scenario – sustained high rates of economic growth -- appears unlikely for at least two reasons. For one, we have been in a slow growth phase for several years following the longest peacetime economic expansion in history. To assume that the 1980s will be followed by another two decades of economic progress is likely to be overly optimistic. Further, current national policies, including large government deficits and low national investment rates, do not bode well for future economic growth.

If our national economic performance is poor, the prospects for avoiding a college affordability problem are not good. In the face of slow or no growth in family incomes, the burden on families of paying for college will probably rise unless one of three things happen: (1) the underlying costs of providing college education do not grow; (2) non-tuition sources of educational revenue grow steadily; or (3) federal financial aid grows steadily. Since most observers predict shortages in faculty labor markets which are likely to make that major component of college costs grow, it is difficult to see how existing levels of educational costs could be held down without permitting the quality of college education to decline. Few observers would be satisfied with a solution to college affordability problems which took the form of declining college quality. The other two alternatives – growing non-tuition revenues or growing federal aid support – are themselves likely to depend on a healthy economy. It thus appears that a promising future for college affordability depends critically on good performance of the economy in the coming decades.

That said, what other factors will impinge crucially on college affordability? It is clear in our simulations that a critical factor is the behavior of the educational costs of institutions. Over the next two decades, the burden on families of paying for college differs by a staggering amount depending on whether college costs rise at a percentage point above or below the trend established in the 1978-79 to 1988-89 period. There has been a quite persistent tendency for college costs to grow more rapidly than inflation over the last fifty years. The reasons for this long run tendency are fairly fundamental, having largely to do with the slow rate of technical progress in this industry compared to the economy as a whole. What is distinctive about the 1980s, however, is a pattern of rapid real cost growth in colleges during a period when productivity was fairly stagnant in the rest of the economy. Massy (1990) has suggested that several phenomena, theoretically within the control of colleges and universities, have also contributed to cost increases during this period. Labeled the cost *disease* and the *academic ratchet*, **these** causes of cost increases are related to faculty working norms and curriculum structure and are more likely to provide an entry point for the control of higher education's costs than exogenous factors will.

Beginning in the mid-1990s, growth in the population of young people is likely to lead to fairly rapid increases in college enrollment (although not so rapid as in the 1960s). The resulting growth in demand may lead to pressures for cost increases as colleges attempt to expand facilities and numbers of faculty in response. On the other hand, to the extent that the increase in the numbers of high-ability student parallel the general demographic trends, competition for students among COFHE institutions may subside. If so, reductions in the costs of promotion and recruiting, and an easing of competition through

the enhancement of programs and living standards may lessen cost pressures at these highly visible institutions. Our best judgment is that the most likely future trend would have college costs grow ahead of inflation, but probably less rapidly than their unusual behavior of the 1980s. However, it seems reasonable to expect that the rapid real rates of growth in non-educational revenues in the private sector will slow, creating pressures on the revenue side that make it harder to maintain a rapid increase in institution-based aid without substantial increases in gross tuition.

It is clear that we are facing a difficult period in higher education. A close look at what would happen to college affordability if we continued recent trends, and if a variety of alternatives instead came into play, could help us choose a course of action that could minimize the impact of unfortunate exogenous events (such as a bad economy). It could also help us reach intelligent decisions about variables under our direct control (such as spending increases) which could otherwise lead us to a tenuous situation in the not too distant future.

REFERENCES

- Bosworth, Barry, Carron, Andrew S. and Rhyne, Elisabeth. 1987. The Economics of Federal Credit Programs. Washington, D.C.: The Brookings Institution.
- College Board. 1988. Annual Survey of Colleges. 1988-89. New York: College Entrance Examination Board.
- College Board. 1989. College Cost Book. New York: College Entrance Examination Board.
- COFHE. 1990. "Freshman Financial Aid/Admissions Survey" COFHE. January.
- Hauptman, Arthur. 1985. "Federal Costs for Student Loans: Is There a Role for Institution-based Lending?" Washington, D.C.: American Council on Education.
- Lewis, Gwendolyn L. 1988. Trends in Student Aid: 1980-1988. Washington, DC: Washington Office of the College Board.
- Massy, William F. 1990. "The Lattice and the Ratchet." Policy Perspectives. Volume 2. Philadelphia: University of Pennsylvania, Pew Higher Education Research Program.
- Schapiro, Morton Owen, O'Malley, Michael P., and Litten, Larry H. 1990. "Tracing the Economic Background of COFHE Students: Has There Been a 'Middle-Income Melt'?" COFHE. November.

