REPORT OF THE COMMITTEE ON THE ECONOMIC STATUS OF THE FACULTY OF YALE COLLEGE AND THE GRADUATE SCHOOL

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ECONOMIC STATUS OF THE FACULTY

1. Introduction

The future of Yale depends in large measure on the quality and dedication of its faculty. Yet to maintain and, one would hope, to increase the value of the educational opportunities available to undergraduate and graduate students at Yale, all the resources of the university must be allocated among today's needs and future requirements with an awareness of the competitive market within which Yale must function when it attempts to attract faculty, students, and financial beneficiaries. The endowment must be protected for future generations of Yale students, faculty and society; the balance of tuition, fees, and financial aid at Yale must not diverge notably from that adopted by educational institutions with student bodies of comparable quality and diversity; the combination of salary, fringe benefits, and amenities received by Yale faculty must not deteriorate relative to those at other first-rate universities. On the one hand, it may appear relatively easy at times to live within these three countervailing financial constraints, as during the 1950s and 1960s when the academic establishment generally expanded and salaries increased more rapidly for faculty members than they did for the average worker. Yale faculty also prospered in this boom, perhaps even gaining ground relative to faculty at competitive institutions. On the other hand, the 1970s have required compromises among these objectives: difficult choices have had to be made among commitments even in important and exciting fields of teaching and research, at the same time that faculty salaries have nonetheless fallen and student fees risen relative to the general level of prices. Yale faculty do not need to be told that they have also shared in this fate, but more worrisome are the indications that the level of Yale faculty salaries and fringe benefits have deteriorated relative to those at other leading institutions.

A comprehensive analysis of the sources of income available to Yale and the composition of its expenditures and personnel policy is an enormous undertaking. But only at this global level can one adequately evaluate strategies that Yale might consider to regain its financial equilibrium with the least sacrifice of important valued features in the student-faculty community. Such

a study is long overdue at Yale, and the Budget Report of December 1977[1] was a first step in this direction, undertaken, characteristically, with little or no faculty participation. The committee does not subscribe to the explicit financial assumptions or the implicit priorities that determined the magnitude and timing of the retrenchments proposed for the next five years in the Budget Report and endorsed by the Corporation. The committee is critical of the past failures of the Corporation and administration in not dealing in a timely fashion with the chronic financial problems of the late 1960s, which were patently evident to the Blum-Pelikan Faculty Committee in 1972 but systematically overlooked by the then existing administration. Reflecting the limited historical data base at Yale and the scarcity of policy position papers that would help in evaluating these complex policy options, the committee has restricted its focus to only those few aspects of a long-term, university-wide problem of fiscal management having the most immediate effect on the faculty.

The committee's working agenda accepted the mandate provided by the Faculty of Arts and Sciences to gather information as to the "economic status of the faculty." Thus, our goal is to consider only one of the three constraints--faculty economic status--within which Yale must operate. In collecting and interpreting evidence, the committee has emphasized faculty status at Yale relative to that at approximately comparable institutions. This approach is not meant to minimize the difficulty that faculty have living on Yale compensation; indeed, from 1970/71 to 1977/78, AAUP figures suggest real compensation of Yale faculty fell 2 1/2 percent per year, adjusted for the declining value of the dollar. This development has broad repercussions for faculty morale and institutional loyalty at a time when the administration needs the support and understanding of various faculty constituencies to achieve necessary retrenchments. Although this recent reversal in the fortunes of Yale faculty is a divisive and distressing issue, these trends must also be evaluated from the perspective of real salary developments at other institutions that offer comparable opportunities for career training and advancement at the junior faculty level, and comparable teaching and research opportunities at the senior faculty level.

The committee's report is ordered as follows. Section 2 surveys recent

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1. Achieving Financial Equilibrium at Yale: A Report on the Budget, Yale University, December 1977. See also the Supplement to the Budget Report, also released at the end of 1977.

changes in the economic status of faculty in the United States and the changes likely for the remainder of the century. Section 3 considers the recent deterioration in the level of real compensation of Yale faculty, relative to levels at other universities. Section 4 explores in more detail the ways in which the level and composition of fringe benefits might be changed. Section 5 addresses the disturbing evidence of an abrupt decline in research funding in Yale's Faculty of Arts and Sciences and offers a set of policies that might cure this financial malaise attributable to the neglect of earlier administrations. Section 6 sketches the overall requirements of a university budgeting system suitable for more efficient decentralized management of Yale's complex resources and multiple objectives. In section 7 the committee proposes ways in which the faculty can participate more fully and effectively in Yale's governance and exercise their appropriate leadership role in the long-term financial and curricular planning of the university. The last section reviews the conclusions of the report and restates the major recommendations.

2. The Economic Status of Faculty in the United States

Before considering in some detail the economic status of Yale faculty, it is reasonable to review historic trends in faculty status for the United States, and equally important to indicate what we expect the future to hold. An appraisal of the way in which circumstances at Yale have diverged from those elsewhere is given in the next section. The difficult task of seeking an explanation for Yale's distinctive developments is postponed to Sections 4, 5 and 6.

A long-run leveling has occurred in most industrially advanced countries in this century, and faculty have not been immune to these fundamental forces. Inequality in relative income and earnings has diminished, and, with the notable exception of physicians, the income position of most professionals and skilled workers relative to that of less skilled workers has diminished. Two illustrative series of data are plotted in Figure 2.1 to suggest that faculty have participated in this long-term phenomenon.[1]

The first set of data presents the ratio of the salary of an associate professor to that earned by an average nonfarm unskilled laborer who was employed 2000 hours a year. It suggests that in 1910 the average associate professor received four times the income of an unskilled laborer and that since 1950 his salary has fluctuated, averaging aoout twice that of the unskilled worker. The second series in Figure 2.1 reports the ratio of academic-year compensation of all U.S. faculty to the average annual compensation of all civilian full-time employees. This ratio falls from 2.9 in 1904 to about 1.5 in the postwar period. The decline of about one-half in the relative premium paid to faculty does not imply that the absolute income advantage of faculty has declined in constant dollars. According to the second set of estimates, faculty received $3348 more than the average full-time worker in 1904, expressed in 1967 dollars, and by 1975 their salary advantage had increased to $4030, measured in the same

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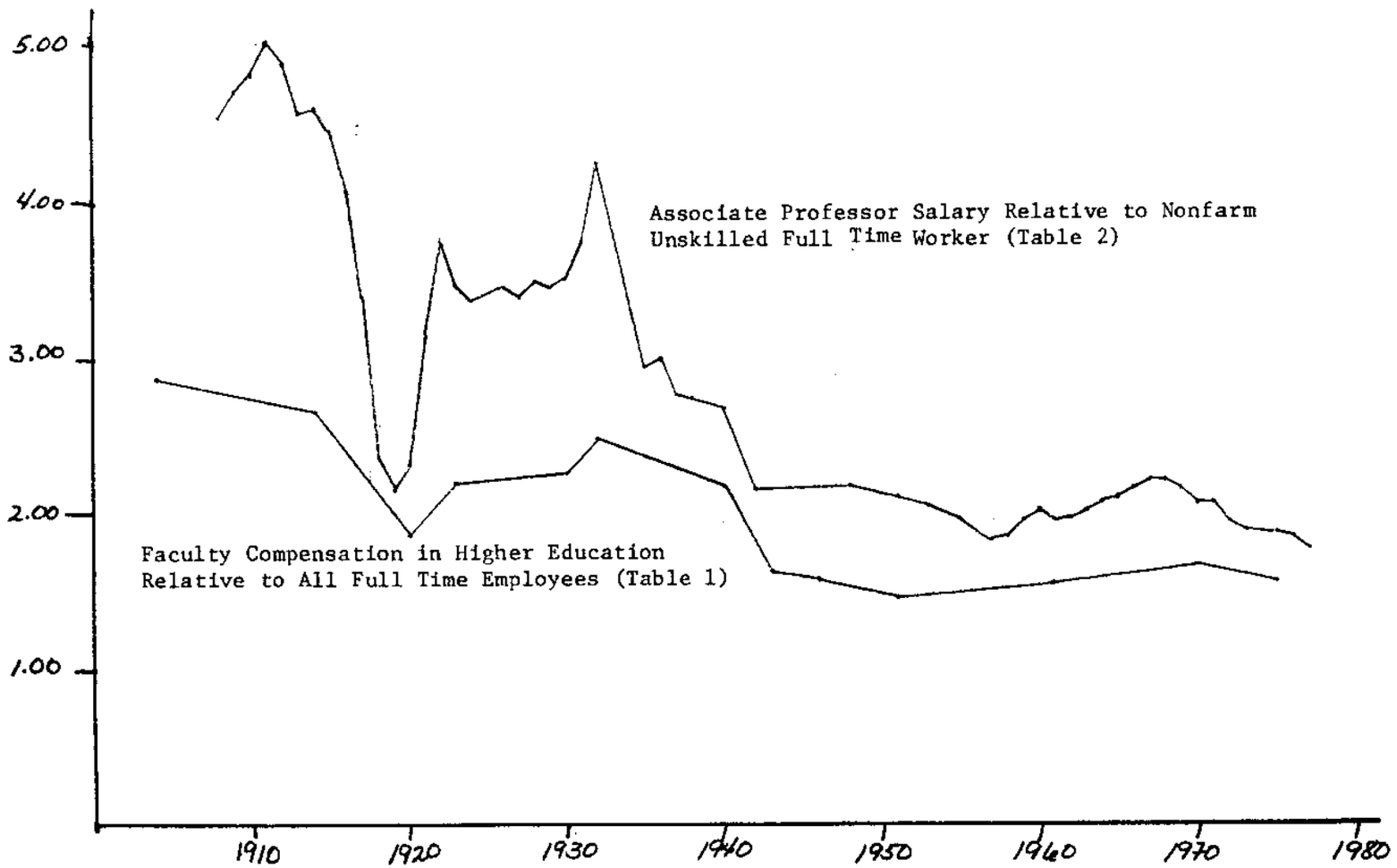
1. Long time series of this sort are notoriously difficult to construct on a consistent basis. But these independent series tell similar stories.

Figure 2.1

The Trend in Faculty Salaries in the United States
Relative to Wages of Other Workers



Source: Table A-1 and A-2.

purchasing power. But during this seventy-year period, the real salary of faculty increased only 124 percent, whereas incomes of all civilian workers increased 320 percent. The long-run trend in faculty economic status relative to the average is unmistakably downward. This is consistent with other indicators of diminishing wage differentials across skill groups in high-income, industrially advanced societies.

Aside from this long-term trend, several short- and median-term developments help to explain past fluctuations in faculty relative compensation, and provide a basis for predicting the future. Before the Second World War, faculty salaries lagged behing changes in the price level for plausible institutional reasons. Faculty salaries increased in real terms during periods of falling prices, such as 1930-32, and decreased in periods of rising prices, such as 1915-19 and 1940-42. In the postwar era, more moderate fluctuations in the rate of inflation have been less closely linked to faculty relative incomes. The recent unanticipated acceleration in inflation may again have imposed a transitory penalty on faculty salaries. But because other factors dictate retrenchments throughout higher education, this transitory loss sustained by faculty real salaries due to inflation in the 1970s may become permanent.

Since 1950, and perhaps before, demographic factors have exerted a pronounced effect on the rate of expansion of higher education, and have thereby influenced the incremental demand for faculty and the income status of faculty relative to other workers. Swings in the crude birth rate from a low in the 1930s to a high in the 1950s to a new low in the 1970s have led to major fluctuations in the rate of growth of the U.S. college-aged population. The upward trend in the proportion of those age groups attending college in the 1950s and 1960s exaggerated the expansion cycle of higher education. The recent decline in college enrollment rates and the predicted future stability of enrollment rates will do little to soften the effect of a sharp decline in the numbers of college-aged youth which will continue at least through 1995.[2] The imminent contractionary phase in higher education implies even more leveraged fluctuations in the demand for new faculty. Morever, recent U.S. and Connecticut legislation delaying retirements will impose an additional constraint on the demand for new faculty in the years immediately ahead. Finally, the past expansion of graduate education has provided many fields with many more ad-

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2. In Table A-3 the growth in college enrollments is divided into demographic population growth and growth in enrollment rates for each decade of this century to illustrate the observations made in this paragraph.

vanced-degree holders at a time when their employment prospects, at least in higher education, have dwindled.

The increase in faculty compensation relative to that of other workers which occurred from the mid-1950s to the late 1960s can be attributed to the expansive demographic pressures and rising enrollment rates of this period. The expanded supply of persons with advanced training in the late 1960s coincided with a sharp reduction in the demand for new faculty. Faculty salaries managed to continue to increase relative to the price level until about 1969, and probably began to decline relative to the salary of the average worker after about 1967. The prospects for faculty compensation increasing in the future at the same rate as that experienced elsewhere in the economy are bleak, unless major reforms are introduced in higher education, such as increasing student/teacher ratios, or legislating public subsidies, or expanding university-funded research as in the 1950s and 1960s. Unfortunately, none of these developments seems likely, though small gains in each sphere might prevent a significant deterioration in faculty real compensation.

U.S. faculty salaries by rank are reported from 1957/58 to 1975/76 in Table 2.1. The first entry is in current nominal dollars and the second is adjusted for inflation and expressed in constant 1967 dollars, as will be the practice throughout this report. In nominal terms, salaries have increased throughout the period, but in real terms they peaked, as noted above, in 1967-69. For the decade of expansion in higher education, 1957-59 to 1967-69, real salaries of professors and assistant professors grew by 3.1 and 3.2 percent per year, respectively. This was more than the growth in nonfarm business hourly compensation, which increased at 2.7 percent per year in this period. Conversely, from 1967-69 to 1975/76, real faculty salaries at all ranks decreased by about 1.1 percent per year, while nonfarm business compensation grew at 1.2 percent per year. In the last two years, 1975/76 to 1977/78, AAUP figures suggest faculty salaries have increased at about the same rate as inflation: real gains have been negligible.

In the decade 1959-69, faculty benefited first from a period of prosperity, stimulated by unprecedented expansion. This was followed by the last decade of deteriorating real incomes. Given the growing number of persons with advanced degrees, many of whom are seeking a niche in academe, and the lack of additional jobs in higher education, market pressures in the next decade or two are likely to reassert the historic trend of leveling, reducing further the economic status of faculty relative to that of the average U.S. worker. The next section examines how Yale faculty have fared in this unstable academic economy.

T 2.1

U.S. Faculty Salaries and Their Growth, by Rank, in Nominal and 1967 Dollars: 1957/58 - 1975/76

ACADEMIC YEARS	CONSUMER PRICE INDEX* 1967=1.00		AVERAGE ACADEMIC YEAR SALARY PROFESSOR	ASSOCIATE	ASSISTANT	ANNUAL AVERAGE RATE OF REAL SALARY GROWTH FROM PREVIOUS PERIOD PROFESSOR	ASSOCIATE	ASSISTANT
1957/58-1958/59	.855	nominal $	11,800	8,530	6,790			
		1967 $	13,800	9,980	7,940			
1959/60-1960/61	.880	nominal $	13,050	9,280	7,400			
		1967 $	14,830	10,550	8,410	+3.66	+2.81	+2.91
1961/62-1962/63	.901	nominal $	14,450	10,220	8,130			
		1967 $	16,040	11,340	9,020	+4.00	+3.67	+3.56
1963/64-1964/65	.923	nominal $	16,110	11,310	8,990			
		1967 $	17,450	12,250	9,740	+4.30	+3.93	+3.91
1965/66-.966/67	.959	nominal $	17,910	12,580	10,010			
		1967 $	18,680	13,120	10,440	+3.46	+3.48	+3.53
1967/68-1968/69	1.021	nominal $	19,930	13,920	11,170			
		1967 $	19,520	13,630	10,940	+2.22	+1.92	+2.36
1969/70-1970/71	1.131	nominal $	21,080	14,740	11,970			
		1967 $	18,640	13,030	10,580	-2.29	-2.23	-1.66
1971/72	1.213	nominal $	21,930	15.440	12,630			
		1967 $	18,080	12,730	10,410	-3.00	-2.30	-1.61
1972/73	1.253	nominal $	23,010	16,230	13,220			
		1967 $	18,360	12,950	10,550	+1.55	+1.73	+1.34
1973/74	1.331	nominal $	24,450	16,970	13,900			
		1967 $	18,370	12,750	10,440	+ .05	-1.54	-1.04
1974/75	1.471	nominal $	26,040	18,180	14,790			
		1967 $	17,700	12,360	10,050	-3.65	-3.06	-3.74
1975/76	1.612	nominal $	27,650	19,380	15,740			
		1967 $	17,150	12,020	9,760	-3.11	-2.75	-2.89

*The real salary figures are obtained by dividing salary figures provided by the AAUP or the Eisenhower Committee on Education by the Consumer Price Index for the calendar year in which the academic year starts. It should be noted that these data are not identical to the AAUP full-time faculty compensation figures of cooperating institutions with professorial rank, though they parallel that series closely since 1980.

3. Level, Trend, and Structure in Yale Faculty Compensation

Recent data on Yale faculty compensation were obtained with the cooperation of the American Association of University Professors (AAUP). Their records for Yale and for a group of six other schools chosen for comparison extend back to 1963/64, or fourteen years. The AAUP figures for total compensation (i.e., salary and fringe benefits for the academic nine-month year) for regular ladder faculty are adjusted for inflation and expressed in real 1967 dollars, and shown by rank in Table 3.1.[1] Faculty compensation at Yale increased in real terms until 1970/71. Since that time it has deteriorated sharply, though after 1975/76 the compensation of assistant professors increased while that of full professors continued to decrease. Current statements of the administration suggest a continuation of this new trend is in prospect for 1979/80, with the compensation of professors decreasing by another three percent or so while that of assistant professors increases about one percent.[2] From the actual record of the past seven years, summarized in Table 3.1, the real compensation of professors and assistant professors has fallen 16.7 percent, whereas associate professors experienced a somewhat smaller decline of 14.7 percent. Although a similar cycle is evident in the faculty compensation data for the comparison group of six other universities, the recent deterioration in their average compensation is less than half as great as that at Yale, being 6.6, 6.8, and 7.5 percent for

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1. The committee appreciates the assistance of Ms. Maryse Eymonerie of the AAUP Wahington Office for providing these data. Institutional data are grouped before 1970 to preserve confidentiality. In the last few years the AAUP function of collecting salary and fringe benefit data on faculty has been assumed by the Federal Higher Education General Survey (HEGIS XII), but the data are still published in summary form in the AAUP Bulletin each summer. The AAUP figures refer to faculty exclusive of those in medical and nursing schools. At Yale as of January 1978 the average salary figures for only the Faculty of Arts and Sciences was similar to the AAUP base including the professional schools, except for medicine and nursing.

2. Reports are circulating that the increase in senior faculty salaries pool will be 6 percent in 1979/80, and in junior faculty pool, 10 percent. Inflation has been about 9 percent in 1978, and is assumed to continue at that rate in 1979.

Table 3.1

Academic Year Compensation in Thousands of 1967 Dollars and Real Annual Rate of Growth of Compensation For Yale and a Group of Selected Universities: 1963/64 - 1977/78

ACADEMIC YEAR	YALE			COMPARISON GROUP*		
	PROFESSOR	ASSOCIATE	ASSISTANT	PROFESSOR	ASSOCIATE	ASSISTANT
1963/64	19.9	12.8	9.5	19.1	12.9	10.3
1966/67	22.0	14.0	10.5	21.5	14.7	11.5
1970/71	24.5	15.0	11.4	21.3	14.8	12.0
1972/73	23.7	14.4	10.9	21.4	15.3	12.2
1973/74	23.2	14.0	10.4	21.1	15.1	12.2
1974/75	21.7	12.9	9.5	20.4	14.4	11.7
1975/76	21.2	12.7	9.2	19.9	14.0	11.2
1976/77	20.9	12.8	9.5	19.9	13.8	11.2
1977/78	20.4	12.8	9.5	19.9	13.8	11.1
	IMPLIED REAL ANNUAL RATE OF GROWTH OR DECLINE					
1963/64-1966/67	+3.0	+2.9	+3.6	+4.0	+4.5	+3.7
1966/67-1970/71	+2.7	+1.7	+2.1	- .2	+ .2	+1.1
1970/71-1972/73	-1.6	-2.0	-2.2	+ .2	+1.7	+ .8
1972/73-1973/74	-2.1	-2.8	-4.6	-1.4	-1.3	0.0
1973/74-1974/75	-6.5	-7.9	-8.7	-3.3	-4.6	-4.1
1974/75-1975/76	-2.3	-1.6	-3.2	-2.5	-2.8	-4.3
1975/76-1976/77	-1.4	+ .8	+3.3	0.0	-1.4	0.0
1976/77-1977/78	-2.4	0.0	0.0	0.0	0.0	- .9

* Compensation is a weighted average of the compensation at Harvard, Chicago, Stanford, Columbia, Michigan (Ann Arbor), and Wisconsin (Madison) to preserve confidentiality of data for the years before 1970/71.

Source: AAUP-provided tabulations and published reports. AAUP data refer to ladder faculty excluding schools of medicine and nursing.

full, associate, and assistant professors, respectively, in the period 1970/71 to 1977/78. Our first conclusion from the study of Yale's faculty compensation policy is that Yale's administration in a period of emerging fiscal imbalance chose to reduce faculty compensation by more than a seventh, roughly twice the decline chosen by a group of six other, roughly comparable, universities.

Since 1970/71, the AAUP has published in their Bulletin the salary and fringe benefit figures which they receive annually from Yale and other institutions of higher education. The relevant data are reported for Yale and eleven other schools in Appendix Table A-4, and summarized by rank in Table 3.2, where Yale compensation is reported in nominal current dollars, and compensation at each of eleven other schools is reported as a percentage of Yale's level. Thus, a figure of 111.2 for Harvard assistant professors in 1977/78 implies that Harvard paid its assistant professors last year 11.2 percent more than did Yale.

In 1970/71, associate professors at Yale were paid at the same level as that averaged across the eleven universities, whereas assistant professors were 4 percent below the unweighted average at the other institutions, and professors 13 percent above the average.[3] In particular, Yale's professorial compensation levels were 5 percent above those of Harvard,7 percent above those of Chicago,11 percent above those of Princeton, and 12 percent above those of Stanford. Assistant professor salaries, on the other hand, were, on the average, some six percent behind levels at these leading institutions. Seven years later in 1977/78, Yale had lost ground at all ranks, falling to about the median for professors, or on average 2.6 percent more than the group, while associate professors were paid 6.2 percent less than the average of these eleven universities, and assistant professors, 14.7 percent less. On average the compensation of Yale faculty relative to that of faculty at eleven other institutions declined, compensation of Yale professors by 10 percent, and of associate and assistant professors, 7 and 11 percent respectively.

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3. These are unweighted averages across the eleven representative institutions. See Table A-4 notes for certain irregularities in data for certain institutions over time. It should be mentioned that with respect to compensation comparisons for professors it would be desirable to standardize for age of the faculty member. For example, the California faculty may have been younger in the initial period when it had grown rapidly than in the final period, which would understate its salary position vis-á-vis Yale in the initial period and overstate its gain during the period. Among private universities this factor should be less of a problem. Age of faculties was not readily available to adjust the data.

Table 3.2

Yale Faculty Compensation by Rank, and Compensation at Selected Institutions as a Percentage of Yale's: 1970/71 - 1977/78

	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78
YALE PROFESSOR								
Compensation ($000)	28.5	28.9	29.7	30.9	32.0	34.1	35.6	37.1
(Index Yale=100)								
Harvard	95.4	97.6	95.?	100.6	101.6	104.7	108.1	110.2
Chicago	93.3	95.2	97.0	99.4	99.7	99.1	98.6	100.3
Princeton	89.5	89.3	90.6	91.3	94.7	93.8	95.5	99.5
Stanford	87.7	91.4	92.3	93.9	95.9	95.9	99.2	103.0
Columbia	90.5	90.7	94.6	94.8	97.2	97.7	100.0	101.1
Brown	84.9	84.1	85.5	86.1	87.8	85.6	82.6	87.1
Rochester	89.5	91.7	91.3	90.9	90.0	89.7	98.6	92.2
MIT	90.9	92.7	92.6	94.2	97.5	99.1	99.4	101.1
Michigan	83.5	86.2	88.2	90.0	93.1	92.7	92.7	94.3
Wisconsin	74.4	77.5	81.5	81.6	84.1	83.9	84.3	86.0
California	81.8	81.3	87.2	88.0	92.2	93.6	92.4	95.4
YALE ASSOCIATE PROFESSOR								
Compensation ($000)	17.4	18.2	18.1	18.7	19.1	20.5	21.9	23.3
(Index Yale=100)								
arvard	106.9	105.0	111.6	104.8	110.5	108.8	105.0	102.1
Chicago	106.3	105.5	108.8	111.2	114.7	114.2	111.4	109.4
Princeton	95.4	93.4	98.9	101.1	105.8	104.4	102.7	103.9
Stanford	102.9	102.8	108.8	108.6	111.0	114.6	112.3	112.0
Columbia	99.4	100.6	106.6	107.5	111.5	110.7	109.6	110.3
Brown	96.6	95.1	100.0	104.3	104.2	101.0	96.8	97.4
Rochester	104.0	103.9	106.6	108.0	108.4	107.8	116.0	106.4
MIT	98.3	97.3	101.7	108.0	110.5	111.2	109.6	109.0
Michigan	100.6	101.1	107.7	111.2	115.2	112.2	110.5	109.9
Wisconsin	89.7	89.6	98.3	99.5	103.7	102.4	100.5	100.4
California	91.4	86.8	97.8	100.5	107.3	107.8	105.0	107.3
YALE ASSISTANT PROFESSOR								
Compensation ($000)	13.2	13.9	13.6	13.8	14.0	14.8	16.2	17.2
(Index Yale=100)								
Harvard	108.3	107.9	107.4	113.0	114.3	116.2	111.1	111.1
Chicago	109.1	109.4	114.7	120.3	123.6	123.6	121.6	120.4
Princeton	99.2	95.7	102.9	104.4	107.9	108.8	102.5	102.9
Stanford	106.8	105.8	115.4	119.6	119.3	120.3	122.2	122.7
Columbia	100.8	98.6	107.4	110.1	114.3	115.5	111.7	108.7
Brown	101.5	96.4	100.6	104.4	109.3	106.1	103.7	102.9
Rochester	106.8	105.0	111.0	114.5	117.1	118.9	125.3	114.0
MIT	105.3	104.3	111.8	114.5	120.0	125.0	120.4	119.8
Michigan	109.1	110.1	117.7	123.9	128.6	127.7	122.2	120.9
Wisconsin	98.5	99.3	110.0	115.2	121.4	123.7	119.8	118.6
California	97.0	92.1	106.6	113.0	122.1	125.7	117.3	120.4

SOURCE: Derived from Appendix Table A-1.

