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Faculty Pension Choices in a Public Institution: Defined Benefit and Defined Contribution Plans

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This article examines the pension choices made at a large public university where faculty can choose between defined benefit and defined contribution retirement plans. It was prepared especially for Research Dialogues by Professor Robert L. Clark, College of Management; Loretta Harper, Associate Vice Chancellor for Human Resources; and M. Melinda Pitts, Ph.D. candidate, Department of Economics, all of North Carolina State University.

Introduction

Benefits from employer-sponsored pensions are a significant source of income for many retirees. Along with Social Security and personal savings, pension income helps retirees maintain their previous standard of living. Social

Security alone does not provide enough. The need for additional retirement income is as important for academic personnel as for all other workers. Thus, it is important to understand the pension options available to faculty members and how pension decisions are made by newly hired faculty.

Faculty members employed at most colleges and universities in the United States are provided with pension coverage. For the most part, academic institutions can be divided into three groups with respect to the primary retirement plans offered employees: (1) private institutions that require newly hired faculty to enroll in a defined contribution pension plan¹; (2) public institutions that require faculty to enroll in a defined benefit pension plan sponsored by a state or local government; and (3) public institutions that give newly hired faculty a choice of enrolling in a public retirement plan or one of several defined contribution plans approved by the institution.² In addition to primary retirement plans in which faculty are required to participate, universities typically provide their faculty with the opportunity to participate voluntarily in supplemental salary reduction plans within Internal Revenue Code limits. This study examines only the enrollment decisions in primary pension plans.

The pension choices facing academicians are governed by the pension options offered by their employer. For many faculty, the choice between participation in a defined benefit plan or a defined contri-

bution plan is a factor in considering a job offer. Those accepting employment at a private institution are usually required to participate in a defined contribution plan, often funded from a list of one or more approved funding vehicles, while faculty at some public universities are required to enroll in the state defined benefit plan.

Other faculty at public institutions face a different pension choice. After they are hired, new faculty must decide whether to enroll in a defined benefit plan or to select one of several approved defined contribution plans also offered by their institutions, described as optional retirement plans, or ORPs. For these faculty members, the choice is very important, since their decision may substantially affect the size of their retirement benefits. When making the choice, newly hired faculty members must determine the expected value of participating in the defined benefit plan and compare it with the expected value of participating in the defined contribution plan. The most favorable option will depend on the person's age at employment, the probability of remaining with the current employer until retirement, expected retirement age, risk preferences, and certain other factors that differentially affect the value of defined benefit pensions relative to defined contribution pensions.

This report examines the choice of a pension plan at North Carolina State University (NC State), where newly hired faculty can choose between a defined benefit plan and one of three de-

defined contribution plans. The analysis, based on university administrative records and a 1995 faculty survey, provides new insights into how individuals value the two types of pensions and how they decide which plan to choose. The results can be directly useful to academic administrators at institutions that provide for pension plan choices and should also assist administrators at other institutions to understand the pension preferences of faculty.

Choosing a Plan: Expected Values

Pension plans are of two basic types: defined benefit and defined contribution.³ If given a choice, which type of pension plan will a newly hired faculty member select and why? To examine these questions, we first describe each type of pension plan and discuss what factors determine the expected value of enrolling in the plan. Next, we examine how the expected value of these plans varies across faculty with different characteristics. Our analysis indicates why some faculty are likely to prefer a defined benefit plan while others will prefer a defined contribution plan.⁴

Defined Benefit Plans Defined benefit plans promise participants a benefit in retirement based on a specific formula. A typical benefit formula would be: $(1.5\%) \times (\text{years of service}) \times (\text{average salary during the last five years of employment})$. Under such a plan, a worker with forty years of service would receive a retirement benefit equal to 60 percent of final average earnings. The employer is responsible for contributing sufficient resources into a pension fund to pay the promised benefit. In the private sector, government regulations specify minimum funding rates and prudent investment policies in an attempt to ensure that the plan sponsor will be able to pay its promised benefits. In addition, private companies must pay premiums to the Pension Benefit Guaranty Corporation to buy insurance for their defined benefit pension promises. Pensions of public employers are not subject to these regulations.⁵

In determining the expected value of enrolling in a defined benefit plan, employees must consider several uncertain-

ties about future employment and earnings, including: (1) the probability that they will remain with their current institution until retirement, (2) the rate of growth of real earnings, and (3) the effect of inflation before and after retirement. Since it's the employer's responsibility to fund the pension, the faculty member should not have to worry about investment risks and fluctuations in the value of the pension portfolio.⁶