Table A-3

Alternative projections summary for NON-AIDED students: net price

PUBLIC FOUR YEAR INSTITUTIONS		1990	1995	2000	2005	2010
<i>Baseline projection</i>						
	historical baseline	6000.0	6407.4	6860.7	7364.7	7924.1
<i>Varying federal support</i>						
A1	No growth	6000.0	6407.4	6860.7	7364.7	7924.1
A2	Rapid growth	6000.0	6407.4	6860.7	7364.7	7924.1
A3	Real decline	6000.0	6407.4	6860.7	7364.7	7924.1
<i>Varying performance of the economy</i>						
B1	Strong	6000.0	5899.2	5754.8	5559.0	5303.2
B2	Weak	6000.0	6895.8	7872.6	8937.0	10096.4
<i>Varying rates of growth in cost and institutional aid</i>						
C1	High/high	6000.0	7059.4	8308.0	9774.3	11491.0
C2	High/low	6000.0	7059.4	8308.0	9774.3	11491.0
C3	Low/high	6000.0	5780.5	5536.2	5265.2	4965.5
c4	Low/low	6000.0	5780.5	5536.2	5265.2	4965.5
PRIVATE INSTITUTIONS		1990	1995	2000	2005	2010
<i>Baseline projection</i>						
	historical baseline	13400.0	15224.3	17387.5	19951.4	22989.2
<i>Varying federal support</i>						
A1	No growth	13400.0	15224.3	17387.5	19951.4	22989.2
A2	Rapid growth	13400.0	15224.3	17387.5	19951.4	22989.2
A3	Real decline	13400.0	15224.3	17387.5	19951.4	22989.2
<i>Varying performance of the economy</i>						
B1	Strong	13400.0	14751.8	16275.5	17988.6	19908.9
B2	Weak	13400.0	15678.9	18406.3	21664.4	25549.7
<i>Varying rates of growth in cost and institutional aid</i>						
C1	High/high	13400.0	16259.4	19870.6	24419.9	30138.3
C2	High/low	13400.0	16259.4	19870.6	24419.9	30138.3
c3	Low/high	13400.0	14228.6	15111.8	16049.8	17042.0
c4	Low/low	13400.0	14228.6	15111.8	16049.8	17042.0
COHFE INSTITUTIONS		1990	1995	2000	2005	2010
<i>Baseline projection</i>						
	historical baseline	19200.0	21631.2	24469.4	27781.9	31647.1
<i>Varying federal support</i>						
A1	No growth	19200.0	21631.2	24469.4	27781.9	31647.1
A2	Rapid growth	19200.0	21631.2	24469.4	27781.9	31647.1
A3	Real decline	19200.0	21631.2	24469.4	27781.9	31647.1
<i>Varying performance of the economy</i>						
B1	Strong	19200.0	19700.9	19771.2	19204.1	17723.5
B2	Weak	19200.0	23488.4	28776.4	35274.6	43235.8
<i>Varying rates of growth in cost and institutional aid</i>						
C1	High/high	19200.0	24393.3	31159.6	39937.9	51284.1
C2	High/low	19200.0	24393.3	31159.6	39937.9	51284.1
c3	Low/high	19200.0	18974.0	18336.9	17165.0	15305.8
c4	Low/low	19200.0	18974.0	18336.9	17165.0	15305.8

Table A-4

Alternative projections summary for AIDED students: net price

PUBLIC FOUR YEAR INSTITUTIONS		1990	1995	2000	2005	2010
<i>Baseline projection</i>						
	historical baseline	3617.0	3617.6	3592.8	3534.6	3432.8
<i>Varying federal support</i>						
A1	No growth	3617.0	3841.2	4073.8	4311.7	4550.7
A2	Rapid growth	3617.0	3518.5	3358.6	3118.8	2776.6
A3	Real decline	3617.0	3984.3	4346.3	4701.1	5045.7
<i>Varying performance of the economy</i>						
B1	Strong	3617.0	3109.4	2486.9	1729.0	811.9
B2	Weak	3617.0	4106.0	4604.7	5107.0	5605.1
<i>Varying rates of growth in cost and institutional aid</i>						
C1	High/high	3617.0	4269.6	5040.1	5944.3	6999.7
c 2	High/low	3617.0	4452.8	5444.0	6614.2	7990.2
c 3	Low/high	3617.0	2990.7	2268.3	1435.2	474.2
c 4	Low/low	3617.0	3173.9	2672.2	2105.1	1464.7
PRIVATE INSTITUTIONS		1990	1995	2000	2005	2010
<i>Baseline projection</i>						
	historical baseline	8769.2	9151.4	9361.8	9279.7	8729.8
<i>Varying federal support</i>						
A1	No growth	8769.2	9397.9	9922.9	10242.4	10205.1
A2	Rapid growth	8769.2	9094.6	9250.6	9121.1	8537.5
A3	Real decline	8769.2	9532.4	10179.0	10608.4	10670.4
<i>Varying performance of the economy</i>						
B1	Strong	8769.2	8678.8	8249.8	7316.9	5649.5
B2	Weak	8769.2	9605.9	10380.5	10992.6	11290.4
<i>Varying rates of growth in cost and institutional aid</i>						
C1	High/high	8769.2	10186.4	11844.8	13748.1	15879.0
c 2	High/low	8769.2	11382.1	14678.6	18826.3	24032.3
c 3	Low/high	8769.2	8155.7	7086.1	5378.1	2782.7
c 4	Low/low	8769.2	9351.3	9919.9	10456.3	10936.0
COHFE INSTITUTIONS		1999	1995	2000	2005	2010
<i>Baseline projection</i>						
	historical baseline	7790.9	7623.0	7245.8	6579.7	5521.0
<i>Varying federal support</i>						
A1	No growth	7790.9	8093.9	8317.8	8418.8	8339.1
A2	Rapid growth	7790.9	7640.9	7313.6	6744.1	5848.5
A3	Real decline	7790.9	8294.8	8700.2	8965.4	9034.1
<i>Varying performance of the economy</i>						
B1	Strong	7790.9	5692.6	2547.5	-1998.1	-8402.6
B2	Weak	7790.9	9480.2	11552.7	14072.4	17109.6
<i>Varying rates of growth in cost and institutional aid</i>						
C1	High/high	7790.9	10385.0	13936.0	18735.8	25158.0
c 2	High/low	7790.9	12513.3	18678.5	26689.8	37056.9
c 3	Low/high	7790.9	4965.7	1113.2	-4037.1	-10820.3
c 4	Low/low	7790.9	7094.0	5855.8	3916.9	1078.6