A second dimension in a comparison of faculty status involves the allocation of compensation between salary and fringe benefits, which is treated in more detail in the next section. Here it is only noted that Yale shifted from paying more of its faculty compensation in the form of untaxed fringe benefits than did the comparison universities in 1970/71, to paying substantially less than those eleven universities in 1977/78. Because the progressive structure of income taxes in nominal terms has not been fully adjusted by Congress to offset the effect of inflation, Yale faculty compensation after taxes has fallen even more rapidly relative to that received by faculty at these other institutions than the above comparisons based on pre-tax compensation would suggest.

A third aspect in a comparison of faculty compensation across universities is regional differences in the cost of living. Unfortunately there is no recognized consumer price index for the New Haven metropolitan area. As a working hypothesis one might use the Hartford index (102) and note that this is substantially less than that of New York (125), Boston (123), Princeton (New York estimate 125), or Palo Alto and Berkeley (San Francisco--Oakland 107).[4] It is less clear whether the cost of living is lower in New Haven than it is in Chicago (100), Ann Arbor (Detroit estimate 102), or Madison (Milwaukee estimate 106). Given the price of housing in New Haven alone, it seems likely that Yale salaries are not as uncompetitive at junior ranks as they might appear in Table 3.2, at least when compared with those at Harvard, MIT, Columbia, and Princeton. Further exploration of the relative price issue should be a subject for a full-scale faculty committee investigation, as well as a review of the value of university-subsidized housing commonly provided faculty at many other institutions, such as at Princeton.

Salary Structure

In contrast with public universities where salaries of all faculty and non-faculty personnel are public knowledge, Yale has adopted the policy of preserving the privacy of all salary information. But this reasonable policy can be carried to extremes of secrecy, which can foster fantasies and strengthen unfounded rumors. It is the Committee's view that more information about level and general structure of salaries at Yale is in the faculty's interest, but that

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4. Based on a price index of 100 for the average urban family of four persons consuming a middle-income (i.e., $20,000 per year)-basket of goods and services.

movement in this direction should be undertaken with considerable caution to maintain absolute individual privacy. If Yale is to pride itself on the best possible faculty given its resources, distinctions among faculty must be drawn according to their scholarly achievements, teaching abilities, and university and community service. Inevitably there will also be salary differentials among fields of study, which may be caused by the existence of alternative employment opportunities in different disciplines in government, research, and industry, and possibly by differentials in the overall quality and prestige of Yale faculty in each department or subfield.

The structure of faculty salaries is summarized here in two ways. First, Table 3.3 presents a tabulation of faculty salaries by rank and age. This table was prepared from the university's personnel file and is restricted to faculty in arts and sciences currently paid by Yale in part or in full as of January 1978. The figures are full-time, academic year (nine months) salary equivalents. The category "others" is just that; it includes all who are not classified in the four enumerated ladder ranks, such as acting assistant professors (working toward their Ph.D.s) and faculty holding visiting appointments and lecturerships. Our attention focuses on the three more homogeneous ladder ranks of assistant, associate, and full professors. Interpreting age as years since receipt of final degree or eliminating the handful of faculty without Ph.D.s or comparable degrees does not alter the reported patterns. Assistant professor salaries range from an average of $14,300 to one of $16,200, rising slowly with age, while associate professor salaries are also relatively invariant with respect to age around $19,000. The uniformity of junior salaries within departments by rank and duration of employment at Yale is a notable feature of Yale that discourages invidious comparisons at ages at which scholarly accomplishments and promise are particularly difficult to discern.

The salaries of full professors increase on average by 30 percent from $26,300 at age 35-39 to $34,300 at age 55-59, falling little thereafter.[5] In addition to any upward (or downward) shift in the level of faculty salaries

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5. Across the divisions the salary differences by age are not statistically significant, as shown below. This pattern of cross-sectional salary differences by age is similar to that observed in studies of academia and other skilled labor markets, though age-related differences are probably relatively smaller at Yale than elsewhere and do not decline at later ages as they do, on average, at other institutions.

Table 3.3

Average Academic Year Salary by Rank and Age,
for Yale Faculty in Arts and Sciences: January 1978
(in parentheses is the standard deviation of salaries
and in brackets the number of faculty in each age-rank group)

RANK	AGE									
	20-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	Total
Instructor	14222 (838) [9]	13714 (1035) [7]	NR [1]							[17]
Assistant Professor	14305 (955) [48]	15918 (1141) [143]	15827 (1425) [37]	16231 (1372) [8]	NR [1]					[237]
Associate Professor	NR [1]	19209 (2068) [27]	19292 (1185) [30]	18131 (5665) [13]	NR [2]	NR [3]	NR [3]	NR [4]		[88]
Full Professor	NR [1]	NR [4]	26304 (3103) [24]	28597 (3729) [34]	32239 (4682) [54]	32844 (4129) [64]	34282 (4214) [41]	33256 (3935) [43]	34311 (4808) [18]	[283]
Non-Ladder Appointments	12201 (2876) [62]	12719 (2977) [67]	14518 (4243) [17]	16894 (7365) [19]	20339 (7640) [20]	18325 (7155) [11]	24996 (12994) [13]	NR [4]	NR [5]	[218]
All Faculty	[121]	[248]	[109]	[74]	[77]	[78]	[57]	[51]	[23]	[838]

NR - not reported to preserve privacy for cells containing less than six faculty.

over time, as discussed in the previous section, most of the relative growth in full professor salaries occurs in the decade as they move from the age category 35-39 to age 45-49, when Table 3.3 implies that an additional 2 percent per year growth occurs. From age 45 to retirement there is little real growth in salaries, other than shifts in level (which were positive in the 1960s and negative in the 1970s).

The recent policy of distributing equal percentage salary increments to all faculty simply shifts up proportionately the age-salary profile, providing greater absolute benefit to those with greater initial salaries, and vice versa. This policy of equal proportionate salary increases is said to share equitably the hardship of hard times and the demoralizing effect of inflation, but is in fact a way of avoiding the discipline of making decisions. In the long run, hard choices must be made to maintain, rather than to dissipate, Yale's professional and instructional standing. Unless priorities are explicitly set and faculty are differentially rewarded according to merit, the point will soon be reached at which the loyalty and strong personal ties of faculty to Yale can no longer prevent the loss of our most highly valued colleagues. In addition to any pool set aside for equal percentage salary increments, it is essential that the Provost establish a pool of similar size for allocation to meet outside offers and retain widely recognized faculty talent as well as to reward the most outstanding scholarly accomplishments. Department chairmen should be required to make a special written justification for any claims they advance for a share of this merit pool to be given to members of their department. As evident from Table 3.2, it is particularly important that younger tenured faculty at Yale be able to expect on average, though according to their individual merit, the substantial salary increments that are traditionally associated with their age group, when productivity tends to be high and external professional reputations are being secured.

A second way to summarize the variation in faculty salaries is to fit the individual data by multiple regression to variables such as "years since receipt of final degree" that is called here, for short, "job experience." A standard form for such "earnings functions" used in labor economics, and, incidentally, endorsed by the AAUP for faculty salary comparisons,[6] is to express full-time salaries in proportional (logarithmic) terms, and introduce

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6. Elizabeth L. Scott, Higher Education Salary Evaluation Kit, American Association of University Professors, Washington, D.C., 1976.

age or our proxy for "job experience" in quadratic form to capture the inverted U shape of the cross-sectional relationship between earnings and duration of labor-market experience. Holding constant for "job experience" within ranks, as shown in the regressions in Table 3.4, additional variables are added to determine if they explain a statistically significant share of the unexplained variation in individual salaries around the average "experience" profile.

In the first three regressions within rank, four "divisional" distinctions are introduced: Foreign Languages, Humanities and English, Social Sciences, and Natural Sciences. The level of natural sciences is represented by the intercept term, and the other divisions are expressed as proportionate deviations from the salaries paid in the natural sciences. The divisional distinctions are not as a group statistically significant, except within the rank of assistant professors.[7] The natural sciences report that Yale's competitors offer higher salaries and that Yale of late has had growing difficulty in recruiting junior faculty; the sciences have therefore gained administrative acquiescence in increasing somewhat their junior faculty offers. The social sciences stand midway in this respect between the sciences and the humanities and foreign languages. The average assistant professor salaries in the sciences are about $650 higher than they are in the humanities. Although the reduced likelihood of receiving tenure at Yale appears to be the most commonly cited reason for Yale being unable to recruit the most promising junior faculty, the willingness of junior faculty to accept offers from Yale would undoubtedly increase if salaries were higher and flexibly determined to meet the competition in the field. The fourth regression combines all faculty in the Arts and Sciences, including 17 instructors, and imposes the restriction that the "job experience" and "divisional" differences are proportionately the same across ranks, though the level of each rank is allowed

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7. The joint F ratio test statistic for the four-way divisional distinctions is 5.53 with 3 and 229 degrees of freedom for assistant professors, which is statistically unlikely: it would not occur randomly one time in a hundred.

Table 3.4

Multiple Regressions on the Logarithm of Academic Year Salaries within and across ranks, January 1978

(The absolute value of t ratio is reported beneath regression coefficients in parentheses of joint F ratio and degrees of freedom)

	Assistant Professors (1)	Associate Professors (2)	Full Professors (3)	All Faculty** (4)
JOB EXPERIENCE				
Number of Years Since Received Degree	.0471	.0215	.0308	.0208
	(9.08)	(4.23)	(7.08)	(9.15)
(Number of Years Since Received Degree)^2 ÷100	-.273	-.0506	-.0447	-.0280
	(6.58)	(3.93)	(5.30)	(5.98)
DIVISION				
Natural Sciences	0	0	0	0
Foreign Language	-.0377	.0165	.0185	-.0086
Humanities and English	-.0406	.0073	.0336	.0041
Social Sciences	-.0129	.0491	.0512	.0273
	5.53 (3,229)	1.87 (3,75)	2.35 (3,274)	2.66 (3,604)
RANK				
Instructor				-.026
Assistant Professor				0
Associate Professor				.150
Full Professor				.506
INTERCEPT	9.50	9.70	9.89	9.53
	(565.)	(233.)	(186.)	(712.)
R^2	.3974	.2247	.3044	.920
Sample Size	(235)	(81)	(280)	(613)**
Standard Error of Estimate	.0648	.0715	.128	.105

*The intercept represents the level of salaries for natural science assistant professors (the suppressed categories of division and rank), and the division and rank coefficients estimate relative deviations in salaries from this category.

**Includes in addition to three ranks of professors, 17 instructors. The sample of instructors was not of sufficient size to warrant separate regressions within that rank.

to differ.[8]

In another set of regressions (Appendix Table A.5), a variable for the sex of the individual faculty member is included to determine if women receive proportionately more or less salary than do men with the same years of "job experience" and divisional affiliation. The estimates suggest women receive on average 0.3 percent less at the assistant professor level, 1.5 percent more at the associate professor level, and 1.2 percent less at the full professor level. None of these salary differences between men and women, however, are statistically or quantitatively important.[9]

From these comparisons, faculty salaries at Yale appear to differ little by sex and by division. The average variation (i.e., standard deviation) of individual salaries around the fitted regression line is 6 to 13 percent, increasing with rank. To know whether this is relatively large or small, one would need to perform a similar exercise at other universities, which, to our knowledge, has not been done.

Finally, in Table 3.5 it is informative to contrast the way in which Yale faculty salary differentials by rank have changed over time. The Yale chapter of the AAUP undertook an analysis of Yale faculty salaries in 1928 which provides some early data to compare with the recent past. Professorial salaries today at Yale are only 20 percent higher than they were in 1913 in real terms (column 2). Though the early study does not disaggregate assistant and associate professors, as a group they were paid some 55 percent as much as the average Yale professor at that time. Combining these two ranks in 1977/78, one obtains an average salary equal to 53 percent of that paid to professors in 1977/78. Instructors have diminished sharply as a proportion of the Yale faculty and are today concentrated in relatively few fields. But even here the change in their salary relative to that of professors from 1927/28 to

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8. Here assistant professors in the natural sciences are implicitly measured by the level of the intercept, and a combination of "division" and "rank" proportionate effects (i.e., regression coefficients) approximate the salary for other groups. For example, the average associate professor in the social science department receives 17.7 percent (i.e., .0273 + .150 in regression 4) more than an average assistant professor in the natural sciences with the same number of years "job experience." The actual salary with, say, ten years experience is obtained by evaluating the regression and taking its antilog, $19,679; i.e., exp (9.53 + .150 + .0273 + .0208*10 - .028*1.0).

9. None are significant at the 50 percent (2 tail t test) level of confidence. In other words, the differences noted here could have occurred even among random assignments (unrelated to sex).

Table 3.5

Yale Faculty Salary by Rank: 1913-1978

(Where available the number of Yale faculty by rank is reported in parentheses beneath the salary data.)

	Professors' Academic Year Salary		Proportion of Professor's Salary		
	Current Academic Year Salary	1967 dollars	Associates	Assistants	Instructors
1913/14	4440	14,850	.539		.208
1918/19	4291 (61)	8,847	.543 (63)		.308 (45)
1920/21	6014	10,587	.584		.386
1927/28	6502 (81)	12,577	.582 (110)		.346 (103)
1963/64	16,070	17,525	.641	.474	n.a.
1966/67	18,790	19,331	.633	.474	n.a.
1970/71	24,760 (348)	21,290	.601 (151)	.456 (271)	.406 (31)
1974/75	27,900 (335)	18,890	.602 (153)	.448 (205)	.391 (36)
1977/78	32,300 (335)	17,796	.635 (122)	.476 (250)	.401 (35)

Sources: Current Salary 1913-1927, Incomes and Living Costs of a University Faculty, (eds.) Y. Henderson and M.R. Davie, New Haven, Ct., Yale University Press, 1928, Table VI, p. 27.

1963-1966, AAUP records

1970-1977, Table A-4, AAUP sources

1977/78 is moderate, rising from .35 to .41. The big increase in instructor salaries relative to those of professors occurred from 1913 to 1920, going from .21 to .39. In general the relative levels of Yale faculty salaries by rank have changed remarkably little, and adjusted for inflation the real salary levels (column 2) have increased very slowly, even when compared with the increase in the national average of academic salaries.[10]

Conclusions

In less than a decade, Yale faculty compensation has decreased by more than a seventh in real purchasing power. This decline has been slightly greater for full and assistant professors than for associate professors. This period since 1970/71 has been one of generally eroding academic salaries throughout the nation. Given existing demographic and enrollment trends, the relative economic status of faculty of Yale and elsewhere is likely to continue to decline for the next ten to twenty years. Other major universities with whom Yale competes for faculty have encountered the same financial problems that Yale has, though the nature of the problems differs somewhat in private and in public universities. Although Yale experimented with retrenchments in expenditures and reduced the number of Yale faculty in the early 1970's by 10 percent, the administration lapsed into its former ways after 1974/75, contributing to the current financial deficits. Most other schools began making adjustments at the end of the 1960's and have continued through the 1970's to consolidate their retrenchments in faculty numbers and programs. On average, these other universities (Table 3.1) report faculty compensation declines that are less than half those sustained by Yale faculty, in real terms. If 1970/71 were taken as a year of parity that Yale would like to regain, large increases in compensation are required, on the order of 10 percent at every rank relative to other major universities.

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10. From 1914 to 1975, Bowen estimates that the average real faculty compensation in the United States increased in 1967 dollars from $5574 to $11,500, more than doubling, while Yale salaries grew about a quarter. See Appendix Table A.1 and Table 3.5.

One outstanding example of Yale's early effort to economize was the redesign of the faculty pension program, which has led to a sharp decline in the proportion of faculty fringe benefits. The next section shows how Yale's policy on faculty pensions and fringe benefits has deviated dramatically from that followed elsewhere, and indeed this one policy can account arithmetically for most of the relative deterioration in Yale's faculty compensation package. But to reinstate and improve faculty fringe benefits will require additional university resources or fewer faculty. Although federal wage and salary guidelines have set a 7 percent ceiling on increments to salaries, the limit is not presently considered applicable to fringe benefits. Prospects for improving fringe benefits are briefly explored in subsequent sections of this report.

4. Yale Faculty Fringe Benefits and Retirement Policy

This section first reviews the evidence on the composition and level of Yale faculty fringe benefits, and their relation to those offered at other schools. In light of these facts and recent changes in social security and pension laws, the report then develops a recommendation on how resources available for faculty compensation might be better proportioned between salary and fringe benefits to meet the interests of Yale faculty. A concluding section discusses the way new federal and state retirement legislation may affect Yale and spur additional changes in pension and benefit policy. The issues treated here are technical and of great importance to faculty status. It is, therefore, essential that the faculty appoint a standing committee whose members serve terms of several years to facilitate continuity and the accumulation of expertise. The committee's function would be to evaluate the entire faculty fringe-benefit package, monitor changes, and evaluate plans and options as presented to it in the form of position papers prepared by the Personnel office and the Financial Vice President. The committee would then be expected to report its recommendations to both the faculty and the Provost.

The major rationale for fringe benefits is one of allowing recipients of university compensation to avoid taxes while providing them with the most value from their university compensation. Direct employer payments for fringe benefits allow faculty to avoid payment of income taxes or delay such taxes on annuities, permitting in the latter case the full untaxed amount to earn returns until they are liguidated or cashed upon retirement. This means of payment rather than salary is likely to appeal to persons in higher marginal income-tax brackets for whom the fringe-benefit payment is equivalent to more pretax salary from the university. But fringes are also attractive to persons who are more inclined to purchase the service toward which the university contributes all or a share of the costs. The best and most equitable fringe benefit scheme is, therefore, one that provides services that all faculty would want to purchase in the absence of the program. Since this ideal cannot often be achieved, it is desirable to provide participants with flexible arrangements that can transfer similar amounts of resources to participants and nonparticipants alike. Finally, since fringe benefits are a creature of the legal tax system, and hence heavily regulated, there are many technical limitations and aspects to most fringe benefit plans and proposals that require technical scrutiny. The recommendations later should be viewed, there-

fore, as only a starting point for fashioning an improved faculty fringe-benefit package at Yale.

The Level and Composition of Yale Fringe Benefits

The cost to the university of the fringe benefits paid to Yale faculty today represents a markedly smaller percentage of faculty salary than it does at many other major universities. Table 4.1 reports that fringe benefits in 1977/78 were 12, 14, and 15 percent of salaries for assistant, associate, and full professors at Yale, respectively. The faculty-weighted average in that year at Harvard, Chicago, Stanford, Columbia, Michigan, and Wisconsin was 19 percent at all ranks. But Yale has not traditionally held back on fringe benefits, indeed, until 1970/71 Yale was noticeably more generous in providing fringe benefits to their faculty than the average of the above group of six universities, even though certain universities such as Harvard have always provided handsomer fringe benefits to their faculty than has Yale. The change in Yale policy had taken effect by 1974/75 when a revision in Yale's contribution to the pension plan had sharply reduced the TIAA/CREF component of fringe benefits, while the real value of other fringe benefits was allowed to erode before inflation, such as the faculty children's college tuition "scholarships."

The committee could discover no persuasive reason why Yale should be shifting its faculty compensation package toward salary at the expense of fringe-benefit contributions. The prima facie evidence that other public and private universities have been proceeding in the opposite direction confirms this sense that Yale's decision in the last decade was not designed with faculty interests in mind. From the point of view of taxes, in 1966/67 professors at Yale received an average academic-year salary of $18,790. If for that year their other income exactly offset their tax deductions and they filed a joint return, they would have then paid 21.5 percent of their Yale salary in taxes to the Internal Revenue Service, and the marginal dollar that they might have considered reallocating to a tax-sheltered fringe benefit was taxed at a 28 percent rate. By 1970/71 the average full professor salary was $24,700, the average tax 23.9 percent, and the marginal tax-take from salary that might have been allocated to fringe benefits, 36 percent. By 1977/78, when Yale professorial salaries had risen to $32,300, the same exercise suggests an average tax in 1978 of 23.8 percent, and the marginal tax rate even higher at 39 percent. Performing the same exercise for the average associate professor at Yale in 1977/78, the tax rate on the last dollar of

TABLE 4.1

Faculty Fringe Benefits As Percentage Of Salaries At Yale And Comparison Schools, 1963/64 To 1977/78

	Yale	Harvard	Chicago	Stanford	Columbia	Michigan	Wisconsin	Weighted Average Of Six*
1963/64								
Professor	13.6			NOT AVAILABLE BY				12.1
Associate	14.2			INDIVIDUAL SCHOOL				11.1
Assistant	13.9							11.5
1966/67								
Professor	13.8			NOT AVAILABLE BY				13.6
Associate	14.2			INDIVIDUAL SCHOOL				13.1
Assistant	14.8							13.6
1970/71								
Professor	15.2	19.3	14.3	15.9	17.9	15.3	9.7	14.9
Associate	16.9	20.8	14.4	16.2	15.6	16.4	10.6	14.3
Assistant	17.0	21.2	14.5	16.1	14.7	17.3	11.2	14.5
1974/75								
Professor	14.8	20.9	17.0	17.8	20.0	16.5	17.8	18.1
Associate	13.5	14.0	17.0	18.0	17.6	18.2	19.7	17.9
Assistant	11.8	14.0	17.0	19.8	16.1	19.4	20.8	18.2
1977/78								
Professor	14.9	21.4	18.1	18.6	22.5	17.8	19.4	19.4
Associate	13.7	13.9	18.1	19.2	17.4	20.2	21.9	19.4
Assistant	11.7	14.4	18.3	20.5	14.7	22.4	22.9	19.3

*Weighted by number of faculty by rank from 1970/71 to 1977/78. Earlier figures weighted by AAUP.

Sources: 1963/64, 1966/67: AAUP files
1970/71-1977/78: AAUP,-published data ,Table A-4.

salary that might be reallocated to untaxed fringe benefits was 28 percent and the marginal tax rate for assistant professors,25 percent. Although Yale faculty salaries have not increased in real terms since 1970/71, the tax rate has continued to rise, and the tax incentive for university compensation of professors in the form of fringe benefits has increased at least a third since 1966 and a tenth since 1970. The tax-inducement to shift compensation toward untaxed fringe benefits is distinctly less for assistant and associate professors, 36 and 28 percent less* respectively. The structure and trend in U.S. taxation, therefore, confirm the appropriateness of fringe benefits increasing as a percentage of salary, and suggest that assistant and associate professors might prefer to have a somewhat smaller fraction of their compensation in the form of fringe benefits than would professors.

The Retirement Pension Plan

There have also been several changes in federal law that have altered substantially the appropriate design of a pension plan at Yale. First, the recent sharp escalation of the salary base from which Social Security (FICA) payments are deducted (and matched by the university) has automatically decoupled the Yale faculty pension plan from a formula based on faculty voluntarily contributing 2.5 percent of their salary below the FICA base ceiling and 5 percent above the ceiling to their regular tax-sheltered TIAA/CREF retirement annuity account. Until July 1, 1979, the university contributes twice the amount that faculty contributes, or 5 percent of the faculty's salary below the FICA ceiling and 10 percent of the faculty's salary above the ceiling. Under the old Social Security system the FICA wage base was legislated to increase annually at the rate of wages in the private U.S. economy. As noted in section 2, faculty salaries at Yale and elsewhere increased more rapidly than that of the average worker during the 1950s and 1960s. When the Yale pension plan was tied to the FICA wage ceiling, the new two-rate pension formula may have appeared to be a reasonable way to index university contributions to pensions in order to keep the proportion of pension to salary approximately constant over long periods of moderate inflation. But as shown earlier, faculty salaries have fallen relative to those of the average U.S. worker, and that deterioration is likely to continue given the lack of expansion in higher education anticipated for the next two decades. Thus, in 1966 the FICA base was $6,600, or 35 percent of the average full professor salary at Yale, and by 1970/71 when the FICA base

*The difference between professor and assistant professor marginal tax rates is 14%, which is 36% of the former's marginal tax rate; similarly, the 11% difference between professor and associate professor marginal tax rates is 28%.

was $7800 and salaries $24,700, the base had fallen to 32 percent. But the unanticipated decline in faculty salaries relative to the national average led to the FICA base being increased to $17,700 in 1978, 55 percent of the average Yale full professor's salary of $32,300. Based on the current pension formula, the university contribution to faculty pension plans as a percentage of their salary fell 14 percent for full professors,from 8.42 percent in 1970/71 to 7.26 percent in 1977/78. The decline for associate professors was 22 percent, from 7.38 to 5.68 percent, and for assistant professors, 24 percent, from 6.55 to 5.00 percent, in this same period. Clearly, the two-rate formula, rather than preserving the university contribution to the pension plan at a constant percentage of faculty salaries, has allowed the university contribution to decline sharply, particularly for younger faculty whose salaries have been overtaken by the FICA national wage base.