The value of participation in a defined benefit plan depends greatly on the likelihood of the participant's remaining with the university until retirement. Since most benefits are based on final earnings, faculty who remain with a single university until retirement can accumulate benefits that represent a significant proportion of final earnings. On the other hand, individuals hired at relatively young ages who then leave after only a few years of service will accrue only a relatively small benefit based on earnings many years before actual retirement. Thus, faculty who enroll in defined benefit plans and who change employers several times throughout their academic career can expect to accumulate considerably lower retirement benefits than their colleagues who remain with a single university and participate in the same defined benefit plan throughout their career.⁷ As a result, faculty with more job security and a lower probability of changing employers before retirement will be more likely to select a defined benefit plan. And those hired with academic tenure or hired at older ages might also be more likely to enroll in defined benefit pension plans at the time of employment.

The effect of inflation on the real value of pension benefits is an important concern to many retirees. The issue is whether the expected initial retirement benefit grows in proportion to inflation. In most defined benefit plans, initial retirement benefits are determined by final earnings. Thus, the question becomes whether earnings increase in proportion to prices throughout an individual's career. After retirement, the real value of retirement benefits will decline with inflation unless pension benefits are periodically increased.⁸ A number of defined benefit plans in the public sector, including those

covering academic personnel, provide for automatic increases in retirement benefits to reflect annual price increases; however, these inflation adjustments are often subject to a maximum annual increase such as 3 percent per year (Johnson, 1987). These adjustments provide only some limited protection against the erosion of the real value of pension benefits after retirement.

The value of enrolling in defined benefit plans increases with age, since benefits are determined by final average earnings and not earnings over the entire working career (Kotlikoff and Wise, 1989).⁹ As noted, persons hired at older ages are therefore more likely to prefer participation in a defined benefit plan instead of a defined contribution plan. Tenure, increased job security, and the faculty member's greater likelihood of remaining with the same institution until retirement also are correlated with age and with the increased likelihood that faculty hired at older ages will enroll in a defined benefit plan when given the choice.

Defined Contribution Plans In defined contribution plans, the employer promises to contribute a specific percentage of salary, usually monthly, into an account for the employee. Employees may be permitted to determine how the money is invested from among approved funding vehicles, and the retirement benefit depends on the size of the employee's account at retirement. Faculty considering enrollment in a defined contribution plan must determine the expected value of its retirement benefits and compare it with the expected value of participation in the defined benefit plan.

In general, participants in defined contribution plans are not subject to the same kind of mobility risk facing participants in defined benefit plans. If a faculty member with a vested defined contribution account switches academic institutions, the account balance is unaffected, and if the move is to another institution that also offers this type of pension, the individual typically can continue to use the same pension account at the new institution. Faculty who have moved across several institutions will have the same retirement benefits as those who remained at one institution.¹⁰ As a result, faculty expecting

to change employers will be more likely to enroll in a defined contribution plan when it is offered by the institution. Younger faculty and those hired without tenure will be more likely to prefer a defined contribution plan. For those uncertain about their continued employment at a specific institution, the mobility risk is likely to be a dominant factor in their choice of a pension plan.

The retirement benefit for participants in defined contribution plans is determined by the size of their accounts at retirement, reflecting both the contributions made throughout a career and the rate of return. Under defined contribution plans, participants bear the financial risk associated with long-term retirement investing. And since participants are responsible for the investment choices they make in allocating their contributions, their choices are very important. Fluctuations in the value of the investment portfolio will directly affect the annuity benefits they receive.

Faculty who are more comfortable with this type of investment risk will enroll in a defined contribution plan, while others who would prefer to let the employer bear the financial risk will enroll in a defined benefit plan. Most defined contribution plans offered by institutions provide a series of options that allow participants to select alternative investment funds with different levels of risk.¹¹ They recognize that risk preferences among faculty may span a wide range and vary according to numerous factors, including level of income and academic discipline.