Table A-S

Projections summary for NON-AIDED students: income burden

Public four year institutions		1990	1995	2000	2005	2010
Baseline projection						
	historical baseline	31.6	31.8	32.0	32.4	32.9
Varying federal support						
A1	No growth	10.7	10.8	10.9	11.0	11.1
A2	Rapid growth	10.7	10.8	10.9	11.0	11.1
A3	Real decline	10.7	10.8	10.9	11.0	11.1
Varying performance of the economy						
B1	Strong	10.7	9.3	8.0	6.9	5.8
B2	Weak	10.7	12.3	14.1	16.0	18.0
Varying rates of growth in cost and institutional aid						
C1	High/high	10.7	11.9	13.2	14.6	16.2
c2	High/low	10.7	11.9	13.2	14.6	16.2
c3	Low/high	10.7	9.7	8.8	7.9	7.0
c4	Low/low	10.7	9.7	8.8	7.9	7.0
Private institutions		1990	1995	2000	2005	2010
Baseline projection						
	historical baseline	18.9	20.8	23.1	25.7	28.7
Varying federal support						
A1	No growth	18.9	20.8	23.1	25.7	28.7
A2	Rapid growth	18.9	20.8	23.1	25.7	28.7
A3	Real decline	18.9	20.8	23.1	25.7	28.7
Varying performance of the economy						
B1	Strong	18.9	18.4	17.9	17.5	17.1
B2	Weak	18.9	22.1	25.9	30.5	36.0
Varying rates of growth in cost and institutional aid						
C1	High/high	18.9	22.2	26.4	31.4	37.7
c2	High/low	18.9	22.2	26.4	31.4	37.7
c3	Low/high	18.9	19.4	20.0	20.7	21.3
c4	Low/low	18.9	19.4	20.0	20.7	21.3
COFHE institutions		1990	1995	2000	2005	2010
Baseline projection						
	historical baseline	20.2	21.5	22.9	24.5	26.2
Varying federal support						
A1	No growth	20.2	21.5	22.9	24.5	26.2
A2	Rapid growth	20.2	21.5	22.9	24.5	26.2
A3	Real decline	20.2	21.5	22.9	24.5	26.2
Varying performance of the economy						
B1	Strong	20.2	18.3	16.3	14.0	11.4
B2	Weak	20.2	24.7	30.3	37.1	45.5
Varying rates of growth in cost and institutional aid						
C1	High/high	20.2	24.2	29.1	35.2	42.5
c2	High/low	20.2	24.2	29.1	35.2	42.5
c3	Low/high	20.2	18.8	17.1	15.1	12.7
c4	Low/low	20.2	18.8	17.1	15.1	12.7