Because the U.S. Congress accelerated the growth in the FICA wage base last year, the Yale pension plan decouples its two-rate structure from the FICA base as of July 1, 1979 in 1979. Unless changes are immediately achieved by the faculty, in 1979,1980, and 1981 Yale's pension contributions are likely to be tied to the national private economy's wage level, as they were implicitly in the past.[1] The committee approves of the idea of indexing fringe benefits at Yale to assure that an approximately constant fraction of compensation is allocated to fringe benefits, regardless of inflation or academic salary cycles. Therefore, we recommend that the idea of the two-rate pension formula be preserved but indexed directly to the average level of salaries of Yale full professors, as reported annually to AAUP (HEGIS Survey).

The choice of the level at which to start the index should not be based on the current untenably low level, but must return to the historic levels before the current deterioration set in. The committee recommends that faculty salary below one-third the level of last year's average for full professors be matched by a university contribution of 5.0 percent, and above that level, salary should be matched at the 10.0 percent rate. With this one third parity level that was approximated in 1970/71, the contribution of the university to the fringe benefits of an assistant, associate, and full professor receiving the average 1977/78 salary of their rank would have been equal to 6.50, 7.37, and 8.22 percent of salaries at the respective ranks.

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1. As indicated in a letter from Provost and Acting President Hanna H. Gray to AAUP President Isidore Dyen on April 12, 1978.

This change would both raise the overall level of university contributions to pensions and close the differential between ranks, without denying the fact that, given the progressive structure of taxes and the increasing propensity to save for retirement at older ages, the pension component of fringe benefits should increase with increases in rank.

Another set of legislative changes in pension policy was embodied in the Keogh (H.R. 10) bill and the Employment Retirement Income Security Act (ERIS), which permit individuals to purchase tax-sheltered retirement annuities with a specified share of their personal earnings. The rationale for a participation formula that applies uniformly to all faculty, such as is provided under the traditional Yale TIAA/CREF matching plans, has been changed by these new legal options through which workers can purchase and sell tax-sheltered annuities. With the passage of ERIS in 1974, TIAA/CREF promptly fashioned a new program exploiting these options and called it a Supplementary Retirement Annuity (SRA) plan. In January 1978 it was finally made available by the Personnel office to Yale faculty. The SRA provides individuals with more liquidity but the same tax-deferred features, for the annuity can be cashed in whole or in part as the owner desires, such as in the purchase of a home or the occurrence of some unanticipated financial crisis or opportunity. Thus, though there is a fee for cashing out of the SRA, for many younger faculty, who must sometimes meet heavy immediate financial commitments in addition to planning for retirement, the gain in liquidity might appear to offset the cost. Also, the traditional TIAA/CREF retirement plan allows for a restricted number of rigid payout options that must be determined at retirement, or, in event of death, by the beneficiary at the time of his inheritance. In sum, the SRA has much to recommend it over the conventional retirement annuity toward which university pension contributions are currently paid. There is a strong case then to permit faculty to allocate their tax-deferred annuity contributions (and those of the university) into either SRA or the conventional retirement plan offered by TIAA/CREF.[2]

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2. Given the paternalism of the university toward its faculty, it may seem appropriate to assure that all faculty upon retirement from Yale have a reasonable means of support. At the cost of limiting individual opportunities, Yale might still seek to encourage faculty to participate in the conventional retirement plan after a certain age, and thus not permit them to liquidate their SRA before retirement and thus be improverished upon departure from Yale. We think that the vast majority of Yale tenured faculty are capable of financially planning for their retirement. Yale should probably provide financial counseling services to help faculty in planning for their retirement,

The adequacy of the current two-rate pension structure for the future depends on many additional financial assumptions and calculations which the committee did not feel itself competent to make. In determining what should be the appropriate overall level of university and faculty contributions to tax-deferred annuities at Yale, one must perform a complex calculation, based on assumptions regarding (1) the real (after adjustment for inflation) rate of return that can be expected from tax-deferred annuities, (2) the real rate of growth in faculty salaries over their (remaining) life cycle, and (3) a "respectable" target level of retirement income relative to that earned in the decade before retirement. The probable level of Social Security payments in the future must also be taken into account as a supplemental source of the retirement income target. The committee inquired among appropriate offices in the university to determine if such projections had been performed as a basis for evaluating the adequacy of the pension plan, and obtained only the calculations reported in Table 4.2 that illustrate how poorly pension annuities have performed in the last four years as compared with the returns envisioned in the 1974 (Cooper) revision. It should be said in all fairness, however, that other pension plans proceeded under assumptions that were similar to those embodied in the Cooper revision of Yale pensions. The last four years are an unreasonably pessimistic period within which to measure future annuity returns for the purposes of selecting an appropriate pension scheme.

We would urge that the administration prepare such a planning document immediately, based on a tenable range of these assumptions. As a starting point, we would propose that the exercise be performed on the basis of (1) a two-percent real rate of return on tax-deferred annuities, (2) a one-percent real rate of growth in faculty life-cycle salaries, and (3) a retirement income equal to 50 percent of the level of salaries in the preretirement decade (Table 4.2). A determination of the "best" set of assumptions will require informed discussion within the entire faculty, but clearly, as shown in Table 4.3, Yale is contributing much less than other schools to their faculty pensions, and Yale requires an unnecessary matching of funds by faculty to obtain the university's contribution.

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but Yale ought not to presume that a rigid uniform rule for forced savings into an illiquid fund is superior to leaving individuals with the choice of how much to save and how to hold their savings. Such paternalism is no longer appropriate.

Table 4.2

Assumptions Underlying Pension Plan Projections

Assumption	Cooper Memo Revising Pension Plan 1974 (1)	Actual 1973/74 1977/79 (2)	Committee's Recommended Assumption Range (3)
1. Real Return on			
Bond & Mortgages (%)	2.75%	1%	2%
Stocks (%)	4.50%	-10%	(0-3)
2. Real Growth of Salaries of Faculty per year	2.9%	0^{+}_{-}	1% (0-2)
3. Target Retirement Income as Percentage of Salary in Preretirement Decade			
(a) If TIAA	47%	34%	50%
(b) If CREF	53%	7%	(40-60)

Note: The object of exercise is to determine pension contribution rates in order to achieve target retirement incomes.

Source: W.D. Stubbs,"Pension Studies, An Examination of the Acturial Assumptions Used in the Cooper Memorandum in Yale's TIAA/CREF Plan,"22 March 1978.

Table 4.3

TIAA/CREF at other Institutions

University	University Contribution	Individual Contribution
Stanford	10%	Mandatory. May elect 5% (deduction) or 6% or more (reduction)
Princeton	9% below FICA 15% above	None
Harvard		
under age 40	5% below FICA 10% above	None
age 40 and over	11% below FICA 16% above	None
Columbia		
under age 40	5% below FICA 10% above	None required. May contribute supplement to University's % up to a combined total of 22%
age 40 and over with 5 year's service or tenure	10% below FICA 15% above	None required. May contribute supplement to University's % up to a combined total of 22%
age 55 and over with 15 years of service	15% below FICA 20% above	None required. May contribute supplement to University's % up to a combined total of 22%
MIT		
private plan	10%	5% Works like TIAA - Available upon appointment. Mandatory after 5 yrs. Vesting is 50% of MIT contribution for first 5 yrs.
Yale	5.0% below FICA* 10.0% above FICA*	2.5% required matching. 5.0% required matching. May contribute supplement to combined total up to 22%

* Growing at national wage level after July 1, 1979 from 1978 base of $17,700.

Source: W.D. Stubbs, "Pension Studies, An Examination of the Acturial Assumptions Used in the Cooper Memorandum in Yale's TIAA/CREF Plan," 22 March 1978.

Structure of Fringe Benefits by Faculty Rank

Table 4.4 reports in the upper panel the 1977/78 salary and fringe benefits of faculty at Yale grouped within five ranks. In the lower panel the total of fringe benefits within ranks is allocated by percent among several categories. Social Security and Workmen's Compensation are required by law, and hence are not the object of further attention here. In parentheses beneath each percentage share, the number of faculty participants in the program is noted. Virtually all, or 98 percent, of full professors participate in the TIAA/CREF retirement plan. As noted earlier there are several reasons for this: they are closer to their lifetime peak incomes and hence incur relatively high taxes, saving for retirement has more immediacy, and they have absolutely (though not relatively) more to gain by matching the university contributions. Among associate professors, 84 percent participate in the retirement plan, while only 52 percent of assistant professors find it in their interest to participate in Yale's current retirement plan. The tax incentives are fewer for the younger faculty and their salaries relative to their anticipated future incomes are sufficiently low that they apparently prefer to use their potential contribution for current consumption, acquisition of consumer durables, or more liquid savings, and thus forego the university contribution.

The most evident inequity in the current pension system affects assistant professors, half of whom do not find the two-for-one matching by the university a sufficient inducement for them to defer 2 1/2 percent of their salary. Their failure to avail themselves of this option also helps to explain why the fraction of fringe benefits of salaries is so low for assistant professors. If they participated in 1977/78 at the same rate as did full professors, their fringe benefits would have been 14.4, or at about the same level as that of full professors, rather than the actual 12 percent of salaries (Table 4.4).

To eliminate this inequity and make Yale salary and benefits more attractive to faculty, particularly younger faculty, individual contributions and those of Yale should be allocatable to either the traditional TIAA/CREF retirement plan or the more flexible SRA plan.[3] This would of course impose additional costs on Yale insofar as the university would have to match the "contributions" of faculty who currently are not participating in the traditional TIAA/CREF retirement plan. Rough calculations, based on the assumption that nonparticipants would receive the same amount from Yale as do the current

3. Since the SRA plan will have a cash value, it only seems reasonable at this time to allow faculty the additional option of receiving their contribution and Yale's matching contribution as cash.

Table 4-4

Average Nine-Month Salary and Fringe Benefits and their composition by faculty rank: 1977-1978 (excluding Schools of Medicine and Nursing)

	Lecturers & Convertible*	Instructors	Assistant Professors	Associate Professors	Professors
Number	37	35	250	122	355
Salary ($)	14,187	12,943	15,356	20,541	32,308
Fringe ($)	1,379	1,079	1,841	2,751	4,770
Fringe (%)	9.72	8.34	11.99	13.39	14.76
	PERCENTAGE SHARE OF FRINGE BENEFIT (number of faculty receiving particular benefit)				
Retirement Plan - TIAA/CREF	15.5 (8)	-	22.6 (131)	37.3 (103)	50.8 (348)
Medical Plans	20.7 (25)	24.5 (24)	23.3 (225)	17.5 (113)	11.1 (327)
Disability Insurance	1.2 (10)	-	1.6 (125)	2.4 (122)	1.4 (348)
Tuition Scholarships	-	-	-	2.3 (5)	10.2 (103)
Group Life Insurance	2.9 (8)	3.3 (6)	2.5 (53)	4.2 (60)	5.1 (297)
Workmen's Compensation	1.7 (35)	2.0 (35)	1.4 (250)	1.2 (122)	1.2 (355)
Social Security	57.9 (35)	70.2 (35)	48.6 (250)	35.1 (122)	20.2 (355)

*Includes convertible appointments to assistant professor from acting lecturer or acting instructor.

Source: Higher Education General Information Survey (comparable to AAUP data from previous years), obtained from the Treasure's Office.

participants (Table 4.4), yield an estimate that such an indidualized benefit plan would increase university outlays by about $135,600 more than the current overall benefit level for ladder faculty of $2,489,458, an increase of only 5.4 percent. This increase in university cost could be reduced or gradually phased in by offering the SRA cash benefit option only to new faculty appointments at the assistant professor level. This policy approach would cost the university only $16,000 in the first year, and would increase by that amount for about the next six to ten years. Other schemes can be imagined that would also slowly phase in the new individualized benefit program to avoid an abrupt rise in university costs. The important result of such a change is that Yale's appointment offers, particularly at the junior faculty level, might be more attractive to potential faculty and more competitive. The resources that Yale is currently channeling into forced savings by its younger faculty might thus find their way to more highly valued uses, and even tenured faculty are likely to prefer occasionally a reallocation of their savings portfolio in order to hold more of their assets in the more liquid SRA. The lack of a responsive adjustment of the faculty pension system to the opportunities afforded by the new laws suggests again the need for a permanent specialized faculty committee to oversee fringe benefit policy at Yale.

Medical Plans

The second largest voluntary fringe benefits are the medical plans and associated insurance schemes, which have steadily increased in recent years as a fraction of faculty salary. Three options exist: Yale Health Plan (YHP), Blue Cross/Connecticut Medical Service, and Community Health Care Plan. To these medical and hospital coverages can be added Major Medical Insurance which takes over when regular health coverages are exhausted. A separate faculty committee has evaluated the Yale Health Plan, the major provider of health care to the faculty.[4] Given the steadily rising cost of this service, however, continuing review of the YHP by faculty committees is mandatory. Nonfaculty staff and students at Yale receive their medical coverage entirely at Yale's expense and they cannot be expected to resist escalating costs. It will thus fall to faculty initiative to keep the costs of the Health Program under control and restrict the provision of services to those most essential to the university community, scrutinizing with particular care costly student

4. Yale University Health Service Committee Report, July 15, 1976.

mental health programs.[5]

Though it is beyond the scope of this committee to evaluate the efficiency and adequacy of the basic health care coverages subsidized by Yale for its faculty, one thing is clear: the Major Medical Insurance plan for faculty is very poorly designed. Major Medical insurance pays 80 percent, up to a maximum of $15,000 per illness or accident for each family member. Given the cost and complexity of modern medical treatment, this ceiling of coverage is woefully inadequate. A much higher limit would add little to the cost of such a policy that currently costs faculty $3.60 a month and that in 1975/76 required an overall contribution from the university of only $120,000, which constituted only .1 percent of overall faculty salaries. This is in contrast to the university contribution of $2.53 million, or 2.2 percent of faculty salaries, to the three basic medical coverage plans. Perhaps because of the activities of unions in guiding the improvement of fringe benefits for nonfaculty staff at Yale, Major Medical insurance for nonfaculty staff was changed last year to provide coverage with a million-dollar ceiling. Such a revision in faculty Major Medical coverage would seem long overdue.

Faculty Children's Scholarship Plan

Since 1971 the children of senior faculty and staff, and of junior faculty and staff after six years' employment at Yale, have qualified for college tuition grants of up to $1500 a year for each child. In 1971 this sum amounted to 52 percent of the annual tuition then being charged by Yale College. In 1978/79 it will probably represent less than 30 percent of the Yale College tuition (as opposed to the inclusive fee). The Internal Revenue Service, after some waffling, reaffirmed again last year that these "scholarships" were to continue to retain their tax exempt status. At many universities such grants are established in relationship to the granting institution's own tuition charges rather than fixed as set monetary amounts. According to our information, Brown, Brandeis, Chicago, New York University, Duke, and Pennsylvania award such grants to the full amount of their own tuition, while Stanford grants a sum amounting to half of its tuition and Columbia, Dartmouth and

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5. Costs of the YHP are assumed to be the same for all participants, whereas studies of other prepaid health plans with no user fees find that the services of the plan are used more extensively by persons with lower wages or for whom the value of their time is generally lower. We suspect, therefore, that nonfaculty staff at Yale and students are heavier users of YHP than faculty, and the institution of moderate user fees would reduce costs substantially without noticeably reducing faculty benefits from YHP. They might indeed increase, with less time spent waiting for services.

Table 4.5

Percentage of Faculty, Administration and Professional Staff Fringe Benefits Charged to Grants and Contracts: 1975-76

Cost Elements	Yale	Brown	Columbia	Dartmouth	Pennsylvania (faculty only)	Rochester
Retirement						
TIAA/CREF	7.20	10.80	10.85	11.58	5.68	10.02
Social Security	3.40	4.30	3.51	4.38	3.58	3.85
Insurance						
Health	2.20	-	2.14	-	2.38	1.38
Major Medical	.10	.10	.27	.32	.24	.15
Disability and Travel	.20	.50	-	.37	.03	.14
Life	.50	.50	.03	.31	.05	.86
Unemployment	-	.40	.59	.03	-	.06
Workmen's Compensation	.10	-	.14	.06	.03	.20
Tuition	.80	4.30	2.36	2.41	7.60	1.39
Subtotal	14.50	20.90	19.89	19.46	19.59	18.05
Other						
Sabbatical	4.80	4.50	-	-	2.06	-
Severance	-	-	.11	-	-	-
Health Service	-	-	-	-	-	.14
Carry forward*	3.00	-	-	.94	2.91	-
Total Rate	22.30	25.40	20.00	20.40	24.56	18.19

Source: Little Ten Survey, 4/6/76, obtained from the Provost's Office.

Rochester allocate larger sums than does Yale (Table 4.5). Harvard and Princeton, on the other hand, have ceased or are phasing out such tuition grants, and Harvard has substituted a subsidized tuition loan program for dependent children of faculty.

The question the committee could not answer unanimously is whether this is the best way to use faculty compensation funds. In one sense such a program is inequitable, rewarding married faculty roughly in proportion to their decisions about family size. To lessen this distortion in benefits, a ceiling might be imposed on educational benefits after three children, and other forms of fringe benefits might be entertained that would appeal to single faculty. Also as currently administered, about half of the "scholarships" are awarded to the children of nonfaculty staff.[6] Since nonfaculty staff already receive larger fringe benefits in proportion to salary than do faculty, notably in terms of their pension plan and total coverage of health insurances, it may make sense for this fringe benefit program to be redesigned in favor of faculty. Any future plan to increase the "scholarhsip" plan might be directed only to faculty children, leaving the current level for staff constant. A subsidized loan program to help faculty meet the expenses of educating their children might also be desirable.

The arguments in favor of increasing the size of the tuition grants are nonetheless persuasive. First, it is an equitable benefit to the extent that faculty members have about the same number of children, and securing a college education for one's children remains a major financial burden for all but the independently wealthy. A scholarship program provides a large and specific fringe benefit aimed at the middle-aged tenured faculty, a group from which Yale is constantly recruiting their most distinguished senior faculty. Stories are quite common of faculty members with several children approaching college age either being immobilized at a lesser school that offers such a full tuition program, or being recruited to one that provides full tuition grants for faculty children.[7] Tuition grants appear to be a reasonably focused fringe

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6. Fifty-five percent went to faculty, 28 percent to managerial and professional, 10 percent to clerical and technical staff and 7 percent to weekly employees.

7. For example, after a lengthy search, a Yale department proposed a full professor from another university for a vacant position. Although he was offered a very sizeable increase in salary, he declined on economic grounds, more specifically, because of Yale's current policy on college scholarships

benefit that might help considerably in recruiting the most promising young professors to Yale in the years ahead. The committe recommends that the faculty portion of the "scholarship plan" be at least indexed, and remain in future years no less than 30 percent of Yale College's tuition. The faculty as a whole may wish to record its preferences on whether this fringe benefit should be increased to regain its purchasing power as of 1971 and be indexed at 52 percent of Yale College tuition. Such a decision might be recommended, but phased in slowly, given the associated additional costs.

Group Life Insurance

Faculty receive $3000 token coverage at university expense. Beyond this amount coverage is available in a fixed proportion to Yale salary. Though the plan is advertised as subsidized by university contributions, it is reported by some to be a self-financing program with Yale absorbing only unusual swings in losses, but not on balance making a contribution. Cost comparisons of life insurance policies is a subtle art, but the price of roughly comparable TIAA/CREF policies is distinctly lower than that of Yale policies. Moreover, prices increase with age much less rapidly than do actuarial mortality risks, with the effect that insurees under the age of 40 subsidize those over the age of 40. Again, if the provision of life insurance is intended to help faculty protect their families from financial distress in the event of their death before their TIAA/CREF pension has accumulated, it would seem that policies should be directed to encourage the purchase of coverage by younger faculty, rather than used to subsidize older faculty who already possess substantial pension rights. A reevaluation of the need for and objectives of the group life insurance program is warranted. The committee would also urge the Personnel office to prepare an intelligible explanation regarding the provisions of the program and Yale's actual contribution to it.

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for faculty children. His home university provides annual scholarships for each faculty child up to the amount of its full tuition charge. The resulting differential in scholarship aid, taking into account its tax-free status, would in the judgment of the professor in question, have more than offset the considerably larger salary offered by Yale, which would be subject to a high rate of income tax. He would have come to Yale at a salary seven thousand dollars less than he was offered if Yale's current scholarship aid had amounted to $3,500 per child per year rather than the $1,500 at which it has been frozen since 1971.

Miscellany of Fringe Benefits

There are many other minor fringe benefits, such as a Travel Accident Insurance program that pays up to $1000,000 for accidental death or dismemberment while traveling on Yale business, a program which costs the university very little. The Disability Insurance is said to have been improved in 1976, but the vague language concerning what constitutes disability (preventing one from holding one's current job or any job) in relation to holding a faculty appointment is disconcerting. Legal counsel is required to evaluate the adequacy of this program's coverage.

In recent years many minor fringe benefits have also disappeared or diminished. Though we do not always subscribe to the view that each and every service provided by Yale to its faculty should be subsidized, each change, nonetheless, plays a small part in the diminished economic status of the faculty. For example, parking fees have increased for senior faculty from $30 per year in 1969/70 to $156 in 1978/79, while for junior faculty they have risen from $20 to $123 per year. Gymnasium fees (with towel service) have increased for faculty and staff from $20 in 1971/72 to $60 in the current year. Traditionally, the university has contributed to the transportation expenses of faculty participating in professional meetings. The 1966 Faculty Handbook sets a maximum of $300 for this obligation of the university to all full-time faculty at the rank of instructor or higher. This ceiling remains unchanged thirteen years later, despite the much greater cost of travel, hotels and subsistence. Yale's scholarly reputation and the professional growth of its faculty, particularly junior faculty, would be enhanced if this level of travel support were indexed in the future to increase with the consumer price index. Moreover, it should not be restricted solely to transportation costs, but should be broadened to include all receipted travel and subsistence expenses incurred in the participation of professionally recognized meetings.

Faculty Leave Policy

Leave policy is very important to the status of most faculty. The opportunity to take time off from teaching and other academic related activities in order to undertake research and explore new subjects is crucial for the scholarly development and professional advancement of both junior and senior faculty. The magnitude of this fringe benefit is seen at the bottom of Table 4.5, which contrasts Yale with five other universities in which fringe benefits are reckoned for the purpose of justifying federal grant and contract support.

The significant difference between the fringe benefit rate for Yale reported in this tabulation for 1975/76 and that reported earlier from the AAUP records is the inclusion here of sabbatical leaves.[8] The last "carry forward" item in the table can for our purposes be ignored, for it represents unanticipated growth in the previous year's billings for fringe benefits. These have often arisen due to deficits at the Yale Health Plan that are charged against the Yale faculty account in the following year. Yale attributes 4.8 percent of faculty salaries to paid leaves, whereas such schools as Columbia, Dartmouth, and Rochester apparently have no sabbatical leaves.

To complete the story, this report should contain comparable cost-based estimates of the value of paid leaves provided by other major universities, reported by rank and, if possible,by divisional and department affiliation of the faculty. Unfortunately, only a few observations and fragments of data are available about the level and distribution of this important fringe benefit. At the senior faculty level, Yale's triennial leave of absence policy appears competitive with that of other major schools and in several cases superior, as it is,for example, to Chicago's,where there is no assured leave policy. At the junior faculty level, Yale may be competitive in the humanities where 98 semesters of paid leave were supported by Morse fellowships (including fringe benefits) over the four academic years 1973/74 to 1976/77, but less competitive in the social and natural sciences, where only 51 semesters of Junior Faculty fellowship leaves were awarded during this four-year period.[9]

While Morse and Junior Faculty fellowships are in no way automatic, a junior faculty member's chances of obtaining one of the fellowships appears good in the humanities. For example, in the English department, fifty-four faculty members were nominated by their department for Morse fellowships for 1968/69 through 1978/79, and thirty-nine were awarded, or 74 percent. In the History department, thirty-seven nominations were advanced by the department

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8. These data do not agree with other information. We are unable to determine why Columbia, for example, reports no sabbatical leaves when other documents suggest that Columbia provides paid leave to tenured faculty consisting of a term every six years.