Determining Pension Preferences Analysis of the differences between defined benefit and defined contribution plans yields several predictions concerning faculty preferences for the plans: Younger hires and more mobile faculty may be more likely to prefer defined contribution plans, while older hires and tenured faculty may be more likely to select defined benefit plans. Factors that can influence how they assess the relative value of the two pension plans include their expectation of remaining at the institution until retirement; their academic discipline, which can reflect differences in the labor market for different

academic fields; and their professional reputation, which may be reflected in faculty rank and salary. The willingness of faculty members to accept investment risks will also affect their pension preferences. Those who are more comfortable accepting investment risks will be more likely to enroll in defined contribution plans. Higher-income earners may also be more willing to accept this type of risk. The following examination of pension choices at North Carolina State University is based on concepts concerning the relative value of the two types of pensions and how they vary across faculty.

Pension Choices at North Carolina State University

Before 1971, all faculty hired by NC State were required to enroll in the Teachers' and State Employees' Retirement System of North Carolina (the state retirement plan). Beginning in 1971, newly employed faculty members were given the option of enrolling in the state plan or in a plan funded through TIAA-CREF. When TIAA-CREF was introduced as a funding vehicle for the optional retirement plan (ORP), those hired between 1966 and 1971 were given the choice of remaining in the state plan or switching to the TIAA-CREF option. In 1992, Lincoln National Life and the Variable Annuity Life Insurance Company (VALIC) were introduced as additional options. Details concerning the choice of enrollment among these pension plans are provided below.

Most employees of the State of North Carolina who have permanent positions and who work at least thirty hours per week for nine months per year are required to enroll in the state retirement plan on their date of hire. However, the statutes of the State of North Carolina allow individuals who hold faculty rank (instructor or above) at any one of the state universities to participate in an optional retirement plan. Within thirty days after being hired or thirty days after achieving the rank of instructor or above, a new faculty member must decide whether to enroll in the state retirement plan or in one of the optional retirement plans. Employees who take no action are auto-

matically enrolled in the state plan. The decision to participate in either the state plan or one of the optional retirement plans is irrevocable. However, individuals who select one of the optional retirement plans can move from one of these plans to another. For example, a person who originally selects TIAA-CREF can shift his or her participation to the plan funded through VALIC, and vice versa.

At NC State, the benefits office is responsible for notifying employees of their eligibility and for providing information about the various plans. The distribution of materials and a discussion of the plans occur during new-employee orientation or in one-on-one sessions between the individual and a benefits counselor.

Vesting in the state retirement plan occurs after five years of covered service. When an employee leaves the system prior to vesting, the options are: (1) to withdraw the employee contributions (without interest), or (2) to leave contributions in the system, maintaining service credit for the period of covered service. An employee who leaves the system after vesting but without retiring has the option of withdrawing contributions or leaving the contributions intact and remaining as a member of the state plan. By remaining a member, the individual will be eligible for a retirement benefit at a later date.

Vesting in an ORP occurs immediately for employee contributions and at five years for employer contributions. However, if an NC State participant in an ORP leaves to accept employment in any other university with a defined contribution plan, the employer contributions remain in that person's account regardless of years of service at the first university.

The employee contribution for both plans is 6 percent of salary. This contribution is made as a pretax salary reduction.

The employer's contributions as a percent of salary to the state plan are:

8.15%	Pension fund
0.16%	Death benefit fund
2.00%	Retiree health fund
0.52%	Disability plan fund

The employer's contributions as a percent of salary to an ORP are:

- 6.66% Employee's account
- 2.00% Retiree health fund
- 0.52% Disability plan fund

Participants in both plans are eligible for the Disability Income Plan of North Carolina. This plan is funded by the employer as indicated above. The provisions of the disability plan are the same for those participating in the state retirement plan and any of the ORPs. After one year of contributory membership, there is a short-term disability provision that pays 50 percent of the employee's salary for a period of 365 days. There is also a long-term disability plan that pays 65 percent of salary after five years of contributory membership from the point of disability until the employee is eligible for retirement. Participants in the state plan also have a death benefit if death occurs while they are actively employed. This benefit equals the person's salary, with a minimum payment of \$25,000 and a maximum payment of \$50,000. For participants in the defined

contribution ORPs, the account balance serves as a death benefit for a spouse or other named beneficiary.

A participant in the state plan can retire with an unreduced benefit if one of the following criteria is met: (1) age 65 with five years of covered service; (2) age 60 with twenty-five years of covered service; or (3) thirty years of covered service at any age. A participant is eligible for early retirement with a reduced benefit at: (1) age 50 with twenty years of covered service; or (2) age 60 with five years of covered service.