Table A-6

Projections summary for AIDED students: income burden

Public four year institutions		1990	1995	2000	2005	2010
Baseline projection						
	historical baseline	19.0	17.9	16.8	15.6	14.2
Varying federal support						
A1	No growth	19.0	19.0	19.0	19.0	18.9
A2	Rapid growth	19.0	17.4	15.7	13.7	11.5
A3	Real decline	19.0	19.8	20.3	20.7	20.9
Varying performance of the economy						
B1	Strong	19.0	14.5	10.2	6.3	2.6
B2	Weak	19.0	21.6	24.2	26.9	29.5
Varying rates of growth in cost and institutional aid						
C1	High/high	19.0	21.2	23.5	26.2	29.0
c2	High/low	19.0	22.1	25.4	29.1	33.1
c3	Low/high	19.0	14.8	10.6	6.3	2.0
c4	Low/low	19.0	15.7	12.5	9.3	6.1
Private institutions		1990	1995	2000	2005	2010
Baseline projection						
	historical baseline	33.7	34.2	33.9	32.6	29.8
Varying federal support						
A1	No growth	33.7	35.1	35.9	36.0	34.8
A2	Rapid growth	33.7	33.9	33.5	32.1	29.1
A3	Real decline	33.7	35.6	36.9	37.3	36.4
Varying performance of the economy						
B1	Strong	33.7	29.5	24.8	19.4	13.3
B2	Weak	33.7	36.9	39.9	42.3	43.4
Varying rates of growth in cost and institutional aid						
C1	High/high	33.7	38.0	42.9	48.3	54.2
c2	High/low	33.7	42.5	53.2	66.2	82.0
c3	Low/high	33.7	30.4	25.7	18.9	9.5
c4	Low/low	33.7	34.9	35.9	36.8	37.3
COFHE institutions		1990	1995	2000	2005	2010
Baseline projection						
	historical baseline	18.1	16.7	15.0	12.8	10.1
Varying federal support						
A1	No growth	18.1	17.7	17.2	16.4	15.3
A2	Rapid growth	18.1	16.7	15.1	13.1	10.7
A3	Real decline	18.1	18.2	18.0	17.4	16.6
Varying performance of the economy						
B1	Strong	18.1	11.7	4.6	-3.2	-11.9
B2	Weak	18.1	22.0	26.9	32.7	39.8
Varying rates of growth in cost and institutional aid						
C1	High/high	18.1	22.8	28.8	36.4	46.1
c2	High/low	18.1	27.4	38.6	51.9	67.9
c3	Low/high	18.1	10.9	2.3	-7.9	-19.8
c4	Low/low	18.1	15.5	12.1	7.6	2.0

Table A-7

Projections summary: tuition dependency

Public four year institutions		1990	1995	2000	2005	2010
Baseline projection						
	historical baseline	20.8	22.4	23.9	25.4	26.8
Varying federal support						
A1	No growth	20.8	22.4	23.9	25.4	26.8
A2	Rapid growth	20.8	22.4	23.9	25.4	26.8
A3	Real decline	20.8	22.4	23.9	25.4	26.8
Varying performance of the economy						
B1	Strong	20.8	18.5	16.0	13.5	10.9
B2	Weak	20.8	26.1	31.1	35.7	40.0
Varying rates of growth in cost and institutional aid						
C1	High/high	20.8	26.1	31.0	35.6	39.9
c 2	High/low	20.8	26.1	31.0	35.6	39.9
c 3	Low/high	20.8	18.4	16.0	13.4	10.8
c 4	Low/low	20.8	18.4	16.0	13.4	10.8
Private institutions		1990	1995	2000	2005	2010
Baseline projection						
	historical baseline	53.6	54.5	55.4	56.3	57.1
Varying federal support						
A1	No growth	53.6	54.5	55.4	56.3	57.1
A2	Rapid growth	53.6	54.5	55.4	56.3	57.1
A3	Real decline	53.6	54.5	55.4	56.3	57.1
Varying performance of the economy						
B1	Strong	53.6	52.3	50.9	49.4	47.9
B2	Weak	53.6	56.7	59.6	62.2	64.7
Varying rates of growth in cost and institutional aid						
C1	High/high	53.6	56.7	59.5	62.1	64.6
c 2	High/low	53.6	56.7	59.5	62.1	64.6
c 3	Low/high	53.6	52.3	50.8	49.4	47.9
c 4	Low/low	53.6	52.3	50.8	49.4	47.9
COFHE institutions		1990	1995	2000	2005	2010
Baseline projection						
	historical baseline	30.4	30.0	29.7	29.4	29.0
Varying federal support						
A1	No growth	30.4	30.0	29.7	29.4	29.0
A2	Rapid growth	30.4	30.0	29.7	29.4	29.0
A3	Real decline	30.4	30.0	29.7	29.4	29.0
Varying performance of the economy						
B1	Strong	30.4	26.6	22.6	18.4	14.0
B2	Weak	30.4	33.4	36.2	38.9	41.5
Varying rates of growth in cost and institutional aid						
C1	High/high	30.4	33.3	36.2	38.9	41.4
c 2	High/low	30.4	33.3	36.2	38.9	41.4
c 3	Low/high	30.4	26.6	22.5	18.3	13.8
c 4	Low/low	30.4	26.6	22.5	18.3	13.8