9. In 1976/77 there were 118 regular ladder faculty below the rank of professor in the humanities at Yale, and 191 in the social and natural sciences. These numbers suggest one semester in five years is supported by a Morse fellowship in the humanities, and one semester in sixteen years is supported by a junior fellowship in the social and natural sciences. Other means of Yale support are, of course, available.

year off with pay; in any case, one semester is virtually guaranteed, at least in the humanities. So far as this aspect of status is concerned, Yale is an attractive place to begin an academic career in which teaching and research can be combined.

As suggested by Table 4.5, sabbatical leaves cost the university about one-twentieth as much as all regular faculty salaries. This substantial fringe benefit, however, is not evenly distributed across fields at Yale, as the comparison of Morse and Junior fellowships suggested earlier. Table 4.6 reports the number of leaves taken by the faculty in the last seven years. Leaves are distinguished by whether they were formally (1) paid by Yale or (2) granted without pay. These figures from the records of the Yale College Dean's Office may not include all Morse fellowships and some other leaves paid for by Yale or by Yale-controlled funds that are not channeled through the Dean's office. For what the data are worth, it appears that about three-fourths of Yale leaves are paid for by Yale, but the pattern of securing outside support for faculty leaves varies substantially from department to department. In Anthropology, Economics, Italian, and Political Science, more than half of the faculty leaves are funded from external sources, resulting in large savings for the university. At the other extreme, American Studies, Biology, Chemistry, Engineering and Applied Science, East Asian Languages and Literatures, Geology and Geophysics, Near Eastern Languages and Literatures, Psychology, Religious Studies, Southeast Asia Studies, Spanish, and Statistics have relied on Yale support for 85 percent or more of their faculty leaves.

Since 1973/74 there has been a policy that Junior Faculty leaves were conditional on evidence of outside support having been sought. Last year a similar stipulation was applied to senior faculty applying for triennial leaves of absence with pay. However, Table 4.6 does not suggest that these regulations have greatly affected the proportion of leaves paid for by Yale, or altered the notable variation in this percentage across departments. As in the treatment of research support that is discussed in the next section, these figures suggest some departments treat paid leave as a perquisite of all department faculty, while other departments treat it as an insurance policy that is cashed only when research and sabbatical fellowship opportunities fall through.

The decision the faculty should consider is whether they prefer to receive a substantial fraction of their compensation as an obligation on the part of the university to provide all faculty with periodic leave with pay, or whether they prefer to have more of their compensation as salary and conventional fringe

and thirty were awarded, or 81 percent. It is not known, however, how many junior faculty applied for the fellowship but were not nominated by their department.

Beginning in 1973/74, a new policy went into effect guaranteeing all assistant professors "one term of paid leave of full salary if they have served four years as instructor or assistant professor in a department of the FAS with two-thirds salary at least paid by Yale, have not had any kind of leave during the year their leave is taken, and submit evidence of efforts to obtain outside funding." Between the Spring term 1974 and the Spring term 1977, eight such semester leaves were granted. In addition, newly promoted associate professors are now eligible for a Senior Faculty Fellowship, sabbatical leave of absence, or triennial leave of absence during the first or second year in their rank.

Yale's policy of paid leaves for its junior faculty is at least on a par with that of other comparable institutions. Harvard and Princeton offer one semester of paid leave, Harvard in the fourth year of teaching and Princeton sometimes during the first three years of teaching. Chicago offers the possibility of one quarter of paid leave or two quarters at half pay after twelve quarters of teaching. Columbia does not appear to have a junior leave policy. At Yale, to recapitulate, the chances are good that one year of paid leave may be obtained in the humanities and somewhat more problematic in the social and natural sciences. The Yale leave is granted usually in the third through fifth year, providing that a suitable proposal for a research project is developed and given departmental support.

Like comparable institutions, Yale appears willing to grant unpaid leaves of absence in cases where an outside fellowship has been obtained, providing that such leaves do not seriously interfere with the department's teaching and are recommended by the department.[10]

In sum, it seems that the present opportunities for paid leave of absence for junior faculty members at Yale are comparable to those at other major institutions. A junior faculty member stands a reasonable chance of getting a

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10. However, recent policy changes within the Fellowship Division of the National Endowment for the Humanities (NEH) have eliminated a special competition for junior faculty, and have combined senior and junior faculty in a common pool. Moreover, recently adopted regional competition within NEH should make it still more difficult for Yale faculty to obtain these fellowships. Many large federal agencies supporting research are under similar pressures from Congress to spread their support geographically.

Table 4.6

Faculty Leaves Paid by Yale and by Other Sources, 1972-1978, by Department

Department or Program	Percentage of Leaves Paid by Yale 1972/73 to 1978/79	Number of Terms of Yale Paid Leave and Number of Leaves without Salary (non-Yale-paid)** 1972/1973	1973/1974	1974/1975	1975/1976	1976/1977	1977/1978	1978/1979
Administrative Sciences	65	2,2	1,1	3,3	3,0	2,0		
Afro-American Studies	50					0,2	2,0	
American Studies	93		2,0	2,0		3,1	1,0	6,0
Anthropology	47	2,6	2,4	1,1	4,0	3,0	3,2	2,6
Astronomy	50			1,2	1,2	1,0		1,0
Biology	97	15,0	7,2	6,0	10,0	10,0	13,0	3,0
Chemistry	87	7,3	4,0	4,3	6,0	7,0	5,0	7,0
Classics	74	3,4	4,0	4,4	2,0	4,0	5,1	7,1
Comparative Literature	67	1,0	2,0		2,1	1,0		0,2
Computer Science	60		1,2			2,1	1,1	2,0
East Asian Lang. & Literature	89		1,0	2,0	2,0	2,0	1,0	0,1
Economics	44	10,11	4,10	8,9	10,9	5,15	13,10	10,11
Engin. & Applied Science	92	11,0	5,1	8,2	9,0	9,2	7,0	5,0
English	79	7,1	15,7	17,8	13,4	16,2	15,3	12,0
French	79			2,2	4,0	5,0		4,2
Geology & Geophysics	86	5,0		3,0	4,0	5,1	3,2	4,1
German	79	4,1	0,1	4,2		1,0	5,0	1,0
History	64	12,6	7,10	9,9	9,3	12,6	12,1	11,6
History of Art	73	2,4	4,2	4,1	7,2	7,0	3,0	3,2
History of Science & Medicine	86			3,1			3,0	
Italian	44			2,2			2,3	
Linguistics	60	1,0	0,2	2,2	2,0	2,1	2,1	
Mathematics	81	9,0	1,4	5,1	9,2	2,0	9,0	4,2
Molecular Biophy. & Biochem.	81	3,0	2,0	1,0	2,0	2,2	2,0	1,1

Table 4.6 cont.

Department or Program	Percentage of Leaves Paid by Yale 1972/73 to 1978/79	Number of Terms of Yale Paid Leave and Number of Leaves without Salary (non-Yale-paid) 1972/1973	1973/1974	1974/1975	1975/1976	1976/1977	1977/1978	1978/1979
Music	72		3,4	4,0	4,0	0,2	3,2	7,0
Near East. Lang. & Literature	87	2,0	2,2	2,0		2,0	3,0	2,0
Philosophy	78	3,2	5,0	6,0	7,0	8,3	7,4	6,3
Physics	69	2,1	6,4	4,1	4,1	2,2	3,2	6,1
Political Science	40	6,16	10,9	1,4	1,3	5,4	6,11	9,6
Psychology	89	6,1	5,5	6,0	14,0	8,0	10,0	7,1
Religious Studies	87	3,0	1,0	4,2	3,0	3,2	7,0	6,0
Romance Languages	82	5,2	9,1					
Slavic Languages	73	2,0	3,0	2,1	1,0	1,0	0,3	2,0
Sociology	60	4,3	7,4	3,0	3,0	3,6	2,1	3,3
Southeast Asia Studies	100	1,0				1,0		
Spanish	100			4,0	8,0	3,0	2,0	2,0
Statistics	100		1,0	1,0	1,0	1,0	1,0	1,0
Total	72%	67%	61%	68%	84%	73%	76%	73%

*It should be noted that these records may not be complete according to the College Dean's Office that provided them for the Committee. In particular, Junior and Morse fellowships may not all have been included in totals.

**The first numeral represents the number of Yale-paid leaves; the second, the number of leaves paid otherwise.

benefits at the cost of fewer assured leaves with pay. One way to increase salaries and not correspondingly reduce the supply of leave monies, is to give all faculty real encouragement to secure outside funds for leaves. This could be achieved if the Dean of the College asked department Chairmen to assign priorities to their leave requests, and if leave monies were then allocated to departments approximately in proportion to ladder faculty salaries, averaged out, perhaps, over the previous five years. Though the proportion of leave monies to salary would vary somewhat from department to department depending upon the scarcity of leave support, the pool would presumably always be less than adequate to meet the demands of the faculty eligible for leave. This new leave policy would immediately strengthen Yale faculty in their competition for outside fellowships, such as Guggenheims, which are often financially scaled down or rejected for Yale faculty because the Guggenheim Foundation staff knows Yale triennial leaves are available to all senior faculty.[11] A gradual shift in leave policy toward one that rewards departments more equally is recommended. If one semester in seven is currently a leave, and three quarters of these are paid for by Yale, the central administration might set its goal as transferring an amount equal to 10 percent of current regular ladder faculty salaries into a leave account. To encourage further reductions in the proportion of paid leaves below the existing three-fourths level, a large proportion--perhaps half--of the leave account that is not spent should be placed at the disposal of the economizing department. Visiting professorships, research facilities, set-up costs for the research support of junior faculty, would all be suitable uses for these surplus leave funds. The remainder (half?) of the unspent leave monies might revert to the Provost's Office to augment the faculty salary pool for the next year. This policy is likely to promote a modest tendency toward equalization in leaves across departments, provide an incentive for departments to economize on leaves and thereby save university resources, and encourage departments to allocate paid leaves according to merit.

Retirement Policy and the Law

The recent amendment to the 1967 Age Discrimination in Employment Act prohibits private and non-federal government employers from retiring an employee involuntarily before the age of 70. As enacted, this federal law

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11. The National Endowment for the Humanities is also now refusing to fund Yale triennial leaves because they are treated by Yale as a university obligation.

becomes effective for tenured college and university faculty on July 1, 1982. Since Yale has traditionally required retirement at age 68, the new federal law will have contributed to a decline in the number of retirements from 1982 to 1984, and leave the university thereafter with a somewhat older age distribution of faculty.[12] This change in federal law is interpreted by some as a first step in phasing out all mandatory retirement schemes based on age. Connecticut has not waited for the eventuality but has followed the example of California in enacting such legislation, though its scope and effect are not yet clear. It would seem advisable, therefore, for Yale to develop flexible new policies for dealing with the elimination of a mandatory age of retirement which will serve the interests of various university constituencies without abridging the rights of any. The underlying issues would appear to require reinterpretation of the institution of tenure and the management of salary and fringe benefits to encourage retirement selectively but preserve, to the extent possible, the scope for individual choice. Clearly, these issues are of fundamental concern to the faculty and should promptly receive detailed examination and open discussion. In the fall of 1978, a committee was appointed to consider this matter. The goal would appear to be to fashion a structure of selective incentives that would encourage late retirement by individual faculty who currently contribute the most to the institution's achievements in instruction and research. Several areas for study can be identified, but analysis of the issues has only begun and experience with these options and their legal interpretation will accumulate only slowly.

One possible area of response that might prove defensible under current law is to structure fringe benefits differentially by age, as is already common

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12. In recent years about eight to ten professors retired each year at Yale. This implies that in 1982/83 and 1983/84, if no one retired before 68 before these years and everyone worked to age 70 thereafter, there would be a loss of some 18 replacement flows over this two-year period. If the retirements were replaced normally with a sequence of promotions, it might be expected that there would be about 18 fewer entry level appointments in this two-year period out of the usual number approaching one hundred. Since the compensation of the non-retiring older faculty is about twice that of the younger assistant professor, the university faculty compensation budget would thereby increase by some $300,000 to $400,000, holding overall faculty size constant. After 1984, the rate of new hiring and promotions would return to normal but the slightly older age-distribution of the faculty would continue to perpetuate the above indicated financial burden on the university. This does not appear to be a very large adjustment cost for the university to absorb, but is yet one more financial burden that may be imposed immediately by the Connecticut law and augment even more the deficit in the next couple of years. For a general report on the subject see the AAUP Bulletin, Sept. 1978, Vol. 64, No 3, p. 181.

at many universities where pension contributions by employers increase for faculty over age 40, as at Harvard. In this case, however, it might be proposed that the university would reduce or cease its contributions to retirement pensions after faculty reach the "normal" retirement age, which could be 60, 65, or 68. If the retirement plan were designed initially to provide a respectable income level for faculty retiring at the normal age, then continued service beyond that age would increase the size of the retirement annuity received by the faculty upon retirement even without further contributions by faculty or university. Social Security would also continue to accumulate, reducing still further the justification for additional university pension contributions. The rationale for triennial leave after age 60 may also deserve reappraisal, for this institutional obligation makes better sense as an investment in the future productivity of Yale faculty than it does as a lifetime perquisite. On the other side of the ledger, it might be investigated whether fringe benefits that are highly valued by older faculty might not be made available, but only to older faculty when they retired. For example, subsidized membership in the health and major medical plan for locally resident professors emeriti might be a minor cost to Yale which could encourage early retirement. Although early retirement programs have received considerable publicity of late, relatively few universities have developed programs to stimulate earlier voluntary retirement, and almost no firm evidence could be found by the committee on their efficacy. The principal barrier has been the cost of providing sufficient additional financial inducements. Contributing to retirement pension plans rather than drawing them down for several additional years before retirement augments substantially the individual's post-retirement level of income. It is, therefore, very expensive for an employer to make the actuarial value of the early retirement option comparable to that of the later retirement option at the age when the postponed retirement would have begun. In this era of inflation and uncertainty regarding the value of one's savings, early retirement for an individual also involves a new element of risk which may slow the long-term trend toward earlier retirement which is evident in academia as well as in other segments of the U.S. labor force.

In a university such as Yale, moreover, the professional commitment to research and teaching may be of overwhelming importance to older faculty. Faculty approaching retirement may place great value on their access to the library, laboratory, and computer and rely heavily on the stimulation of their colleagues and students. Means should be sought, if they have not already

been institutionalized, to assure emeritus faculty all financially feasible privileges and rights to continue as active participants in the university community.

If all forms of age-based mandatory retirement become illegal, then the commitment of the university to its tenured faculty is likely to be explicitly or implicitly revised. The faculty should provide the leadership in this important area to assure that the interests of all constituencies of the university are considered. New procedures may be required for peer review, perhaps at the department level, to determine on an individual-by-individual basis whether to continue the university's commitment for employment beyond the "normal" retirement age. Clearly, if procedures of this form are adopted, it will be essential that each faculty be informed of the decision about extending his tenure several years in advance to permit him to make arrangements at other institutions, should he wish.

Finally, elimination of a mandatory retirement age at Yale will encourage a more selective and competitive review of salary increments among older faculty. It will become increasingly inevitable that the university will be able to encourage through financial incentives a continued instructional commitment of faculty beyond the normal age of retirement only among the most active scholars. To abide by the new law, it may be advisable to institute a regular compensation review for all tenured faculty that will involve both Chairmen and Division Committees. Departments might initiate an evaluation of the current contributions of faculty every five years, starting, say, at age 55. Division Committees might then consider the departmental recommendations for adjustment of compensation and forward their evaluation to the Provost. As in most other occupations, average salaries in academia in the future are likely to plateau in real terms and decline when an individual approaches retirement age. In the current strained academic labor market, flexibility in setting salaries and fringe benefits in the preretirement years may be an unavoidable response to federal and state legislation on retirement policies. These policy responses are, of course, of great importance to faculty. If each policy option is pursued in moderation at Yale, their combined effect would probably maintain the current timing of faculty retirements, and hence help maintain a more balanced age structure as well as enhance the opportunities of hiring younger faculty in the years ahead. A well-balanced mix of policies is needed to encourage earlier retirement in general, and yet selectively retain the services of the most productive scholars. A blue-ribbon faculty committee on retirement and the

age structure of the Yale faculty is needed to address these issues and to evaluate the content of the tenure contract.

Recommendations

Designing the most advantageous package of fringe benefits involves complex legal regulations and economic issues that this committee has not fully addressed. The faculty should have a standing committee concerned only with fringe benefits. Ideally, such a committee would be provided with legal and economic counsel to aid it in reassessing all existing elements and in drafting modifications of the faculty fringe-benefit package. Its object would be to determine whether fringe benefits are designed to meet the needs of Yale faculty and serve the objectives of the university in transferring compensation to faculty in the most beneficial form with equity. More specifically, it is proposed that a number of changes be instituted without further delay:

1) The percentage of compensation received in the form of fringe benefits by Yale faculty should be increased to match the levels attained a decade ago (15-20 percent), in recognition of the inadequacy of current retirement pensions and the continuing progressivity of the income tax system.

2) To the extent feasible, all fringe benefits should be indexed to the price level so as to maintain their level as a constant proportion of salaries, and thus become insulated from the rate of inflation.

3) The university should prepare a thorough study of faculty pensions that would build on the projection assumptions outlined in this report, and thereby justify how much of an increase in university contributions to tax-deferred annuities is now required to assure faculty of a "respectable" retirement income.

4) The administration should begin negotiations to modify Yale's TIAA/CREF plan to permit faculty and university contributions to the pension plan to be allocated by individual choice between the conventional current retirement plan and the new TIAA/CREF Supplemental Retirement Annuities which have greater liquidity value. This modification in Yale's fringe benefit package would have substantial appeal in attracting and retaining junior faculty. At the moment, half of Yale's assistant professors do not participate in the inflexible retirement scheme.

5) The very low $15,000 ceiling for coverage under the Major Medical insurance should be increased 30 to 50-fold to approach the level of one million dollars provided Yale nonfaculty staff.

6) The faculty children's scholarship plan should be indexed to equal a fixed

percentage of Yale tuition at a level higher than the current inflation-eroded 29 percent.

7) Yale leave policy is a costly fringe benefit which currently is treated differently across departments. A new, more uniform leave policy should provide all departments with some incentive to raise fund for faculty leaves.

8) Finally, given new federal and Connecticut laws on retirement age, the faculty should consider alternative sets of policies that can encourage earlier retirement, including the phasing out of fringe benefits and the selective allocation of leaves and the reduction in real salaries. Future retrenchments at Yale, combined with the age-of-retirement issue, will unavoidably raise the problem of how to modify the tenure contract and secure peer review of compensation and retention beyond the "normal" retirement age. The Yale faculty should provide leadership in dealing with this issue that is central to their status as faculty.

5. The Environment For Research

There is no unambiguous way to determine what fraction of Yale faculty time is devoted to research and the acquisition of new knowledge, or what fraction of Yale expenses, other than faculty compensation, is spent in support of research. The ambiguity arises in part because it is difficult to separate neatly those persons and activities that are involved in research from those involved in instruction, or to ascertain how much one of these activities in a major university enhances achievement in other spheres. According to any reasonable criteria for allocating operating costs, it is clear that a substantial share of Yale's current resources are spent on research-related activities. Included in this share are the costs of maintaining Yale's cultural repositories, extending its research library collections, modernizing its laboratories and computational facilities, and supporting directly and indirectly the actual research endeavors of its faculty. Were the current level of research activity within Yale to diminish, there would certainly follow a deterioration in the quality of graduate and undergraduate instruction, and an inevitable decline in Yale's reputation as a major center of learning.

But the heavy commitment of Yale's resources to faculty research can be met, to some degree, by the receipt of outside awards from private foundations and public agencies. Securing these grants, of course, is itself a costly process requiring faculty and staff time. Also, the availability of funds for research does not always signal the significance of the research for society or its compatibility with Yale's other objectives, i.e., instruction. Nonetheless, the competition of faculty for outside research support provides valuable information from the outside peer review of the scientific and social promise of the research proposals of the faculty, and imposes a salutary discipline in the competition of new ideas and methodologies. In some fields more than others, this external evaluation process is widely accepted as a valid reflection of the professional standing and reputation of a university's faculty. But there are also costs and risks associated with the growing dependence of universities on outside sources of support for maintaining their stature as centers of learning and research.

In the last decade it appears that Yale policies have, perhaps unconsciously, struck a new balance in favor of using more internal resources and endowment to support its faculty's research effort. This change in policy may be credited with providing a potential degree of independence for the faculty in selecting research issues that cannot be dictated by outside funding sources,

and may have reduced regulatory red tape, which itself consumes an enormous amount of vital resources in higher education. Few other universities, however, have followed Yale's example, perhaps because they felt they could not afford the luxury. In the last decade the direct costs of reimbursed research activity performed by Yale's Faculty of Arts and Sciences (FAS) decreased by a third in real dollars. This disconcerting development can be partially attributed to the weakened internal incentives given to faculty and departments to compete for outside research funding. This trend in diminished external support for research has contributed to the widening university deficit experienced recently. Yale's administrative policies pertaining to faculty research can be viewed, therefore, as having contributed to Yale's fiscal malaise, which in turn has been used since 1970 to justify the previously documented 14 percent decline in real faculty salaries.

It is the consensus of the committee that the implicit Yale policy of self-reliance in funding faculty research is today financially unsound unless the administration acquiesces in a decline in the professional reputation of the university. Moreover, without replacing the discipline of external review of research proposals by an internal Yale mechanism to identify selectively and encourage only the best research, Yale has not turned to best advantage the gain in research independence it purchased at great economic cost. Rather a university-wide support of research has been treated as a perquisite of all faculty.

A review of Yale's performance in the last decade is consistent with these disturbing conclusions,though proof is not at hand. Without information on the changing supply of research funds by field or information on how other similarly distinguished university faculties have performed in the recent market for external support, it is not possible to assess precisely how much of Yale's poor performance is due to its apathetic policy toward research and how much is due to other developments. It may be noted, however, that Federal funds to universities for research and scientific activities,[1] a proxy for the supply of national contract and grant funds, grew annually at 2.2 percent in real terms over the last decade, while in the Yale FAS the receipt of such funds declined on average over the last nine years by 3.7 percent per year. The circumstantial evidence available to the committe is sufficient to recommend the immediate

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1. Survey of Science Resources, National Science Foundation, 77-301, Vol.25, cited in Supplement to Budget Report, Yale University, December 1977, p.

adoption of a number of new policies aimed at reviving the inflow of external funding for research activities, and assuring that all segments of the Yale faculty benefit equitably from this revival.

With the assistance of the Treasurer's Office, the committee obtained data on grant and contract income by department of receipt within FAS and by supporting agency. Table 5.1 shows the direct and indirect costs of research in FAS that were reimbursed by external sources during the last decade. Direct costs include salaries, wages and fringe benefits paid to faculty and other research support staff, as well as directly billed services, supplies, postage, telephone, travel and associated expenses. The indirect cost recovery rate or "overhead" rate is the value of indirectly charged services provided by the university to all supported research projects, divided by the base of directly charged costs of wages, salaries, and fringe benefits.[2] What may be attributed to indirect costs is justified to federal governmental auditors from time to time, and tends to include such things as the value of research facilities, offices, libraries, and equipment, maintenance and utilities, and central administration. Nongovernmental sponsors of research at universities establish their own policies regarding the "overhead" rate they will reimburse, and these rates tend to be substantially less than those set by the government.

It can be seen from the nominal dollar amounts in column 4 of Table 5.1 that the total of reimbursed costs of research in Yale's FAS has been roughly constant in current dollars. It is difficult to know what the best price deflator for university research should be, but dividing by the consumer price index in column 1, we find the approximate real 1967 dollar total of research funds obtained by Yale which is shown in the second entry of column 4: <u>real resources for research from outside the university declined almost a third in this decade</u>. But within total costs it should be noted that government research "overhead" rates rose sharply to the 1978 level of 76.5 percent of salaries and wages, and overall indirect recovered costs as a percentage of direct expenditures on reimbursed research in FAS virtually doubled from 15.6 percent in 1967/68 to 29.6 percent in 1976/77 (column 5). Much of grant and contract support to Yale FAS is for educational and training purposes, for

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2. As noted later in this section, recent changes in the accounting methods for research and contract support at universities, as proposed by the Office of Management and Budget last year, may shift Yale to calculating its indirect cost recovery rate on the basis of all direct costs inclusive of equipment, rather than the current basis of only wages and salaries and fringe benefits.

Table 5.1
Research and Contract Direct and Indirect Costs

Reimbursed to Yale's Faculty of Arts and Sciences*

Academic Year	Consumer Price Index** (1)		Direct Costs (2)	Indirect Costs (3)	Total Costs (4)	Indirect as percentage of direct costs (5)
			(in thousands of dollars)			
1967/68	1.00	nominal $	12998	2028	15026	15.6
		1967 $	12998	2028	15026	
1968/69	1.04	nominal $	15148	2249	17397	14.8
		1967 $	14565	2163	16728	
1969/70	1.10	nominal $	15356	2522	17878	16.4
		1967 $	13960	2293	16253	
1970/71	1.16	nominal $	14684	2744	17428	18.7
		1967 $	12659	2366	15024	
1971/72	1.21	nominal $	14869	3107	17976	20.9
		1967 $	12288	2568	14856	
1972/73	1.25	nominal $	12589	3339	15928	26.5
		1967 $	10071	2671	12742	
1973/74	1.33	nominal $	12505	3532	16037	28.3
		1967 $	9402	2656	12058	
1974/75	1.48	nominal $	12586	3207	15793	29.1
		1967 $	8504	2167	10671	
1975/76	1.61	nominal $	13462	3788	17250	28.1
		1967 $	8356	2559	10714	
1976/77	1.71	nominal $	14229	4213	18442	29.6
		1967 $	8321	2464	10785	
1977/78	1.82	nominal $	15383	4385	19768	28.5
		1967 $	8452	2354	10862	

*School category 31 does not exactly correspond with the FAS category in the Treasurer's Reports, which include in recent years Yale College and Graduate School (32 and 35).

**The real cost figures in 1967 dollars are obtained by dividing the academic year totals by the consumer price index for the calendar year in which the academic year starts.

Source: Treasurer's Office and Reports.

which government overhead rates are much lower than for research. Private foundations follow a similar policy.

Direct costs recovered for research at Yale, from which actual expenditures can be made by faculty on their own research projects, including the payment of their own salary, declined in real terms from 1967/68 to 1976/77 by some 36 percent. In the same nine-year period, Yale university-wide expenditures increased in real terms by 26 percent, its deficits grew to $6.6 million, and the real purchasing power of its endowment fell 40 percent.[3]

In only the most recent five years do the records permit one to break down grant and contract research support into recipient research units and departments; the percentage share of the FAS total of indirect and direct cost reimbursements are shown by research unit or department in Table 5.2. In this short span of years trends may be misleading, but the direct cost share of the physical and biological sciences has remained nearly constant at three-fourths of the FAS total. The social sciences may have experienced a decline in their share, from 20 to 15 percent, while the humanities and foreign languages doubled their 1.3 percent to 2.5 percent. The Concilium stood at about two percent, and in the final years the miscellaneous final category grew to account for 5 percent. Though the humanities and foreign languages demonstrated their capacity to obtain research support during this period, the sciences and a few departments in the social sciences continue to account for almost nine-tenths of the recovered direct costs of research in Yale's Faculty of Arts and Sciences.

In contrast with research policy within FAS, Yale's Medical School has proceeded in the opposite direction, strengthening the individual and departmental rewards associated with faculty securing outside funding for their research. As a consequence, in recent years the Medical School has sharply increased its receipt of research awards at a time when relevant NIH research budgets for the nation have grown little in real terms. The professional ranking of the Medical School has also risen. Only because the Medical School is combined with FAS in the Budget Report (viz., Table E and p. 29) does it appear that overall grant and contract income at Yale has increased at the same rate

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3. University-wide figures are drawn from Achieving Financial Equilibrium at Yale: A Report on the Budget, December 1977. Expenses rose from $99.3 million in 1967/68 to $202.8 million in 1976/77, the deficit from $.6 to $6.6 million, while the endowment grew in nominal terms from $545.7 million to $562.9 million. The consumer price index as included in Tables 2.1 and A-4 is used to deflate these figures to real terms. See Budget Report above, Tables D and M, for original data.

Table 5.2

Percent Share of Total Grant and Contract Income by Department or Center in the Faculty of Arts and Sciences: Direct and Indirect Costs for Fiscal Years 1972/73–1976/77

Department or Research Center	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78
Afro-American Studies						
Direct	.18%		.01%			
Indirect						
Comparative Literature						
Direct	.01%	.01%		.01%		
Indirect						
East Asian Lang. & Literatures						
Direct	.08%					
Indirect	.14%					
English						
Direct	.18%	.51%	.29%	.45%	.45%	.004%
Indirect	.03%	.26%	.23%	.17%	.15%	
French						
Direct	.03%	.07%	.80%	.89%	.12%	.11%
Indirect	.02%	.02%	.33%	.22%	.19%	.19%
History						
Direct	.49%	1.18%	1.70%	1.20%	1.15%	1.24%
Indirect	.44%	.93%	1.14%	.86%	.67%	.70%
History of Art						
Direct	.17%	.08%	.13%	.04%	.07%	.005%
Indirect	.10%	.25%	.09%	.10%		
Near Eastern Lang. & Literatures						
Direct	.12%	.02%	.16%	.17%	.16%	.09%
Indirect	.12%		.18%	.14%	.15%	.11%
Philosophy						
Direct	.002%					.16%
Indirect						.10%
Slavic Lang. & Literatures						
Direct	.03%	.05%	.04%	.16%	.20%	.12%
Indirect	.06%	.01%		.01%	.12%	
Dept. of Administrative Sci.						
Direct	1.28%	1.47%	-2.05%*			
Indirect	1.62%	1.78%	-2.30%*			
Anthropology						
Direct	.93%	1.09%	.99%	.65%	.39%	.53%
Indirect	.56%	.31%	.31%	2.70%	.31%	.07%

*These negative percents represent transfers.

Table 5.2 (cont.)

Department or Research Center	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78
Economics						
Direct	.51%	.46%	.44%	.75%	.77%	.72%
Indirect	.41%	.28%	.24%	.53%	.65%	.81%
Economics - Cowles Foundation						
Direct	1.97%	1.99%	2.58%	2.85%	2.15%	2.54%
Indirect	2.29%	3.19%	4.27%	4.29%	3.93%	4.41%
Economic Growth Center						
Direct	3.54%	2.72%	2.18%	1.76%	1.78%	1.18%
Indirect	2.75%	3.01%	1.86%	1.30%	1.88%	1.18%
Linguistics						
Direct	.19%	.32%	.44%	.12%	.07%	.22%
Indirect		.56%	.62%	.14%	.06%	.24%
Political Science						
Direct	1.12%	.62%	.72%	.63%	.36%	.62%
Indirect	.69%	.38%	.48%	.23%	.02%	.36%
Psychology						
Direct	9.09%	8.33%	8.31%	6.64%	8.28%	8.69%
Indirect	9.59%	8.55%	8.79%	7.06%	9.35%	10.46%
Sociology						
Direct	1.68%	1.81%	1.88%	1.76%	1.39%	1.09%
Indirect	.65%	.62%	.56%	.68%	.73%	.58%
Statistics						
Direct	.21%	.16%	.20%	.33%	.49%	.42%
Indirect	.36%	.20%	.32%	.60%	.76%	.65%
Division of Natural Sciences						
Direct	1.26%	1.06%	1.02%	.51%	1.75%	.97%
Indirect						
Heavy Ion Lab. Accel.						
Direct	2.83%	2.41%	2.32%	.04%		
Indirect	3.40%	3.08%	2.81%	.04%		
Biology						
Direct	11.42%	13.54%	16.82%	16.34%	15.72%	16.51%
Indirect	12.31%	11.92%	15.13%	13.19%	13.66%	16.09%
FAS Molec. Biophysics & Biochem.						
Direct	8.40%	7.87%	8.69%	11.05%	11.75%	9.77%
Indirect	7.78%	7.31%	7.56%	9.93%	8.76%	9.09%
Observatory - Astronomy						
Direct	.83%	.64%	.94%	1.07%	1.37%	1.76%
Indirect	1.32%	1.03%	1.51%	1.68%	1.99%	1.61%
Chemistry						
Direct	8.23%	8.77%	10.94%	9.16%	8.41%	7.13%
Indirect	7.72%	8.67%	9.35%	9.66%	9.78%	8.18%

Table 5.2 (cont.)

Department or Research Center	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78
ıter Science						
Direct	2.95%	.96%	.53%	1.58%	1.98%	3.65%
Indirect	.20%	.26%	.46%	2.28%	2.88%	4.16%
Engineering & Applied Science						
Direct	9.32%	10.16%	9.32%	10.22%	10.07%	10.47%
Indirect	12.25%	12.97%	12.14%	11.14%	11.49%	10.41%
Geology & Geophysics						
Direct	6.02%	5.22%	4.91%	3.92%	3.45%	3.06%
Indirect	7.86%	6.31%	5.93%	4.65%	4.57%	4.09%
Mathematics						
Direct	1.83%	1.67%	1.88%	1.65%	1.76%	1.61%
Indirect	2.90%	2.73%	2.81%	2.84%	2.99%	2.91%
Physics						
Direct	22.22%	23.39%	19.48%	18.67%	18.08%	18.62%
Indirect	23.74%	24.92%	23.58%	23.60%	21.78%	20.50%
American Studies						
Direct		.14%	.01%	.25%	.03%	.47%
Indirect				.05%	.07%	
Classics						
Direct		.12%	.16%			
Indirect			.15%			
c						
Direct				.11%	.14%	.02%
Indirect					.11%	.002%
Religious Studies						
Direct				.11%	.14%	.34%
Indirect					.13%	.33%
Div. Director Humanities						
Direct		.09%	.14%			
Indirect		.06%				
Concilium & Councils*						
Direct	2.09%	2.40%	2.91%	1.77%	2.51%	3.03%
Indirect	.70%	.44%	.33%	.48%	.49%	.76%
Miscellaneous**						
Direct	.80%	.66%	1.08%	5.20%	5.01%	4.87%
Indirect			1.04%	1.75%	2.31%	2.01%
TOTAL						
Direct %	(100.01)	(99.99)	(99.97)	(100.06)	(100.00)	(100.01)
in $	12,589,073	12,504,761	12,586,292	13,461,680	14,228,975	15,382,798
Indirect %	(100.01)	(100.05)	(99.92)	(100.32)	(99.98)	(100.00)
in $	3,339,340	3,532,098	3,206,641	3,788,382	4,212,932	4,384,821
Indirect as % of Direct	26.53%	28.25%	29.06%	28.14%	29.61%	28.50%

*Includes Concilium on Int'l Studies & Councils on African Studies, Asian Studies, Int'l Relations, Latin American Studies, Russian & East European Studies, S.E. Asian Studies, Comparative & European Literature.

**Includes Faculty Res. 1961 Grant, FAS Unallocated, Anatomy Instruction, National Humanities Institute (1973/74), and in 1977/78 Spanish and Italian (.04), Medieval Studies (.05) and History of Science and Medicine (.14/.28).

Source: Special tabulations prepared by the Treasurer's Office.

as have other sources of university income.[4]

After reviewing policies governing research in the Faculty of Arts and Sciences, the committee believes that a major overhaul in the incentive structure is mandatory; that the cost accounting practices of the university should be carefully reviewed, and that a systematic policy should be established for redistributing indirect cost recoveries from research funding to all segments of the university community, but particularly to those who bear the responsibility for raising research funds. For Yale to improve its research-funding position and use these new sources of income to encourage professionally recognized excellence in all fields of faculty research, the Yale faculty must themselves accept the responsibility to oversee administrative policy in this critical area. It would seem advisable to create from the Faculty of Arts and Sciences a permanent Committee on Research to perform this function, offer recommendations to the Provost and President, and report, at least annually, to the full faculty on its progress.

Individual Faculty Incentives

How can individual faculty be rewarded to undertake the burdensome task of collecting information on potential sources of support for their research, of writing research and training proposals, of defending them before peer and bureaucratic reviews, and of meeting deadlines for administrative reports? Some departments in FAS seek to reduce systematically an individual's teaching and administrative duties in proportion to the share of the faculty member's salary paid by outside research funds. Other departments follow more haphazard rules of thumb, and still other departments presume all faculty are active researchers as a matter of course, and therefore assign all of them similar instructional duties and provide them with similar levels of research support. Some departments that were responsible for large shares of the university-wide

4. Reports of the Treasurer from 1971/72 and 1977/78 indicate that in a six-year period when the consumer price level increased 50 percent, contract and grant income (direct and indirect cost recoveries) in the Faculty of Arts and Sciences and the Graduate School decreased 23 percent in real dollars, while it increased in the Medical and Nursing School by 22 percent. It fell 6 percent in the Law School, fell 53 percent in the School of Forestry and Environmental Studies, and increased 17 percent in the Institution for the Social and Policy Studies. Even if one classified ISPS as part of FAS these two groups experienced a decline in real research dollars of more than a fifth. Had these groups secured a constant real income from grants and contracts, this would have augmented Yale's resources by $3.8 million in 1977/78, or approximately twice the operating deficit in the year of $2 million.

research budget a decade ago today are following the policy of "equal" research and teaching opportunities for all faculty. One explanation for this policy which erodes faculty incentives to obtain their own means of research support is that these departments have come to accept as satisfactory their current level of research support received from the university, or that they do not see their own research facilities and amenities as being materially affected by an increase (or decrease) in the level of funded research in the department. The next section deals with ways of improving the allocation of indirect cost recoveries within the university to assure that all departments and research units will share the university's urgent interest in expanding external resources for research.

As a first step toward improving individual incentives, the central administration should monitor the criteria used by departments in the allocation of work loads and strive to introduce across FAS a more uniform policy of reducing instructional and/or administrative duties for faculty who succeed in obtaining their own salary support. This policy already has been endorsed by Congress and is being implemented by the Office of Management and Budget. The NSF and soon also the NIH are required to demand evidence when government agencies pay faculty salaries that these individuals are in fact proportionately released from instructional duties. As discussed later, it is unfortunate that Yale and other universities are being required by government regulations to redesign their accounting practices to fit bureaucratic needs in Washington. Nonetheless, this may be a rare example of the federal government's insistence on financial accountability also facilitating the creation at Yale of a more positive environment for the expansion of funded research. Yale's long-term financial and professional interests are probably served by coordinating the common guidelines used by departments in rewarding individual faculty in order to make their self-interested behavior congruent with university-wide policy of encouraging peer review of research and expanding university resources.

The only widely recognized incentive for faculty to secure outside research support is the opportunity obtained thereby to continue their research during the summer and pay themselves summer salary. Even in this respect Yale reduces the incentive that exists at other institutions. Untaxed university contributions to pensions and other fringe benefits are eliminated from summer salaries, cutting real wages paid to faculty during the summer months by 10 to 20 percent. Moreover, supporting agencies pay Yale some 16 percent of summer faculty sala-

ries for "fringe benefits" which are hard to identify for individuals on regular academic-year Yale appointments.[5] In recognition of either the shortening of the academic year (September to May, minus Christmas and Spring recesses, is closer to seven than to nine months) or the lack of a month's summer vacation for researchers, some universities have begun to permit faculty to receive summer research salaries for more than two months, and have thereby increased their academic-year salary by more than the traditional two-ninths as mandated by Yale. Shifts in Yale's FAS policy on both summer fringe benefits and duration of summer stipends would greatly strengthen incentives for faculty to seek summer research support. It should also be stressed that "overhead" on summer research projects directly eases the university's financial crisis. Offices, libraries, and research facilities not used in externally funded research projects are not readily reallocated to other reimbursable uses. With the termination of the summer school term, any expansion in summer research activity should increase the financial resources of the university and generate few additional offsetting obligations.

The level of support, of course, differs substantially from field to field, being more plentiful in the sciences, for example, than in the humanities. There are also substantial differences in faculty salaries across the country as a whole that correspond approximately to the availability of research funding and the employment opportunities for individuals in particular disciplines outside of academia in research,business, and government. Given the previously noted equality of academic-year faculty salaries at Yale across divisions and departments, it is not clear how Yale can hope to attract and hold a distinguished science faculty while it is unduly limiting the returns on effort aimed at obtaining summer salaries for research.[6] Unless

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5. As discussed in section 4 above, pensions are the major faculty fringe benefit, and the university makes no contributions toward pensions based on summer salaries. The second largest fringe benefit is the Yale Health Plan, which is annualized and hence not an added benefit for summer salaried researchers who are on a regular academic appointment at Yale. Fellowships for faculty children, life insurance plans, etc. are also organized on an annual basis and only unemployment compensation may still be an actual cost incurred by the university related to summer researchers, and this has limited value to most faculty. It would be interesting to know if unemployment compensation were actually available to faculty who do not get their summer grants! One suspects not.

6. Indeed, faculty at most medical schools, including Yale, are appointed on an eleven month (annual)basis, a not-uncommon practice at scientific or technological institutions where external research support is more important to the financial health of the schools.

summer research opportunities in FAS are made as attractive as they are at other universities, Yale is likely to lose its distinction in the fields that are prime beneficiaries of research support. Or at the very least, these faculties will spend their summers elsewhere, leaving Yale to absorb the substantial added cost of underutilized clerical and support staff on eleven-month appointments, and the fixed costs of maintaining unused physical facilities. Yale should treat faculty summer salary and fringe benefits on research projects as they do salary during the academic year and not impose on them an additional set of penalty taxes.

Special consideration for promotion or salary review should not be included among the incentives to obtain research funding. Advancement within Yale should continue to be based strictly on service to Yale in the form of teaching, administration, and advancement of knowledge as judged by professional peers. These credentials for advancement are associated with success in the competition for research support in most fields, but the association is distinctly imperfect. Investigations of many socially and professionally insignificant subjects may be funded by government agencies and private foundations as fads sweep through bureaucracies and professional elites. For this reason, it may also prove advisable to institute periodic reviews of larger research programs to determine their place in university priorities.

In sum, Yale faculty must turn more of their energies to a search for outside sponsors of their research. Exhortation will not achieve the long-term results that are needed to help return the university to fiscal balance and permit faculty salaries to grow overall at a more reasonable rate. Individual faculty must be provided with meaningful incentives that reward their efforts on behalf of the university; relief from teaching and administrative duties is an appropriate incentive. Advancement and salary review should not depend on the funding of research. On the other hand, it is neither equitable nor financially sound for Yale to impose an added tax on summer research stipends when they do not tax those obtained for work during the academic year. The university, indeed, has more to gain from encouraging summer research projects than those that compete for resources during the academic year. Continuation of Yale's current policy of taxing faculty summer research compensation can also only discourage the retention of faculty in those fields that have the greatest access to external support for their research.

The Distribution of Indirect Cost Recoveries from Research

Not only must incentives be restructured to motivate individual faculty to seek external support for research, but the research unit, department, and entire university faculty should also be able to realize gains from externally supported research and the consequent recovery by the university of indirect costs. There are two views of indirect cost recoveries or "overhead" within the university, one based on static long-run, average-cost accounting principles and the other based on the dynamic need to motivate agents to recoup for the university the cost of existing facilities and staff. In the first case, the federally determined indirect-cost recovery rate for Yale is a product of complex negotiations between university and government accountants. All categories of indirect research costs, including central administration, utilities, maintenance, and facilities, are rigorously scrutinized and approved by federal government auditors to the degree that they are used by the average research project. In this long-run, average-cost accounting sense, the university may "lose" money on the average research project or expend more resources on that average project than it recovers from a federal governmental sponsor.

But from the second point of view, most of the indirect costs of the typical research project are borne by Yale if the project does not receive external support. When external funding for research declines, as it has recently in FAS, Yale does not divest itself of research facilities, laboratories, computers, libraries and offices. Alternative uses for these resources yield far lower returns to Yale than if they are employed in performing the externally funded research for which they were designed. Thus, without external funding for research to utilize fully existing capacity at Yale during the academic year and summer, the full cost of these "overheads" is charged against other sources of university income and endowment, adding to the deficit, and restricting the growth of the salary pool available for faculty. Indirect cost recoveries, according to this second view, represent a real increment to the university's unrestricted income. Indeed, many other universities, such as the University of Chicago, treat this overhead item as an unrestricted income source in their detailed and functionally informative budgetary accounts.

An illustration might be useful to avoid the impression that we are proposing an "unbalanced" budget policy for Yale that would be financially less sound than the current average-cost accounting approach. If a member of a social science department, for example, works on a federally funded research

project during a summer, Yale collects 16 percent of his or her salary for the "elusive" fringes, and then another 88 percent of salary for overhead (i.e., 1.16 times salary times the current overhead rate of 76 percent). Without that grant the individual would probably still use office space and perhaps the computer facilities, as well as the services of clerical and secretarial staff (directly charged under a grant and a source of additional overhead).[7] Hence, the additional dollars obtained for indirect cost recovery represent a net gain to Yale's resources, over and above any increase they imply for Yale's research support obligations. Only as the university's research facilities become seriously overcommitted and congestion costs are incurred is it likely that additional funded research increases indirect costs. Examples might be the renting of additional office space for researchers, the hiring of additional central grant administrators, and the expansion of support services for which there are inadequate user fees, such as at the library. Few people have expressed the opinion to this committee that research facilities such as these are in need of expansion today at Yale.

If this second view of the unrestricted character of indirect cost recoveries is persuasive, it is important that these overhead funds be systematically allocated to foster excellence in research throughout Yale and provide additional incentive to achieve a satisfactory growth in grant and contract income for the university in the lean years ahead. The incentives for funded research should, therefore, directly benefit to some extent the research unit and the department of the investigator. These units typically bear some of the administrative costs of securing funding and managing expenditures, and departments should be encouraged to stand ready to adjust the teaching and administrative duties of their faculty to accomodate unanticipated fluctuations in the receipt of research awards. Some other universities, such as Princeton, have already initiated a policy of returning a share of recovered indirect costs to some larger originating units so that these units reap some of the benefits of their efforts to raise resources for the university and themselves.

The committee heard numerous complaints from researchers and research directors that their entrepreneurial efforts had been stifled and ignored under the Brewster administration. Yale's high indirect cost recovery rate was said

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7. Supporting and administrative staff at Yale are generally appointed on an annual basis and not furloughed for the summer when instructional activity is curtailed.

to have had a discouraging effect on marketing Yale's research potential, but in fact, Yale's overhead rate is comparable to that at other major private universities. Indeed, shifting equipment and perhaps facility costs to the direct cost base, at the urging of the Office of Management and Budget, may soon lower the Yale indirect-cost recovery rate, and allow these equipment costs to generate overhead on those projects where they are used most extensively. But it is the committee's view that these pervasive criticisms of research administration stem less from the accounting categories or the level of overhead rates than from a lack of perceptible benefits flowing to the research-oriented programs in the university. The recovered indirect costs generated by their research entrepreneurship were not explicitly improving their own research facilities and productivity, while centralized red tape was adding to their problems of research management and cost control.

In response to this understandable frustration among research units and departments, the committee proposes that Yale adopt the policy of returning to the originating unit 10 percent of recovered indirect costs. The research unit could use these discretionary funds for research-related construction, remodeling, equipment, and other items that are allowable indirect costs for inclusion in future determinations of overhead rates . In addition, a portion of the discretionary funds might be used to allow continuity in ongoing research projects that had encountered short-term lapses in funding.

An additional share of 10 percent of indirect costs recovered by the university might be allocated for support of the most promising research projects proposed by faculty members. Internal competition within Yale for these research monies would be restricted to unfunded proposals that had first been submitted to an external sponsor. In this way, these funds would effectively redistribute some of the gains of funded research beyond the individuals and units involved in the disciplines benefiting most from external research support and extend support to other members of the Yale faculty in fields where research funding is scarce. Younger faculty in the humanities may have the most to gain by this scheme. The encouragement of the best research projects within Yale can also reduce slightly our heavy, but probably unavoidable, reliance on government and foundations. Similar programs exist at other universities, but the interdivisional span of the research competition within Yale may require some innovative institution building.

Research Cost Accounting and Pricing

Cost accounting procedures for funded research should be reviewed by

faculty and administration and periodically revised to assure that external sponsors are being charged what it costs, on average, to conduct research at Yale. Only when the external price of doing research at Yale reflects the real costs of these activities across fields will Yale perform the research for which it is best suited. These intricate accounting and economic issues cannot be adequately addressed here, but recent developments may accelerate changes in these procedures and provide Yale's faculty with the opportunity in coming years to influence the process. Last year the federal executive Office and Management and Budget (OMB) proposed a new set of guidelines to account for costs that were directly attributable to a federally funded university research project. These proposed guidelines modified the procedures for estimating the indirect costs of research that would be reimbursed by the government. There are many undesirable features of these new OMB guidelines that Yale and other universities have opposed. The most onerous is a uniform reporting requirement on the use of facilities, equipment, libraries, and faculty time in funded research projects. But these proposals also have a positive side not adequately recognized at Yale. Aside from the fact that Yale's antiquated accounting system is now not equal to the task, the reforms are oriented toward achieving greater equity in research incentives across fields within a university. The guidelines urge universities to identify groups within the university that have distinctly different indirect cost bases and establish for each of them indirect cost accounts. If this were done, a research project in French literature might incur an indirect cost rate that reflected real costs in the humanities of pursuing research at Yale, such as maintenance of library services. A project in physics, on the other hand, would include the direct costs of utilized equipment and an indirect cost rate based on doing research at Yale in the natural sciences. The proposed shift to direct costing of equipment and facilities will reduce some current inequities of the Yale accounting system across fields. This use of fuller direct cost allocation rather than basing "overhead" rates on wages and salaries only is already employed at many universities. The application of distinct indirect cost recovery rates by division or segment of the university would go further in this direction and ought to be built into Yale's future accounting scheme. As other institutions adapt to the new OMB guidelines, the administration and faculty should determine whether the cost accounting procedures for research at Yale are servicing our long-run

interests, particularly if they are out-of-phase with the policies adopted by other major universities.

Research Management and Administration

A central administrative Office for Research Development should be constituted, with responsibility for administration of grant and contract income and improvement of the overall research environment at Yale. The director of this office should coordinate a small professional staff that would work with faculty and the present Grant and Contract Office to develop Yale's research potential and market its capacity. Flexible administrative aids should be developed to conserve the time of faculty in routine research management tasks. Current accounting and payroll procedures could be simplified for grant and contract administration, and standardized software on Yale's administrative computer could provide all grant and contract recipients with individualized projections of expenditures, actual outlays, and available funds to facilitate timely management decisions at little cost. Materials required as attachments to research projects should be prepared in a standardized format describing Yale's supporting research resources. These statements might describe library collections, data archives, computer facilities, laboratories, and the like. Federal government proposals require detailed description of pricing practices for some equipment, such as computers, that should be prepared centrally by accountants and promptly distributed to faculty to facilitate their submission of research proposals.

The centralization of such services in an Office of Research Development should help rather than hinder submission of research proposals. These centralized services would be a powerful aid for faculty submitting research proposals, particularly for young faculty members preparing their initial application for external support. The job of the university's research office should not be limited to identifying legalisms that might obligate Yale to deliver more than it can. This is an important responsibility, and one readily overlooked by scholars interested only in the substance of their research. But the research office under the scrutiny of a faculty advisory committee should do much more to manage and positively promote future research activity at Yale.

Decentralization of Support Services

The administrative control of support services for research appears to be excessively centralized; researchers report that costs are too high and that services delivered are often inadequate. The committee encountered a pervasive concern by researchers that the research support services are

organized inflexibly and delivered uneconomically, allowing the researcher little margin to maneuver to meet his or her needs at least cost. For example, what does an investigator do when a faucet doesn't work? He or she appeals for assistance to a centralized university authority. An individual from the centralized pool is assigned the task. Because the evaluation of the maintenance staff's work must pass through a lengthy chain of command, it is unlikely that good work is commended or poor work reprimanded. Without an adequate incentive structure, the quality of services deteriorates. Centralized authority gives the university the illusion of gaining economies of scale, but in fact costs appear to exceed the prices paid in the open market for similar services.

Communication between principal investigators, research adminitrators, and service personnel would undoubtedly improve if the authority for routine maintenance and custodial services were decentralized at Yale. Where demand is sufficient, each department or research unit could employ an individual for essential services. Smaller departments could employ an individual for a single maintenance activity and that department would also coordinate work scheduling and evaluation. It is our view that experimentation in decentralizing some service functions along department lines would provide more responsive and lower cost services to Yale's faculty and increase research productivity. Yale's technical staff might thereby be brought into closer contact with the needs and goals of faculty researchers, and given a common sense of purpose. Technical staff could not only be rewarded more generously according to their merits but also be held accountable. Researchers would have more incentive to design the appropriate mix of services that would best serve their own objectives. Limited service contracts with independent purveyors of services might also be encouraged to determine if costs can be reduced by further decentralization without incurring other serious side-effects. However, there does not appear to be a justification yet to explore these options in the Residential Colleges and the departments of the humanities and social sciences, for whom demands for services are limited to routine maintenance. Current faculty misgivings with the system require further faculty study while the Provost is urged to begin evaluating alternative delivery and control systems by experimenting with pilot decentralization projects that allow researchers to purchase their support services at the lowest cost within or outside of Yale.

Recommendations

The committee is concerned with the deterioration in Yale's FAS research funding. To reverse this trend, strengthen the quality of faculty research, and ease the budgetary problem, we propose the following:

(1) Assure that all faculty investigators receive meaningful relief from teaching and administrative duties commensurate with that portion of their salaries externally supported through their own research projects.

(2) Return 10 percent of indirect costs to originating research units.

(3) Allocate another 10 percent of indirect cost recoveries to a university-wide research pool that would support high-quality projects that have already sought support from external sources.

(4) Reevaluate cost accounting conventions in order to enhance the incentive structure for research at Yale and promote an equitable distribution by division of actual costs of doing research at Yale.

(5) Explore and evaluate alternative, less centralized methods of delivering support services to the larger research units and departments.

(6) Finally, establish an Office for Research Development that would combine the functions of fund raising and grant and contract management. It should help investigators assemble and market their research proposals. Statistical and accounting summaries from this office should inform the university community of the success or failure of the new incentives to reverse the recent downtrend in real research dollars at Yale. A faculty advisory committee should work with the office and advise the administration on how to build a more favorable environment for research at Yale. It is important that administrative convenience in accounting practices and neglect not be permitted to perpetuate the fiscal problems of the last decade.

6. The Budgetary Process of Planning and Growth Personnel

Administering a major modern university and planning soundly for its future require a great deal of accurate and timely information. Many difficult choices face any major private university that seeks to maintain a historic tradition of excellence in an era of falling demand for graduate student scholars. Yale has invested meager resources and little intellectual effort to structure its flows of information and to describe analytically its policy alternatives for using its resources to achieve multiple and at times contradictory objectives. To make these choices intelligently, Yale must be able to undertake sophisticated analysis of carefully collated data on the numbers of faculty, staff, and students as well as on complete budgetary detail about resources consumed and income and services generated by the various distinguishable and potentially responsible subunits. To pinpoint exactly why Yale has found itself in chronic financial difficulties in the 1970s, one might also have to compare Yale accounts with those of other universities in order to note unexplained deviations in Yale's policies and performance.

The greatest frustration of the committee was our inability to locate consistent information on income, expenses, and personnel for the university except for such aggregates so large as to be unilluminating. Had adequate management data and fiscal accounts been thoughtfully accrued by Yale administrations over the years, long-term plans and policy analyses could have been attempted which would have resulted, among other benefits, in further improvements in both the accuracy of this information and its relevance to the choices Yale faces. The record is far from being always clear, but the committee found few documents on financial planning in the university, and most of these dated from the brief interregnum of the Gray administration. The annual Report of the Treasurer summarizes our knowledge of Yale's financial health, and appears designed to satisfy only minimum accounting standards required by a privately-held corporation, while providing no clue as to the meaning of the ups and downs of the highly aggregated totals. Only the most cursory interpretation of the university accounts is reported, and planning documents with budgetary and personnel projections of more than a year's duration, if they existed at Yale, have remained confidential. Timely decisions on the basis of actual income and expenditure date are unimaginable, given the slow, centralized accounting conventions that have been followed at Yale, and the lack of meaningful, disaggregated, functional budgetary accounts.

Table 6.1

Yale University

Operating Income and Expense, 1967-68 to 1976-77

($ in Millions)

	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
A. Income										
Term Bills	$ 20.1	$ 22.1	$ 26.0	$ 27.4	$ 31.0	$ 34.2	$ 36.6	$ 40.5	$ 46.1	$ 49.9
Grants & Contracts	34.3	39.6	42.7	45.9	49.2	52.8	54.0	60.2	64.8	70.2
Medical Services*	12.3	13.8	17.9	15.7	18.7	8.0	9.3	12.2	15.2	18.4
Other Income						9.5	12.7	14.1	16.3	20.1
Sub-Total	$ 66.7	$ 75.5	$ 86.6	$ 89.0	$ 98.9	$ 104.5	$ 112.6	$127.0	$ 142.4	$158.6
Income Availed of From:										
Investments **	$ 24.6	$ 28.0	$ 30.4	$ 31.7	$ 30.2	$ 31.9	$ 36.1	$ 34.3	$ 35.7	$ 34.8
Current Gifts	8.0	7.5	7.0	7.5	7.9	7.5	8.7	9.9	10.2	9.4
Sub-Total	$ 32.6	$ 35.5	$ 37.4	$ 39.2	$ 38.1	$ 39.4	$ 44.8	$ 44.2	$ 45.9	$ 44.2
Total Income	$ 99.3	$111.0	$124.0	$128.2	$137.0	$ 143.9	$157.4	$ 171.2	$ 188.3	$202.8
B. Expenses										
Faculty Salary Expense	$24.0	$ 26.0	$ 31.3	$ 31.5	$ 32.1	$ 33.2	$ 34.6	$37.1	$ 42.7	$ 46.1
Staff Salary & Wage Expense	26.3	30.2	33.0	35.9	37.8	41.7	45.0	49.6	54.0	60.5
Employee Benefits	4.9	5.8	6.7	7.7	8.1	8.9	11.2	11.2	12.4	13.5
Student Aid	11.3	13.6	15.0	15.1	15.1	15.8	15.3	15.8	19.1	21.0
Utilities	1.9	2.1	2.2	2.9	3.5	3.9	6.2	8.8	8.9	10.1
Books	2.6	2.5	3.3	2.8	2.3	2.6	2.9	2.8	3.1	3.1
Goods & Services	23.7	26.0	27.8	27.6	29.6	32.7	34.7	38.7	42.8	46.5
Other Expenses	5.2	5.7	6.5	7.3	9.7	6.0	7.6	7.4	7.0	8.6
Total Expenses	$ 99.9	$ 111.9	$ 125.8	$ 130.8	$ 138.2	$ 144.8	$ 157.5	$171.4	$ 190.0	$ 209.4
C. Surplus/(Deficit)	$(.6)	$(.9)	$ (1.8)	$ (2.6)	$ (1.2)	$ (.9)	$ (.1)	$ (.2)	$ (1.7)	$ (6.6)

* Accounting changes make it impossible to separate Medical Services income from Other Income prior to 1972-73.

** Includes Endowment and Other Investment Income (Cash Management & Stock Loan).

Source: Achieving Financial Equilibrium at Yale, Yale University, Dec., 1977, Table D, p. 25.

Everyone with whom we spoke was of the opinion, which the committee shares, that the most serious failing of Yale's administration in the last several decades has been its neglect of financial administration of the university, an oversight that probably extends from the mismanagement of the endowment to the failure to introduce budgeting procedures that would have permitted Yale to predict and plan for the current financial crisis a decade earlier.

It is our understanding that during the Gray administration a beginning was made to reexamine the financial status of the university and eventually break down these historic accounts into more meaningful functional components or "cost centers" that generate income, deliver services, and incur expenses. The first product of this process was an analysis of the decade 1967/68-1976/77 and a set of projections for the subsequent five years, entitled Achieving Financial Equilibrium at Yale: A Report on the Budget and a Supplement of supporting materials. These documents were approved by the Corporation and published in December 1977 as a statement of Yale's financial problem and its planned response to the large 6.6 million dollar deficit incurred in 1976/77. Though this report on the budget was a major step forward in the sense that it tried to reconstruct for Yale on a consistent basis some of the income, expense and personnel figures that were required to make judicious management and planning decisions, it reflected how far Yale still has to go before it will have a financial accounting system that would facilitate modern management of its resources (see Tables 6.1 and 6.2).

Under a system with evolving "cost centers," the budgetary day-to-day decisions would be more frequently made within these responsible accounting centers, such as the Medical School or, perhaps in the future, the Yale Health Plan. These decentralized decisions would be guided by central budget guidelines and planning documents that specified service goals, but the central administration would leave to the cost centers the choices as to how best to allocate their resources. As expenses and income flows varied, and problems and opportunities arose, choices would be made at the level of the "cost centers" within the administrative hierachy about how best to provide the university with the agreed-upon services at least cost. The central administration would still establish planning target levels of transfers (positive or negative) from centralized unrestricted funds to cover anticipated current account deficits or surpluses and monitor developments throughout the university.

At the moment, the Treasurer's accounting categories or "schools" do not appear to provide meaningful budgetary units, for they lack an adequate explanation of how transfers are derived (inter-departmental credits and assessments). Only when these "transfers" are explained and publicly projected can one treat seriously the accounting category called "deficit or surplus". When the bottom-line totals become a meaningful measure of performance, efficiency, and unanticipated income and expense items, then these accounts can become a viable tool for financial accountability and management. When expenses outrun income items, an explanation should be sought. A deficit with a good explanation, such as the recent unanticipated and persistent increases in the price of utilities and oil, might be absorbed by the central administration into their contingency budget, and projected into subsequent years. But without a reasonable explanation, one might expect that the "cost center" would have to develop a plan for recovering the unanticipated cost from other efficiences. A surplus, conversely, should also be evaluated, and if it represented a gain in efficiency that had not been purchased by reducing the quantity or quality of services provided to the university, some share of the gain could remain with the program to be allocated internally toward high-priority items, and the balance of the surplus revert to the central administration.

The committee was told that financial accounts of the university were being prepared back to 1972/73 for eleven "schools" and that eventually departments would be distinguished within the largest school, i.e., Faculty of Arts and Sciences/Yale College/Graduate School.[1] Even after the budget has been disaggregated along functional lines, it is also essential to determine where discretionary funds exist. The current income and expenditure accounts should be broken down into restricted and unrestricted funds, and capital accounts should be treated separately. It is particularly useful to begin identification of auxiliary students services now provided by the university that ought to be more or less self-financing. For example, the Residential Colleges could be considered cost centers, as might the dormitory component of the Hall of Graduate Studies. Only when the smaller income and service units of the university are financially responsible can one hope to control costs, conserve resources, and strengthen the basis for the appropriate faculty salary growth in the future.

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1 The accounts we have seen refer for 1972/73 through 1976/77 for FAS/Yale College/Graduate School; ISPS; SOM; Divinity School; Medical; Law; Architecture; Sacred Music, Music, Forestry and Nursing. Drama was missing from our historic accounts, perhaps as an error, since the Report of the Treasurer 1977/78 indicates this is a budgetary account unit. (pp. 30-37)

Though a requisite Office of Finance with its executive agent, the Financial Vice President, now seems prepared to construct and coordinate the modern management staff Yale needs, the initial collection and preliminary analysis of these new basic data is a long and tedious process. Standards of reporting and analysis must now be raised; faculty as well as the Corporation and alumni have a right to expect of the new administration a steady flow of more detailed and informative budgetary documents, financial plans, and analyses of alternatives. The first public evidence that the budgetary and planning process within the university is being elaborated informatively and opened to review by the entire faculty can be found in the 1978/79 Operating Budget, which reached the committee in January 1979, too late for its review. The new Operating Budget appears to represent a substantial improvement in university budgetary accounts; in particular it provides greater detail and justification of its figures by school unit, e.g., Tables F-1 and F-2. It explains the accounting bases for interdepartmental credits and transfers, and it explicitly recognizes in a comprehensive manner the distinction between restricted and unrestricted income sources.

Restricted and Unrestricted Income Accounts

If budgetary items as reported in the past Treasurer's Reports are rearranged, the more stringent nature of Yale's financial circumstances becomes somewhat clearer. A decade ago in 1967/68, endowment yield and gains represented 25.8 percent of Yale's income, but in 1977/78 the share is roughly half as large, or 13.3 percent of income. The decline in endowment income relative to other current sources is noted by virtually all private universities as a result of inflation and the recent performance of financial markets. It would appear unrealistic to envision more than holding the current share of endowment income constant by maintaining its growth in real terms as university expenditures increase in real terms.

Perhaps more important than the overall budget is the unrestricted budget that is not tied to particular sponsored activities or obligated for the support of particular functions, for these unrestricted income sources provide the latitude for setting priorities independently and responding to special opportunities. Table 6.3 shows that unrestricted income represented 45 percent of Yale's total income last year. Endowment yield and other investment income represented 8.2 percent of the unrestricted sources of Yale income, whereas indirect cost recoveries on grants and contracts (government and non-government) represented, even at the depressed current levels, 14.4 percent of the unre-

Table 6.2
Actual and Proposed University Budgets of Operating Income and Expenses for 1976/77 through 1978/79

Fiscal Year	1976-1977 Actual	1977-1978 Estimated Actual	1978-1979 Proposed	1976-1977 Actual	1977-1978 Actual	1978-1979 Budget
Date of Publication	10/77 (1)	4/78 (2)	4/78 (3)	1/79 (4)	1/79 (5)	1/79 (6)
Income						
Term bill	49.9	52.7	59.7	49.9	52.9	59.6
Grant and Contract	70.2	72.9	77.8	70.2	73.2	78.3
Medical	18.4	19.6	21.4	18.6	21.3	21.0
Other Current Income	20.1	21.0	21.9	21.6	22.7	23.3
Endowment Yield and Gains	34.8	31.1	30.7	29.9	29.0	30.8
Other Investment Income		5.0	4.8	3.1	3.4	4.5
Gifts for Current Use	9.4	9.4	9.8	9.4	14.0	10.1
Total Income**	202.8	211.7	22	202.7	216.5	227.6
Expenditures						
Faculty Salaries	46.1	51.6	55.0	47.6	51.6	54.7
Staff Salaries	58.0	59.5	64.1	59.0	59.5	63.5
Employee Benefits	13.5	14.9	16.1	13.5	14.0	15.5
Student Aids	2.35*	22.7	24.2	21.0	22.3	23.5
Utilities	10.0	9.9	10.9	10.1	9.9	10.9
Books	3.1	3.6	3.7	49.5	49.6	50.1
Goods and Services	46.5	43.1	45.5			
Other Expenses	8.6	8.4	12.0	8.6	11.6	13.4
(incl. contingencies)		(1.4)			(2.3)	
Total Expenses**	209.4	213.7	231.4	209.3	218.4	231.6
Surplus/(Deficit)	(6.6)	(2.0)	(5.5)	(6.6)	(2.0)	(4.0)

*Includes student wage expenses ($2.5m. in 1976/77).

**May not sum to totals because of rounding.

Sources: (1), (2) - Table 6.1.
(3), (3) - The Proposed 1978/79 Budget, Yale University, April 1978, Table III, p. 19.
(4) -(6) - Yale Alumni Magazine and Journal, December 1978, p. 10

Table 6.3

Yale Income Sources 1977-1978

	Unrestricted Income	Restricted to particular functions	Total Income
Continuing Income from Investments			
Endowment Yield	6.4	23.0	29.4
Other Investment Income	1.9	1.5	3.4
Gains and Losses on Investments	-	(-2.9)	(-2.9)
Other Income	11.4	8.4	19.8
Other Increases	-	.9	.9
Investment Income	19.7	30.9	50.6
Current Income for Services			
Student Term Bills	52.6	.3	52.9
Patient Services	2.4	18.9	21.3
U.S. Government Research			
Direct Cost		41.9	61.6
Indirect Cost	14.0		
U.S. Government Fellowships	-	5.7	
Non-U.S. Government			
Direct	-	11.0	11.6
Indirect	.6		
Gifts for Current Use	12.0	15.2	27.2
Current Income	81.6	93.0	174.6
TOTAL	101.3	123.9	225.2

Source: Derived from Report of the Treasurer 1977-1978, Yale University, 1979, pp. 16, 20.

stricted income available to Yale. Although tuition and room and board were reported as constituting the majority of unrestricted Yale income--52 percent in 1977/78 --this is certainly an overstatement, for these payments are in fact obligated to pay for housing, food, and related services, in addition to their yield in unrestricted funds to be allocated among the university's competing instructional and other requirements, such as faculty and staff salaries.

To make the comparison of magnitudes in another way, indirect cost recoveries from research and contract activity represent 28 percent as much as total faculty salaries. If this margin of external support is to grow proportionately in the university, it can make a substantial difference in the size of the unrestricted budget the university allocates. To take another example, reallocation of gifts from endowment to current use is not a clear gain, for it reduces future investment income in order to obtain higher current income today. But transfers of gifts from restricted to unrestricted current account would appear highly desirable and should undoubtedly be strongly encouraged among beneficiaries in this period of austere budgets at Yale.

Faculty Salary Share in the Budget

One dimension of faculty status that gained attention after the Blum-Pelikan report [2] was the declining share of faculty salaries in overall expenses at Yale. Although we have tried to determine the consistency of the data reported on faculty salaries, the only data available are included in Tables 6.1 and 6.2 and the series on faculty salary share (exclusive of fringe benefits, which have fallen since 1973/74) that these data imply is summarized in Table 6.4. The downward trend in faculty share from 1969/70 to 1976/77, as reported in the Budget Report, reveals a 12 percent deterioration from 24.9 to 22.0 percent. For reasons that are not explicitly reported, the restated 1976/77 income accounts reported in the December issue of the Yale Alumni Magazine and Journal have allocated an extra $1.5 million to faculty salaries, representing physicians in the Yale Health Plan and certain administrative staff also holding faculty appointments, who in previous years were counted as non-faculty staff.

Without entirely reconstructing the personnel and payroll accounts in a consistent manner over a period of time, which is a task that proved to be

2. Report of the Committee on the Future of the College and the Graduate School, and Appendix, Yale University, December 11, 1972.

Table 6.4

Faculty Salaries as a Share of Yale University Expenses:

1967/68-1978/79

	Percentage Share of Faculty Salaries in Yale Total Expenses	Source
1967-1968	24.0	Table 6.1
1968-1969	23.2	Table 6.1
1969-1970	24.9	Table 6.1
1970-1971	24.1	Table 6.1
1971-1972	23.2	Table 6.1
1972-1973	22.9	Table 6.1
1973-1974	22.0	Table 6.1
1974-1975	21.6	Table 6.1
1975-1976	22.5	Table 6.1
1976-1977	22.0	Table 6.2, Col. 1
Restated 1976-1977	22.7*	Table 6.2 Col. 4
Estimated 1977-1978	24.1	Table 6.2 Col. 2
Actual 1977-1978	23.6	Table 6.2 Col. 4
Proposed 1978-1979	23.8	Table 6.2 Col. 3
Current 1978-1979	23.6	Table 6.2 Col. 5

*$1.5 million of staff salaries reallocated to faculty category including physicians at Yale Health Plan and Associate Deans of Law School.

Table 6.5

Full Time Equivalent Staff of Yale University
in Selected Budgetary Units, 1974/75 and 1977/78

	Manager. Prof. Staff	Clerical & Tech. Staff	Service & Maint. Staff	Total Staff
Administration				
University General				
1974-75	2.0	2.5	-	4.5
1977-78	-	.5	2.0	2.5
President's Office				
1974-75	7.3	10.0	-	17.3
1977-78	9.5	7.0	3.0	19.3
Treasurer's Office				
1974-75	88.0	115.7	-	203.7
1977-78	77.5	131.7	-	209.2
Secretary's Office				
1974-75	10.6	13.4	-	24.0
1977-78	8.5	9.0	-	17.5
Inst. Development - Campaign				
1974-75	68.8	96.0	-	164.8
1977-78	119.0	117.8	1.0	237.8
Academic Services				
Provost 1970				
1974-75	5.5	6.0	-	11.5
1977-78	10.0	7.0	-	18.0
Personnel 1970				
1975-76	25.0	29.1	-	54.1
1977-78	23.0	18.0	-	41.0
Admissions & Financial Aid				
1974-75	22.9	29.9	-	52.9
1977-78	19.0	26.0	-	45.0
Other				
1974-75	17.5	20.1	-	37.6
1977-78	25.9	34.3	-	60.1
Graduate School (FAS)				
1974-75	9.0	26.0	-	35.0
1977-78	7.8	17.0	-	24.8
FAS other than Graduate School				
1974-75	150.4	471.0	-	621.4
1977-78	174.0	377.6	38.8	590.4
University Total (not only above)				
1974-75	1382.3	2613.0	937.6	4932.9
1977-78	1565.2	2541.6	952.8	5059.6

Source: Office of Institutional Research, FTE Accounts, 1978.

Table 6.6

Census of Yale Employees, December 31, 1970

	Manager. & Prof. Staff	Clerical & Tech. Staff	Service & Maint. Staff	Total Staff
Senior Officers	21	36	-	58
Administration				
President	10	19	-	29
Treasurer	60	143	-	203
Secretary	29	81	-	110
Inst. Development	14	15	-	29
Academic Services				
Provost Admin. (plus 8 faculty)	15	21	-	36
Undergraduate Admin. (plus 11 faculty)	39	37	-	76
Graduate School Admin.	9	28	-	37
FAS other than Graduate School	207	455	-	662
University Total (not only above)	1393	2453	1025	4871

Source: Office of Institutional Research, Yale University, "Census of Yale Employees on December 31, 1970", September 15, 1972.

beyond the committee's capacity, it is clear that the "share of faculty salaries" in Yale expenses includes somewhat different groups over time, and that recently these compositional changes have biased the reported share upwards. It is also clear from section 4 above that had faculty fringe benefits been combined with salary (staff fringe benefits have risen more rapidly than those of faculty), the faculty compensation share would have declined still more rapidly.

But data on shares alone should not be expected to answer the more complicated question of whether the administration has performed satisfactorily its job of conserving Yale's resources and controlling expenses in all areas, in order to provide in part a competitive margin for faculty compensation. Only if we knew how the share of faculty salaries and shares of other expenses, consistently defined, changed over time at Yale and other comparable institutions would we be justified in interpreting distinct changes in the composition of Yale's expenses as evidence of excessive or deficient spending.[3] Though more analysis of Yale's expenditure pattern is fully justified to help identify priority areas for economizing in the future, it is the committee's view that faculty status is more directly and more accurately appraised in terms of Yale's salary and fringe benefits per faculty member by rank compared with those paid at other universities.

The Size and Composition of Yale Personnel

Having recognized how difficult it would be for our committee to analyze these aggregate income and expenditure accounts sufficiently to develop legitimate policy recommendations, the committee took on what appeared to be a simpler task of identifying trends in the "numbers and compensation of those employed (by the university) in various personnel categories" (original FAS motion establishing Committee). Personnel records of Yale before 1974/75 are incompatible by job types and budget units with the payroll "man file" used

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3. In the last few years one of the Federal Higher Education General Survey (HEGIS) has included a segment on financial account which tries to obtain information on income sources and expenditure items from all institutions on a comparable basis. A request to AAUP or HEGIS might obtain these accounts for a comparison group of institutions that would facilitate the analysis of expenditure shares and their change at Yale. Date for only 1976/77 could be obtained by the committee.

thereafter.[4] Table 6.5 contains full-time equivalent personnel breakdowns as reported in this recent period for the central administration and several other administrative offices in Yale College and the Graduate School. From 1974/75 to 1977/78, during the Campaign for Yale, one might note the rapid staff growth for the Institutional Development Office, from 165 to 238. The Treasurer's Office staff (now Office of Finance) remains at about 200, even though computerization of the university accounts was completed in this period. Employees in the officesof the Graduate School and the Secretary declined from 35 and 24 to 25 and 18, respectively. Most of the growth of 183 staff classified at the managerial and professional level was in the professional schools and research centers as well as the Campaign for Yale.

The only earlier data on Yale's personnel was a "census" taken from the payroll file as of December 31, 1970. These data, summarized in Table 6.6, are not based on full-time equivalence. But this problem should not be particularly serious at the managerial and professional level, though it might be of greater importance for wage earners in maintenance and services and part-time appointments at clerical and technical levels.

These tables suggest that the number of managers and professionals employed by Yale in December 1970 was 1393, versus 1382 in 1974/75. It was apparently during the 1960s that Yale's administrative staff increased rapidly, but we are unable to document the magnitude of that change here. For example, the creation of Residential College Deans in 1963 added a whole new tier of personnel to the colleges. In 1970 the Office of Institutional Development counted only 29 senior staff, and may not have included all the functions that were subsequently concentrated in this budget unit by 1974/75, when it employed 165 full-time persons. The President's Office under President Brewster had a staff of 29 in 1970, but in 1974/75 only 17 remained. The other striking change is the decline in the Secretary's Office from 110 to 24, and the Provost's Office from 36 to 12. A historian of the Personnel office would be needed to characterize jobs, trace and reallocate persons by job types which

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4. For example, Table C of the Budget Report provides a very gross set of categories of Yale personnel in "Administration." The definition of Administration used here is, however, one that the committee did not find satisfactory. It excludes the Provost's Office, the Office of the Deans of Yale College and the Graduate School, Grants and Contracts, Personnel, and other academic services. Only a few of these administrative clusters can be separately distinguished in the breakdown of personnel for recent years that is being prepared by the eleven school budget centers.

would be stable through changes in organizational structure, and probably smooth somewhat the apparent trends in personnel levels. The exception to an overall stability would undoubtedly remain the growth of the Campaign Office, which is presumably a transient phenomenon. For the most part, the date since 1970 do not confirm numerical growth in Yale's administrative staff. As for the salary levels of this numerically constant group, the data base at Yale does not permit us to answer the question of how rapidly they have grown.[5]

Another possible reason for Yale's financial problems, pointed out by Yale administrators, is the light teaching load of Yale faculty and the low student/faculty ratio that this implies. It proved easier to get series over time on the numbers of faculty and students than on the staff. The AAUP series for ladder faculty has been used to measure changes over time, but this is probably not adjusted for share of time spent on instructional duties excluding administrative and research time. Nor is it clear whether the series on students has been developed from a consistent and reasonable definition of full-time equivalence of student years. But for what they are worth, data on the student/faculty ratio from 1966/67 to 1977/78 are shown on Table 6.7. In contrast to the expectations of administrators and the fears of faculty, the student/faculty ratio has drifted upwards about 15 percent in the last decade. Given the data base at Yale, it would be hard to determine what groups within the faculty were responsible for this increase in student/faculty ratio. Similar trends are noted in higher education elsewhere, as one might expect in a period of austerity budgets.

Comparison in student/faculty ratios across universities is hazardous, for not only do statistical differences in counting conventions influence the comparison, but there is also the problem of how to combine undergraduate and graduate students. Table 6.8 simply adds graduate students in residence and four times the number of B.A.s conferred to obtain the "number of students." Faculty are defined as either regular ladder appointments or all teachers, according to data Yale provided to a meeting of Provosts. By this measure, the University of Chicago and Princeton have lower student/faculty ratios than

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5. The top two dozen officers of the Corporation are not even today reimbursed by the Payroll Office so their salaries are not included in payroll summary statistics.

Table 6.7

Undergraduate and Graduate Student/Ladder Faculty Rates
(excluding Medicine and Nursing)

	Students	Ladder Faculty	Ratio
1967-68	7,685	791	9.7
1968-69	7,669	791	9.7
1969-70	8,273	806	10.3
1970-71	8,205	824	10.0
1971-72	8,125	784	10.4
1972-73	8,358	766	10.9
1973-74	8,448	785	10.8
1974-75	8,584	776	11.1
1975-76	8,683	786	11.1
1976-77	8,681	806	10.8
1977-78	8,744	799	10.9
1978-79	8,838	760	11.6

Note: Number of full-time or part-time students includes only degree students in residence and excludes special students and Yale College Summer Term students.

Sources: Office of Budget Director, Yale University, Exhibit E. Background data prepared for Budget Report.
Survey of Yale University Registrars, 1977-78.
Ladder faculty are based on annual AAUP Reports, including discontinuing faculty.

Table 6.8

Number of Students and Faculty by Category 1976-77,
Selected Private Universities

School	BAs Awarded 3 yr. Average (1)	Graduate Students in Residence (2)	Estimate of All Students (1) 4+(2)# (3)	Regular Ladder Faculty (4)	Total Instructional Staff (5)	Student/ Faculty Ratio## (6)
Yale	1222	2224	7112	592	632	12.01 [11.25]
Chicago	481	2586	4510	534	570	8.44 [7.91]
Columbia	775	3091	6191	376	477	16.47 [12.98]
Harvard	1507	1948	7976	443	509	18.00 [15.67]
Princeton	807	960	4188	459	527	9.12 [7.95]
Stanford	1291	1987	7151	542	*	13.19 [*]

*Data not available on non-regular teachers at Stanford

Source: Compiled at University of Chicago for Provost's Meeting, 27 October 1977.

4 times the number of BAs awarded (col.1) plus the number of graduate students in residence (col. 2).

All students divided by regular ladder faculty (col. 4); in brackets, all students divided by total instructional staff (col. 5).

Table 6.9

Percentage Distribution of Teachers by Rank 1976-77,
Selected Private Universities

School	Professor (1)	Associate Professor (2)	Assistant Professor (3)	Instructor (4)	Other Non-regular Teachers (5)	Total Numbers (6)
	Percentage of Total					
Yale	44.7	13.4	33.0	2.4	6.4	632.3
Chicago	48.2	20.7	21.0	3.9	6.2	569.7
Columbia	45.0	8.2	24.8	.8	21.2	477.2
Harvard	55.0	-	29.9	2.1	13.0	509.4
Princeton	41.4	8.9	30.0	6.8	12.9	527.0
Stanford	52.6	17.3	26.4	3.7	n.a.	541.9

Source: Compiled at the University of Chicago for Provosts Meeting, 27 October 1977.

Yale, and both have a larger proportion of graduate students than Yale. But Harvard and Columbia also have a larger proportion of graduate students and report a substantially higher student/faculty ratio. On the surface, these data suggest a wide range of student/faculty ratios is consistent with high-quality instructional environments. To attach more significance to these numbers would require a lengthy study of how instructional faculty equivalents and students are actually counted in each university.

In considering how to live with the Corporation's prescribed budgetary retrenchments in the years ahead, it seems appropriate to stress the unavoidable trade-off between faculty size, composition, and economic status of the faculty. Fifty years ago the AAUP chapter at Yale conducted a study of faculty's economic status and observed:

> The faculty represented by the department chairmen, appear before the university authorities practically always as advocates of expansion. The university authorities, charged with the appointment of its income, are thus placed in the position of being able to promote salary increases only in the face of the opposition of the faculty itself, and the faculty finds itself standing in the way of its own advancement in salary...On a given instructional budget, any method of teaching involving a larger faculty involves also smaller salaries. [6]

Our data do not permit us to follow faculty retrenchments at Yale and elsewhere in much detail, but several other schools appear to have cut their faculty size more than has Yale. Harvard appears to have cut 11, 22 and 21 percent of their faculty at full, associate and assistant professor ranks from 1970/71 to 1977/78 (Table A-4). Chicago reduced its assistant professors by a third, while increasing slightly the number of faculty at higher ranks. Yale also sharply retrenched in the early 1970s, when from 1970/71 to 1974/75, the number of assistant professors declined 24 percent and when a 4 percent decline in the number of professors seems also to have occurred, according to AAUP data. Yale University and its faculty might today be in a better financial position if this early attrition in faculty numbers had been sustained. According to the record, however, Yale faculty numbers began to grow again, and from 1974/75 to 1977/78 the number of assistant and full professors grew 22 percent and 6 percent respectively, while associate professors lost another 20 percent (Table A-4).

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6. Incomes and Living Costs of University Faculty, (eds.) Y. Henderson and M.R. Davie, New Haven: Yale University Press, 1928, pp. 92-93.

The lack of a long-term plan behind Yale's erratic response to the changing market for graduate students and the tightening financial position of private universities might have led to Yale's faculty becoming "tenured up" or concentrated in the upper-tenured, older professorial ranks. According to the data in Table 6.9 (for FAS, or the AAUP date in Table A-4), it does not appear to be the case that as of 1976/77 Yale had an unusually high proportion of its faculty in senior ranks. Whether one includes or excludes non-regular faculty, Yale appears to have among the lowest proportion of its faculty at the rank of full professor and among the highest at the rank of assistant professor.[7] This youthful balance would appear to be desirable on several grounds. In a period when growth and turnover of the scholarly community in academia is going to be curbed, it is important to maintain the flow of new ideas, methodologies, and techniques into an instructional and research faculty of first quality. Moreover, the compensation of assistant professors is about half that of professors, suggesting a somewhat lower cost of instruction when a youthful age composition is maintained. But the task of retrenchment spread evenly across all ranks clearly will be difficult to achieve in the future, particularly at a time when legislation is extending the retirement age for universities.

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7. If one excludes non-ladder faculty, Yale has the highest proportion of assistant professors and the lowest proportion of professors in this group (Table A-4), displacing Princeton on both counts.

7. The Budgetary Process and Faculty Salaries

The faculty asked the committee to inquire into the budgetary process, beginning at the most general level and moving down to the determination of individual faculty salaries. We have talked to members of the previous administration: the Provost, the two Deupty Provosts, the Deans of Yale College and the Graduate School, and a number of Departmental Chairman. The picture we get of the process in effect in the previous administration is as follows: Planning for the budget began in the Provost's Office a year and a half in advance. By September, twenty-one months before the start of the fiscal year, assumptions had been made about salary and tuition increases, levels of inflation, energy needs, etc., and projections worked out of total income and expenses. Since projected expenses always exceed income, the process of cutting then began, and since salaries are a more controllable item than many others in the budget, much of the cutting was often done there. By December or January, the general decisions that had been made were translated down to the School and departmental level. In the spring, Chairmen were asked to indicate expected leaves, resignations, and retirements in their department and were given an opportunity to present their case for one-year replacements and new appointments to vacated ladder positions. These requests were discussed by the Executive Committee of the Faculty of Arts and Sciences (the President, the Provost, the two Deans, and sitting with them, the Directors of the Divisions), with the decision being made by the President and Provost.

The budget, which was normally sent to Chairmen in November, consisted of three parts: Block I (faculty salaries), Block II (non-faculty salaries), and Block III (all other expenses). The faculty salary budget was divided into two pools, one for full professors, the other for everybody else. (In some years the division had been between tenured and non-tenured faculty.) A percentage increase was set for each pool. The reason for the division is that if the pools were not distinct from each other, some Chairman might tend to favor the tenured faculty at the expense of the non-tenured, and others the reverse. The percentages allocated to the two groups were normally not the same but reflected the Provost's view of the greatest need. In the instructions to the Chairmen, there was sometimes a greater and sometimes a lesser emphasis on the need to make merit discriminations as opposed to across-the-board increases. In recent years the Provost had sought increasingly to emphasize merit. Chairman were required to make specific recommendations of salaries for all faculty below the rank of full professor, and they were normally re-

quested or invited to make recommendations for full professors. Most Chairmen seem to have done this on their own, though a few occasionally consulted colleagues. Generally Chairmen were reluctant to make sharp merit discriminations and tended toward uniform across-the-board increases. They were asked to give reasons in support of their recommendations, particularly in the case of tenured faculty. If specific dollar recommendations were not made for full professors, then verbal recommendations were especially important. Chairmen's recommendations were reviewed by the Budget Committee of the Faculty of Arts and Sciences (Provost, the two Deupty Provosts, and the two Deans). In most cases the Chairmen's recommendations for non-tenured faculty were accepted, unless there were general Yale College or university services known to the Budget Committee of which the Chairman was not fully aware. Recommendations for tenured and full professors (if made) were more frequently modified; it is said that the revisions were generally upwards. The Chairman could then review the final salary recommendations with the Deputy Provost and negotiate any adjustments he felt were warranted.

Salaries for new appointments at the assistant professor level were set for the entire rank by the Provost's Office. Whether a Chairman was able to go above the minimum in hiring was determined by the Provost in consultation with the Chairman on the basis of the market conditions in his discipline. The salaries of new senior professors were negotiated by the Chairman with the Provost and were determined both by the degree of distinction of the candidate and by what was needed to bring him to Yale. Faculty members with outside offers often attempted to negotiate salary raises either directly with the Provost or through the Chairman.

Some of the problems that Chairmen report having experienced with this budgetary process are: (1) Since the percentage increase for the pool was normally small, the Chairman had very little flexibility in the granting of merit raises, for even a small merit increase for one person meant a comparable decrease for somebody else, perhaps to well below the level of the rate of inflation. Some Chairmen proposed dividing the increase into a partial cost-of-living adjustment component and a merit component; others felt this further limitation on the Chairman's options was undesirable. (2) Some Chairmen were reluctant to make merit discriminations among their own colleagues and felt that there might be established some system of broader but informed consultation among an executive committee within departments. Several suggested a divisional committee, comparable to the Senior Appointments Committee, for

the senior professors and either a departmental or a divisional committee for the junior professors. Several were skeptical about merit raises altogether. Other Chairmen felt very strongly that merit discriminations can be made with reasonable accuracy and that the Chairman is in the best position to make them. Whatever the practice of departmental Chairmen in preparing their salary recommendations, the Committee proposes that the Provost establish two faculty salary pools, one for merit raises planned across departments, as a whole, and one planned departmentally for across-the-board increases. As proposed earlier, the Chairmen should be required to make special appeals to the Provost to exercise a claim on the centralized salary pool established for merit raises. In this way, merit raise for one member of the faculty need not come out of the pocket of others in his or her department. (3) Increases in the entry-level salaries for assistant professors have resulted in a "compression" at the bottom of the salary scale--that is, a narrowing of the salary gaps among junior faculty with varying years of experience at Yale--which is very difficult to rectify with the small amount of money available. Experience is thereby not adequately recognized and able junior faculty are prematurely lost to Yale. (4) The use of percentile rather than a fixed-dollar increase tended to widen unduly the gap between those with the highest and those with the lowest salaries without regard to current merit. (5) In the case of joint appointments, salaries had to be negotiated between two Chairmen or Deans, whose estimates of the individual's relative standing may be very different.

The Committee anticipates that the new administration will inform the faculty in due course of modifications to this salary-setting process that has been in effect heretofore at Yale

Faculty Participation in the Planning and Allocation of the University Budget

Recognizing that the university's academic programs are inseparable from the budgetary decisions made by the administration, the committee feels that the faculty, on principle, should have some regular and systematic means to participate in the planning and allocation of the university's resources. Such an arrangement would benefit both the faculty and the administration, assuring the former that their interests were being represented and providing the latter a broader consensus for the difficult decisions that must be taken in the coming years.

To increase communication between the faculty and the administration on budgetary and other matters, we propose two possible mechanisms, either or both of which may be appropriate.

(1) The Council of Chairmen is the faculty group with the most intimate working knowledge of the problems of programs and budget. They also constitute a group to which all members of the faculty have access. Therefore, we propose that the Chairmen of the FAS departments select an Executive Committee of four members, one from each of the Divisions, to sit on the Budget Committee in order to advise on faculty concerns.

In addition, we strongly urge the Provost to submit annually to the faculty as a whole a report on the state of the university and its long-range goals. At the same time a more detailed and confidential report should be submitted to the Chairmen of the FAS departments. Then, after the faculty has had an opportunity to examine the report and submit any views they may have to their respective Chairman, the Provost should meet with the Council of Chairmen and hear its recommendations before making any final decision on the budget. We recognize that the ultimate authority for budgetary recommendations to the Corporation must rest with the administration; however, we also feel that the Provost should justify any decisions taken contrary to the consensus of the Council of Chairmen. By consulting with the Executive Committee of the Council of Chairmen and by presenting the recommendations of the Budget Committee to the Chairmen, the Provost could, we think, allay suspicion over budgetary decisions and reduce conflicts. More open communication during the planning and decision phases of the budgetary process will contribute greatly to renewed trust of the faculty in the administration.

(2) We recommend that the Divisional Committees be given more responsibility for overseeing the budgetary processes in their constituent departments. Again recognizing the authority of the administration to make the final budgetary recommendations to the Corporation, we recommend that the Divisional Committees be asked to comment and advise on the overall budgets for departments. Such matters as allocation policy for annual salary increases, review of leave requests from the faculty, and recommendations on new or suspended positions should be added to the present review responsibilities on promotion and tenure decisions. We do not feel that the Divisional Committees should as a standard practice review individual salaries or salary increases, but rather advise the Provost on faculty views of Divisional policies and needs.

We recommend also that the Chairman of each department be invited to the meeting of the FAS Budget Committee when his proposal is to be discussed, so that he can explain and defend his department's recommendations.

Finally, we recommend that a permanent Committee on the Economic Status of the Faculty be established by the Faculty to monitor faculty compensation and working conditions relative to those at comparable institutions.

8. Conclusions and Summary

During the 1950s and 1960s, faculty compensation increased more rapidly than did that of the average worker. Yale also prospered in this era of academic expansion, sharply increasing faculty salaries as comparable institutions increased theirs. As the demographic tide turned in the 1970s, faculty compensation nationwide did not increase nominally at the rate of inflation; at most institutions, real compensation declined, while at Yale the deterioration after 1970/71 was exaggerated by cuts in fringe benefits. From 1970/71 to 1977/78 real compensation of Yale faculty, adjusted for inflation, declined by 16.7 percent for professors and assistant professors, and by 14.7 percent for associate professors. This decline of more than a seventh in real faculty compensation may be contrasted with the declines of about seven percent in faculty compensation at a group of six other major universities (Table 3.1).

One cannot predict with precision how far this process can go before Yale begins to incur substantial losses of its more productive and highly mobile faculty. But the limit must be approaching, if it has not passed. A major conclusion of this fact-finding committee is that Yale cannot expect to retain its 1970 position relative to its competitiors without a substantial increase in faculty compensation. Our figures suggest that a 10 percent increment in faculty compensation relative to that offered at other major universities would be a reasonable target for which Yale should budget in the early 1980s.

It is admittedly easier to portray this compensation gap, which is felt by all, than to describe where the resources are to be found to close it. The decade that has elapsed since the expansion of academia came to an end has not been used prudently at Yale. No sustained effort was made to prune inessential positions and to develop the institutions that might marshall Yale's resources more effectively, or even to motivate its many elements to economize on expenses while attempting to augment income. The slow task of accumulating information about Yale's performance and of designing ways to improve it has been undertaken only in the last year or two. Yale's chronic financial disequilibrium in the last decade was first documented in the Budget Report of December 1978. More adequate budgetary accounts were constructed and disaggregated information flows were expanded, which any well-managed institution of Yale's size and complexity would need to characterize and evaluate alternative policies, plan soundly within long-term constraints, and monitor and respond flexibly to unanticipated short-term developments. But such budgetary and management changes cannot make their full impact felt for several more years. It is appropriate

that the faculty actively participate now in the formulation of that evolving budgetary process. The faculty must exercise increased responsibility in defining university priorities and accept increased financial responsibility for translating these priorities into program and personnel decisions that will variously affect the diverse interests of faculty constituencies. This new budgetary process will have much to do with bringing Yale back into financial equilibrium, and with maintaining the competitive level of Yale faculty compensation in the future.

Half of the target increase of 10 percent in the compensation of Yale faculty should be allocated to bring fringe benefits up to the same level as that in most other institutions, equal to about 20 percent of salaries for tenured faculty and 17 percent of salaries for nontenured faculty. Today they stand at 15 and 12 percent, respectively (Table 4.1). Moreover, this recommended increment to faculty fringe benefits should be completed in the next two academic years; federal guidelines, which mandate no more than a 7 percent increase in wages and salaries, are apparently more flexible in permitting larger increments in fringe benefits such as would be required to achieve this target at Yale. Given the continuing progressivity of the federal income tax system, it appears generally desirable to index all forms of fringe benefits in the future to assure that fringe benefits remain roughly a constant proportion of faculty compensation, regardless of the vagaries of inflation. The faculty should then determine what combination of fringe benefits suits faculty interest, introduces the least inequities, and provides for the greatest possible flexibility to fit individual preferences.

The pension scheme for faculty requires immediate overhaul. Many of the assumptions that were the foundation for the current pension contribution formula are no longer realistic. In a reasonable effort to index pension contributions to avoid excessive growth in a period when faculty were unusually prosperous, Yale adopted a two-rate pension formula tied to the average worker's wage (which was then the Social Security FICA base). But the years that followed this "innovation" have witnessed a decline in the ratio of Yale faculty salaries to the average worker's wage, and, consequently, the pension index scheme adopted by Yale under these conditions has led to an erosion of the university's contributions to faculty pensions. Furthermore, the projections made in 1972 for real returns on pension annuities invested in either fixed interest notes (TIAA) or stock (CREF) now appear overly optimistic. Finally, the presumed growth in faculty real salaries has clearly been violated by Yale's

recent retrenchments that have been heavily borne by faculty salaries. In sum, the faculty need to determine a reasonable set of new assumptions for calibrating a new formula for determining university and faculty contributions to pensions; a range of such assumptions is proposed in Table 4.2 and compared with the original projections that have lately proven to be wide of the mark.

The pension scheme should also be modified to permit individuals to choose between the conventional current TIAA/CREF retirement plan and the new TIAA/CREF Supplemental Retirement Annuities, which have greater liquidity value. This flexible modification of Yale's fringe benefit package would have substantial appeal in attracting and retaining Junior faculty, a large fraction of whom do not seek to participate in Yale's current inflexible matching plan (Table 4.4, p. 33). There are also other fringe benefits that have been eroded by inflation, such as the "scholarship" plan; we would recommend indexing this scholarship payment to Yale's tuition. Other fringe benefits have become obsolete, such as the faculty Major Medical insurance, which has the remarkable ceiling coverage of only $15,000 per illness, whereas the nonfaculty, unionized staff receive fully paid coverage up to one million dollars. Leave policy is treated differentially across departments, with the result that this costly fringe benefit for the University is not shared equally. A priority leave scheme would increase the availability of outside leave monies and allow increases in salary without a substantial reduction in paid leaves of absence. Given the constant changes in legal interpretation of and restrictions on fringe benefits, a standing faculty committee should regularly review Yale's fringe benefit program, reporting to the Provost and the full faculty.

If the Yale Treasurer's Reports or other budgetary documents had broken down the university accounts and distinguished consistently the Faculty of Arts and Sciences (FAS) from the Medical School, it might have been noted that FAS research support obtained from outside sources has remained almost constant in nominal dollars during most of the last decade (Table 5.1, p. 54). In real terms, the dollars available to fund the direct costs of faculty research in the Faculty of Arts and Sciences have declined by a third, while Yale overall expenses increased one-fifth. Despite a doubling in overhead rates (indirect as a percentage of direct costs), the actual real dollars of indirect costs reimbursed in 1977/78 had increased only 15 percent above the level sustained in 1967/68. This loss of a crucial source of unrestricted income for the university must have contributed notably to the recent financial crisis.

To reverse the trend of deteriorating financial support for FAS faculty

research, the individual and departmental incentives for research must be strengthened, and the allocation of the gains from research must be used selectively to encourage high-quality research in all fields. Specifically we recommend the following: (1) faculty researchers should receive meaningful relief from instructional and administrative duties when their salaries are externally supported; (2) faculty summer research salaries and fringe benefits should be treated as they are during the academic year; (3) a tenth of recovered indirect costs should be returned to the originating research unit or department for discretionary research-related expenditures; (4) another tenth of indirect costs should be used university-wide to support the highest quality faculty research projects that are unable to secure outside funding; (5) in preparing to shift next year to a full direct cost base for recovering indirect costs, the faculty and administration should carefully reevaluate all Yale cost-accounting conventions to determine their incentive effects and reduce inequities across divisions and departments; (6) experimentation should be encouraged to discover less costly and perhaps less centralized methods of delivering research support services; and (7) an Office of Research Development should be established to help faculty secure support for their research and aid faculty in grant and contract management. A faculty Research Committee should advise this office, report regularly to the Provost, and report annually to the full Yale faculty.

Several of the institutional changes proposed by the committee last year to members of the new administration have been accepted and are now being implemented. A faculty committee on retirement was formed and their report is anticipated shortly. The Provost is appointing a faculty committee on fringe benefits and another on research. It is appropriate, however, for the faculty to record their expectations that these faculty committees will report in a regular fashion to meetings of the full faculty, as well as advise the Provost and the administration. It is also reported that Provost plans in the future to invite department Chairmen to attend the FAS Budget Committee meeting at which their department's budgetary proposal is considered. Finally, it was the intention of the Gray administration to establish the policy of an annual "state of the university" report by the President or the Provost that would survey the budgetary developments and interpret their implications for the faculty and university community in the coming year and five-year period. We encourage the establishment of such a report, as it might both improve understanding on the part of the faculty of the financial condition of the university and motivate

an articulate review within the administration of long range planning issues. Action is now awaited.

The way to avoid a recurrence of the events chronicled here is to establish a stronger shared responsibility between the administration and the faculty for the economic well-being of the university and its faculty. Decades of neglect by the administration of the financial management of the university can be singled out as the most obvious cause for Yale's current fiscal problems. But one might also ask why, during this extended period of time, the faculty did not exercise more leadership, define salient issues, chart alternative courses, and thereby change administrative policy sooner. For faculty actually to share responsibility with the administration for university planning and governance, the faculty will have to make heavy commitments of its time and become informed about detail that may not seem personally worthwhile. Without this measure of sustained effort on the part of the faculty, the administrative process at Yale may well relapse into its old patterns. A favorable sign that the administration at least recognizes the need for improved dialogue with the faculty is reflected in the increasing amount of information being released by the Office of Finance on the financial conditions of the university and the opening up of the planning process to wider faculty scrutiny. In a year's time the committee has identified some areas in need of change, and it urges that the full Yale faculty now establish a standing committee on the Economic Status of the Faculty to implement these changes and to coordinate the recommendations of other newly-constituted faculty advisory committees on Retirement and Faculty Age Structure, Faculty Fringe Benefits, and Research.

Appendix Table A-1

Faculty Relative to Average Worker Compensation

in the United States: 1904-1975

Calendar or Academic Year	Average Annual Compensation - All Civilian Full Time Employees		Estimated Average Faculty Compensation in Higher Education for Nine Month Academic Year		Ratio of Faculty to Average Worker Compensation
	Current Dollars	1967 Dollars	Current Dollars	1967 Dollars	(5) = (3)(1)
	(1)	(2)	(3)	(4)	(5)
1904	480	1778	1384	5126	2.88
1914	637	2102	1689	5574	2.65
1920	1338	2356	2507	4414	1.87
1923	1276	2492	2795	5459	2.19
1927	n.a.	n.a.	2989	5781	n.a.
1930	1387	2902	3106	6498	2.24
1932	1141	2860	2818	7063	2.47
1935	1157	2802	2722	6591	2.35
1940	1359	3153	2944	6831	2.17
1943	2020	3862	3251	6216	1.61
1946	2482	3959	3916	6246	1.58
1952	3590	4499	5116	6411	1.46
1961	5315	5899	8232	9137	1.55
1970	8409	7078	14093	11863	1.68
1975	12393	7470	19079	11500	1.54

n.a. not available

Sources: Howard R. Bowen, Academic Compensation, TIAA/CREF, New York, 1978, Tables A and D.

Appendix Table A-2

Associate Professor Salary Relative to Wages
Earned by 2000 Hours of Nonfarm Unskilled Labor

1908	4.52	1940	2.68
1909	4.69	1941	-
1910	4.80	1942	2.15
1911	5.01	1948	2.18
1912	4.87	1949	-
1913	4.55	1950	-
1914	4.59	1951	2.10
1915	4.44	1952	-
1916	4.05	1953	2.03
1917	3.39	1954	-
1918	2.36	1955	1.95
1919	2.13	1956	-
1920	2.31	1957	1.81
1921	3.14	1958	1.84
1922	3.74	1959	1.95
1923	3.44	1960	2.00
1924	3.37	1961	1.94
1925	-	1962	1.96
1926	3.43	1963	2.01
1927	3.39	1964	2.05
1928	3.48	1965	2.09
1929	3.46	1966	2.16
1930	3.50	1967	2.20
1931	3.72	1968	2.19
1932	4.22	1969	2.16
1933	-	1970	2.05
1934	-	1971	2.05
1935	2.93	1972	1.93
1936	2.98	1973	1.89*
1937	2.76	1974	1.87*
1938	2.72	1975	1.86*
1939	-	1976	1.82*
		1977	1.77*

*Old series on nonfarm unskilled wage discontinued and new series on private nonfarm wage began.

Sources: 1908-1972 - P.H. Lindert and J.C. Williamson, "Three Centuries of American Inequality", University of Wisconsin, Madison, Wis., 1977, Table A-3, No. 7.

1973-1977 - AAUP Bulletins for faculty, salary series, and private nonfarm wage rates from the Economic Report of the President, January 1978, Washington,D.C.

Appendix Table A-3
Sources of Expansion in Higher Education

Table A-3 decomposes approximately the decadal rate of growth in the number of Bachelor's college degrees conferred in the United States into that (6) which is due to growth in the population aged 20 to 24 (column 2), (2) that due to the increases in the proportion of that age group receiving college degrees (column 4), (3) that doe to the product of the growth rates of population and graduation rates (column 5). Population growth contributed to the growth of higher education during the 1900s, 1920s and 1960s, continuing into the 1970s. Declines in population of college age in the 1940s and 1950s were more than offset by the sharp postwar rise in higher education enrollment and graduation rates, and the number of college graduates increased remarkably in the 1960s, under the concurrent expansive demographic and enrollment trends.

Beginning in the 1980s, and already underway today at the college-entry level, the population of college age will decline. Moreover, enrollment rates have fallen since the late 1960s, perhaps as a consequence of the falling monetary returns of a college education. Though the population already born can be projected to college age with little error through the middle of the 1990s, college enrollment rates may vary. For illustrative purposes it is assumed here that graduation rates remain constant to the end of the century, whereas they may resume their upward trend before the 1990s. It is also possible that the influx of foreign students and the increasing number of adult and extension college students will bolster growth in the number of U.S. college students. Nonetheless, an absolute decline in the number of college students is probable, and it would be unrealistic to anticipate much growth before the end of the century.

Appendix Table A-3
Sources of Growth in U.S. Higher Education

	Growth in Population Age 20-24		Bachelors Degrees Conferred			
	Numbers	Proportion of Initial Year[1]	Proportion of age group in initial year[2]	Percentage Change in Proportion[3]	Interaction Population and Enrollment[4]	Proportionate Growth in Bachelors Conferred[5]
	(1)	(2)	(3)	(4)	(5)	(6)
1900-1910	1,721,000	.235	.0187	.0962	.0226	.354
1910-1920	221,000	.024	.0205	.378	.0067	.309
1920-1930	1,593,000	.172	.0262	1.149	.198	1.519
1930-1940	718,000	.066	.0563	.429	.028	.524
1940-1950	-106,000	-.009	.0805	1.337	-.012	1.316
1950-1960	-679,000	-.059	.1881	-.037	.002	-.094
1960-1970	5,297,000	.490	.1811	.428	.210	1.128
1970-1980[6] proj.	4,754,000	.295	.2587	-.072	-.021	.202
1980-1990[6] proj.	-3,739,000	-.179	.24[7]	.0	.0	-.179
1990-2000[7] prob.	N 0	.0	.24[7]	.0	.0	.0

Notes:

[1] Percentage growth in terms of initial census year total.

[2] Number of Bachelors or first professional degrees conferred as a percentage of one-fifth of the population age 20-24 in the initial census year.

[3] Percentage change in degree receiving proportion defined in fn. 2 above.

[4] Product of Col. (2) and Col. (4).

[5] Estimate of growth rate of college degree recipients which is equal to the sum of Cols. (2), (4) and (5).

[6] 1970 Census total age 0-4 and 10-14 respectively. Net immigration is assumed to offset mortality.

[7] The number of births from 1976 to 1980 is likely to be very similar to the number of births that occurred from 1966 to 1970. Again it is assumed the slightly lower mortality for the later cohort will be offset by higher immigration leaving the age group 20-24 about the same size in the year 2000 as it will be in 1990.

Sources:

Population, 1900-1950, Series A-75, p. 10, Historical Statistics of the United States, Colonial Times to 1957, Washington, D.C., 1960.

Bachelor Degrees, 1900-1950, Series H-327, Ibid;
1960-75, Statistical Abstract of U.S., 1977, p. 160.
Raw data reported in Table A.3-1.

Appendix Table A-4
Salary, Fringe Benefits, and Compensation, by Rank
For Yale and Selected Institutions: 1970/71 - 1977/78
(exclusive of medical and nursing schools)

		1970/71			1971/72		
		PROFESSOR	ASSOCIATE	ASSISTANT	PROFESSOR	ASSOCIATE	ASSISTANT
Yale	Salary ($000)	24.7	14.9	11.3	24.6	15.2	11.8
	Fringe (%)	15.2	16.9	17.0	17.3	19.4	18.2
	Comp. ($000)	28.5	17.4	13.2	28.9	18.2	13.9
	No. of Profs.	348	151	271	351	138	242
Harvard	Salary ($000)	22.8	15.4	11.8	23.6	15.9	12.4
	Fringe (%)	19.3	20.8	21.2	19.4	20.4	21.2
	Comp. ($000)	27.2	18.6	14.3	28.2	19.1	15.0
	No. of Profs.	577	120	278	494	101	227
Chicago	Salary ($000)	23.3	16.2	12.6	24.1	16.8	13.3
	Fringe (%)	14.3	14.4	14.5	14.0	14.0	14.0
	Comp. ($000)	26.6	18.5	14.4	27.5	19.2	15.2
	No. of Profs.	394	144	254	387	142	228
Princeton	Salary ($000)	21.8	14.5	11.6	21.9	14.8	11.7
	Fringe (%)	17.2	14.8	13.2	17.6	14.8	13.4
	Comp. ($000)	25.5	16.6	13.1	25.8	17.0	13.3
	No. of Profs.	262	98	194	266	95	176
Stanford	Salary ($000)	21.6	15.4	12.1	22.3	16.0	12.6
	Fringe (%)	15.9	16.2	16.1	18.2	16.7	17.1
	Comp. ($000)	25.0	17.9	14.1	26.4	18.7	14.7
	No. of Profs.	397	135	163	397	132	168
Columbia	Salary ($000)	21.9	15.0	11.6	22.2	15.7	12.0
	Fringe (%)	17.9	15.6	14.7	18.0	16.9	14.2
	Comp. ($000)	25.8	17.3	13.3	26.2	18.3	13.7
	No. of Profs.	437	161	239	436	146	250
Brown	Salary ($000)	20.8	14.7	11.7	20.8	15.0	12.1
	Fringe (%)	16.4	14.6	14.8	17.1	15.1	11.1
	Comp. ($000)	24.2	16.8	13.4	24.3	17.3	13.4
	No. of Profs.	210	117	122	219	93	114
Rochester	Salary ($000)	22.1	15.6	12.1	22.8	16.3	12.6
	Fringe (%)	15.6	16.3	16.4	16.1	16.1	16.3
	Comp. ($000)	25.5	18.1	14.1	26.5	18.9	14.6
	No. of Profs.	184	115	158	192	109	168
MIT	Salary ($000)	22.2	14.6	11.8	22.8	15.0	12.2
	Fringe (%)	16.6	16.9	17.7	17.5	17.7	18.6
	Comp. ($000)	25.9	17.1	13.9	26.8	17.7	14.5
	No. of Profs.	409	225	179	418	233	159
Michigan: Ann Arbor	Salary ($000)	20.6	15.0	12.3	21.6	15.8	13.0
	Fringe (%)	15.3	16.4	17.3	15.5	16.7	17.6
	Comp. ($000)	23.8	17.5	14.4	24.9	18.4	15.3
	No. of Profs.	752	386	390	787	387	394
Wisconsin: Madison	Salary ($000)[2]	19.3	14.1	11.7[2]	19.7	14.3	12.0[2]
	Fringe (%)	9.7	10.6	11.2	13.5	14.4	15.0
	Comp. ($000)	21.2	15.6	13.0	22.4	16.3	13.8
	No. of Profs.	815	557	967	842	599	999
California: Entire System	Salary ($000)	20.8	14.2	11.4	21.0	14.1	11.4
	Fringe (%)	11.9	12.2	12.4	12.0	12.4	12.6
	Comp. ($000)	23.3	15.9	12.8	23.5	15.8	12.8
	No. of Profs.	2194	1139	2087	2331	1177	1858
Consumer Price Index (1967 = 100)			116.3			121.3	

Appendix Table A-4
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		1972/73			1973/74		
		PROFESSOR	ASSOCIATE	ASSISTANT	PROFESSOR	ASSOCIATE	ASSISTANT
Yale	Salary ($000)	25.5	15.6	11.9	26.3	16.0	12.0
	Fringe (%)	16.6	15.9	14.1	17.3	17.2	14.8
	Comp. ($000)	29.7	18.1	13.6	30.9	18.7	13.8
	No. of Profs.	337	150	218	337	161	214
Harvard	Salary ($000)	23.7	17.0	12.3	25.7	17.2	13.7
	Fringe (%)	18.8	18.8	18.8	21.1	14.2	14.2
	Comp. ($000)	28.2	20.2	14.6	31.1	19.6	15.6
	No. of Profs.	493	90	212	510	110	228
Chicago	Salary ($000)	25.2	17.2	13.6	26.3	17.8	14.2
	Fringe (%)	14.5	14.5	14.5	16.8	16.8	16.8
	Comp. ($000)	28.8	19.7	15.6	30.7	20.8	16.6
	No. of Profs.	379	153	206	370	161	188
Princeton	Salary ($000)	22.8	15.4	12.1	23.8	16.3	12.4
	Fringe (%)	17.9	16.0	15.3	18.7	16.1	15.9
	Comp. ($000)	26.9	17.9	14.0	28.2	18.9	14.4
	No. of Profs.	266	88	169	277	83	173
Stanford	Salary ($000)	23.3	16.8	13.3	24.4	17.1	13.8
	Fringe (%)	17.7	17.2	18.0	19.0	18.7	19.8
	Comp. ($000)	27.4	19.7	15.7	29.0	20.3	16.5
	No. of Profs.	394	132	174	394	132	165
Columbia	Salary ($000)	23.6	16.5	12.7	24.5	17.1	13.1
	Fringe (%)	19.2	17.3	15.1	19.7	17.3	16.1
	Comp. ($000)	28.1	19.3	14.6	29.3	20.1	15.2
	No. of Profs.	437	153	229	449	131	227
Brown	Salary ($000)	21.4	15.5	12.3	22.3	16.1	12.7
	Fringe (%)	18.6	17.0	10.7	19.2	21.1	13.2
	Comp. ($000)	25.4	18.1	13.6	26.6	19.5	14.4
	No. of Profs.	220	97	107	232	86	109
Rochester	Salary ($000)	23.2	16.5	12.9	23.9	17.1	13.4
	Fringe (%)	16.8	17.3	17.1	17.5	18.0	17.9
	Comp. ($000)	27.1	19.3	15.1	28.1	20.2	15.8
	No. of Profs.	203	101	168	203	102	164
MIT	Salary ($000)	23.3	15.5	12.7	24.6	17.1	13.2
	Fringe (%)	18.0	18.7	19.6	18.4	18.4	19.5
	Comp. ($000)	27.5	18.4	15.2	29.1	20.2	15.8
	No. of Profs.	435	212	155	445	204	200
Michigan: Ann Arbor	Salary ($000)	22.6	16.6	13.5	23.9	17.6	14.3
	Fringe (%)	15.9	17.5	18.5	16.4	18.2	19.3
	Comp. ($000)	26.2	19.5	16.0	27.8	20.8	17.1
	No. of Profs.	825	405	385	906	430	426
Wisconsin: Madison	Salary ($000)	21.0	15.3	12.9	22.0	15.9	13.5
	Fringe (%)	15.0	16.4	17.3	14.7	16.8	18.0
	Comp. ($000)	24.2	17.8	15.1	25.2	18.6	15.9
	No. of Profs.	656	307	361	668	309	349
California: Entire System	Salary ($000)	22.8	15.6	12.7	24.1	16.6	13.7
	Fringe (%)	13.4	13.8	14.1	12.9	13.3	13.5
	Comp. ($000)	25.9	17.7	14.5	27.2	18.8	15.6
	No. of Profs.	2176	1122	1223	2362	1202	1213
Consumer Price Index			125.3			133.1	

		1974/75			1975/76		
		PROFESSOR	ASSOCIATE	ASSISTANT	PROFESSOR	ASSOCIATE	ASSISTANT
Yale	Salary ($000)	27.9	16.8	12.5	29.7	18.0	13.2
	Fringe (%)	14.8	13.5	11.8	15.0	13.8	12.0
	Comp. ($000)	32.0	19.1	14.0	34.1	20.5	14.8
	No. of Profs.	335	153	205	347	149	216
Harvard	Salary ($000)	26.9	18.5	14.0	29.5	19.6	15.1
	Fringe (%)	20.9	14.0	14.0	20.9	13.9	13.9
	Comp. ($000)	32.5	21.1	16.0	35.7	22.3	17.2
	No. of Profs.	509	103	214	492	117	230
Chicago	Salary ($000)	27.3	18.7	14.8	28.9	20.0	15.6
	Fringe (%)	17.0	17.0	17.0	17.0	17.0	17.0
	Comp. ($000)	31.9	21.9	17.3	33.8	23.4	18.3
	No. of Profs.	382	176	187	375	175	189
Princeton	Salary ($000)	25.6	17.4	13.1	27.1	18.4	14.0
	Fringe (%)	18.2	15.9	15.3	18.1	16.2	15.3
	Comp. ($000)	30.3	20.2	15.1	32.0	21.4	16.1
	No. of Profs.	284	72	185	290	68	183
Stanford	Salary ($000)	26.1	18.0	13.9	27.9	19.3	14.8
	Fringe (%)	17.8	18.0	19.8	17.1	21.9	20.1
	Comp. ($000)	30.7	21.2	16.7	32.7	23.5	17.8
	No. of Profs.	420	140	174	432	131	179
Columbia	Salary ($000)	25.9	18.1	13.8	27.5	19.2	14.6
	Fringe (%)	20.0	17.6	16.1	21.1	18.1	17.0
	Comp. ($000)	31.1	21.3	16.0	33.3	22.7	17.1
	No. of Profs.	459	121	211	458	115	226
Brown	Salary ($000)	23.4	16.9	13.4	24.4	17.4	13.8
	Fringe (%)	20.3	17.7	14.5	19.8	18.9	14.2
	Comp. ($000)	28.1	19.9	15.3	29.2	20.7	15.7
	No. of Profs.	236	79	116	246	80	99
Rochester	Salary ($000)	24.7	17.6	13.9	26.0	18.7	14.9
	Fringe (%)	16.6	17.6	17.8	17.5	18.3	18.5
	Comp. ($000)	28.8	20.7	16.4	30.6	22.1	17.6
	No. of Profs.	203	103	164	205	109	155
MIT	Salary ($000)	26.5	17.8	14.0	28.3	19.1	15.3
	Fringe (%)	17.9	18.5	20.1	19.6	19.3	21.1
	Comp. ($000)	31.2	21.1	16.8	33.8	22.8	18.5
	No. of Profs.	448	210	215	458	189	217
Michigan: Ann Arbor	Salary ($000)	25.6	18.6	15.1	27.1	19.4	15.8
	Fringe (%)	16.5	18.2	19.4	16.7	18.6	19.9
	Comp. ($000)	29.8	22.0	18.0	31.6	23.0	18.9
	No. of Profs.	859	379	390	891	383	376
Wisconsin: Madison	Salary ($000)	22.8	16.5	14.1	24.2	17.5	15.1
	Fringe (%)	17.8	19.7	20.8	18.1	20.3	21.4
	Comp. ($000)	26.9	19.8	17.0	28.6	21.0	18.3
	No. of Profs.	702	286	303	748	261	330
California: Entire System	Salary ($000)	25.5	17.6	14.6	27.3	18.8	15.8
	Fringe (%)	15.9	16.5	17.0	17.0	17.7	18.1
	Comp. ($000)	29.5	20.5	17.1	31.9	22.1	18.6
	No. of Profs.	2476	1246	1208	2570	1273	1181
Consumer Price Index			147.7			161.2	

Appendix Table A-4
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		1976/77			1977/78		
		PROFESSOR	ASSOCIATE	ASSISTANT	PROFESSOR	ASSOCIATE	ASSISTANT
Yale	Salary ($000)	31.0	19.3	14.6	32.3	20.5	15.4
	Fringe (%)	14.8	13.5	11.0	14.9	13.7	11.7
	Comp. ($000)	35.6	21.9	16.2	37.1	23.3	17.2
	No. of Profs.	356	142	245	355	122	250
Harvard	Salary ($000)	31.6	19.9	15.5	33.7	20.9	16.7
	Fringe (%)	21.8	15.6	16.1	21.4	13.9	14.4
	Comp. ($000)	38.5	23.0	18.0	40.9	23.8	19.1
	No. of Profs.	511	90	210	512	94	219
Chicago	Salary ($000)	30.2	20.7	16.6	31.5	21.6	17.5
	Fringe (%)	16.2	17.8	18.7	18.1	18.1	18.3
	Comp. ($000)	35.1	24.4	19.7	37.2	25.5	20.7
	No. of Profs.	384	164	176	391	156	167
Princeton	Salary ($000)	28.6	19.2	14.6	30.3	20.4	15.3
	Fringe (%)	18.9	17.2	13.7	21.8	18.6	15.7
	Comp. ($000)	34.0	22.5	16.6	36.9	24.2	17.7
	No. of Profs.	291	64	195	284	65	195
Stanford	Salary ($000)	30.1	20.7	16.5	32.2	21.9	17.5
	Fringe (%)	17.3	18.8	20.0	18.6	19.2	20.5
	Comp. ($000)	35.3	24.6	19.8	38.2	26.1	21.1
	No. of Profs.	435	133	177	450	130	163
Columbia	Salary ($000)	29.2	20.8	15.7	30.6	21.9	16.3
	Fringe (%)	21.9	15.4	15.3	22.5	17.4	14.7
	Comp. ($000)	35.6	24.0	18.1	37.5	25.7	18.7
	No. of Profs.	453	109	228	452	102	236
Brown	Salary ($000)	25.6	18.2	14.7	27.0	19.2	15.4
	Fringe (%)	14.8	16.5	14.3	19.6	18.2	14.9
	Comp. ($000)	29.4	21.2	16.8	32.3	22.7	17.7
	No. of Profs.	256	83	92	260	90	83
Rochester	Salary ($000)	29.9	21.6	17.2	28.9	20.8	16.3
	Fringe (%)	17.4	17.6	18.0	18.3	19.2	20.2
	Comp. ($000)	35.1	25.4	20.3	34.2	24.8	19.6
	No. of Profs.	200	127	179	203	118	177
MIT	Salary ($000)	29.4	19.9	16.0	31.3	21.1	16.9
	Fringe (%)	20.4	20.6	21.9	19.8	20.5	21.9
	Comp. ($000)	35.4	24.0	19.5	37.5	25.4	20.6
	No. of Profs.	449	191	192	459	197	178
Michigan: Ann Arbor	Salary ($000)	28.0	20.1	16.3	29.7	21.3	17.0
	Fringe (%)	17.9	20.4	21.5	17.8	20.2	22.4
	Comp. ($000)	33.0	24.2	19.8	35.0	25.6	20.8
	No. of Profs.	892	371	338	929	392	340
Wisconsin: Madison	Salary ($000)	25.3	18.1	15.9	26.7	19.2	16.6
	Fringe (%)	18.6	21.5	22.0	19.4	21.9	22.9
	Comp. ($000)	30.0	22.0	19.4	31.9	23.4	20.4
	No. of Profs.	800	279	277	784	259	294
California: Entire System	Salary ($000)	27.9	19.5	16.1	29.5	20.6	17.1
	Fringe (%)	17.9	18.0	18.0	20.0	21.4	21.1
	Comp. ($000)	32.9	23.0	19.0	35.4	25.0	20.7
	No. of Profs.	2672	1294	1385	2589	1257	1186
Consumer Price Index			170.5			181.5	

Appendix Table A-5

Multiple Regression on the Logarithms of Academic-Year Salaries within Rank, with Sex Differences, January 1978

(absolute value of t ratio is reported beneath regression coefficients in parentheses)

Explanatory Variables	Assistant Professors	Associate Professors	Full Professors
Job Experience:			
Number of years since received degree	.0469 (9.03)	.0212 (4.13)	.0308 (7.07)
(Number of years since received degree)^2 ÷ 100	-.272 (6.55)	-.0495 (3.80)	-.0448 (5.30)
Division:			
Natural Sciences	0	0	0
Foreign Languages	-.368	.0167	.0189
Humanities and English	-.0395 (3,228)	.0063 (3,74)	.0343 (3,273)
Social Sciences	-.0119	.0478	.0514
	4.94	1.78	2.36
Sex (female=1)	-.0034 (.74)	.0147 (.72)	-.0122 (.23)
Intercept	9.50 (563.)	9.70 (233.)	9.89 (185.)
R^2	.3977	.2301	.3045
Sample Size	235	81	280
Standard Error of Estimate	.0650	.0717	.129