Benefits are calculated using the following formula:

$$(average\ of\ highest\ consecutive\ 4\ years\ of\ salary) \times (1.75\% \text{ retirement factor}) \times (years\ of\ creditable\ service) \times (any\ reduction\ factor\ for\ early\ retirement).$$

Participants in an ORP can retire and begin receiving a benefit calculated on total contributions (employee and employer) at any age after benefits vest. However, there are penalties imposed by the Internal Revenue Service if benefits are started before age 59 1/2, although

there are exceptions. The payout for these individuals is based on the accumulated fund values and applicable mortality rates. Any retiree receiving a pension check, whether from the state plan or an ORP, is eligible to participate in the state health insurance plan under the same terms as active faculty, provided that the retiree was hired before October 1995 or has twenty years of creditable service. Cost-of-living increases for retirees in the state retirement plan are determined by the North Carolina General Assembly and generally reflect the increases given to active employees. These increases are added to the base retirement benefit and represent a permanent increase in the annual pension benefit.

When a participant retires from the state retirement plan, there are several payout options. The employee and employer contributions can be received as a lump-sum payment. Exercising this option, however, results in forfeiting retiree health benefits. In addition to a single-life annuity option (which provides the highest annual annuity benefit), there are four annuity options that provide a monthly

ORP Payout Options

TIAA-CREF	Lincoln National	VALIC
Single-life annuity	Single-life annuity	Single-life annuity
Single-life annuity with 10-, 15-, or 20-year guarantee period	Single-life annuity with 10-, 15-, or 20-year guarantee period	Single-life annuity with 1-year to 20-year guarantee period
Joint and survivor annuity (full benefit to survivor, half benefit to second annuitant, or 2/3 benefit to survivor)	Joint and survivor annuity (full benefit to survivor, half benefit to survivor, or 2/3 benefit to survivor)	Joint and survivor annuity (full benefit to survivor, half benefit to survivor, or 2/3 benefit to survivor)
Joint and survivor annuity, as above, with 10-, 15-, or 20-year guarantee period	Joint and survivor annuity, as above, with 10-, 15-, or 20-year guarantee period	Joint and survivor annuity, as above, with 1-year to 20-year guarantee period
Fixed-period annuity	Fixed-period annuity	Fixed-period annuity
Systematic withdrawal	Automatic withdrawal	Systematic withdrawal
Minimum Distribution Option	Uses systematic withdrawal	Uses systematic withdrawal
Partial settlements available with multiple starting dates and multiple settlement options	Partial settlements available with multiple starting dates and multiple settlement options	Flexible annuity payment
Unit refund life annuity not available	Unit refund life annuity	Unit refund life annuity
TIAA Interest Payment Retirement Option (IPRO)	Uses approximate systematic withdrawal	Uses approximate systematic withdrawal
Retirement Transition Benefit (1% to 10% of the amount annuitized)	No exact equivalent (however, lump-sum payments are available)	No exact equivalent (however, lump-sum payments are available)
TIAA Transfer Payout Annuity	No exact equivalent (however, a 10-year fixed period accomplishes approximately the same goal)	No exact equivalent (however, a 10-year fixed period accomplishes approximately the same goal)

Table 1
Percentage of North Carolina State University Faculty
in Current Retirement Plans
By Year Hired, 1965 - 1994

Year Hired (Beginning June 30)	Number	State Plan	TIAA-CREF	Lincoln National	VALIC
Through 1965	240	100.00%	0.00%	0.00%	0.00%
1966	37	100.00	0.00	0.00	0.00
1967	44	81.82	18.18	0.00	0.00
1968	39	79.49	20.51	0.00	0.00
1969	44	77.27	20.45	2.27	0.00
1970	30	63.33	33.33	0.00	3.33
1971	35	74.29	25.71	0.00	0.00
1972	25	36.00	64.00	0.00	0.00
1973	24	29.17	66.67	4.17	0.00
1974	34	41.18	58.82	0.00	0.00
1975	39	48.72	51.28	0.00	0.00
1976	62	41.94	58.06	0.00	0.00
1977	55	41.82	56.36	1.82	0.00
1978	48	58.33	39.58	2.08	0.00
1979	55	43.64	50.91	5.45	0.00
1980	52	40.38	57.69	1.92	0.00
1981	57	45.61	54.39	0.00	0.00
1982	74	25.68	72.97	0.00	1.35
1983	64	37.50	60.94	1.56	0.00
1984	55	16.36	81.82	1.82	0.00
1985	65	27.69	66.15	6.15	0.00
1986	79	21.52	72.15	5.06	1.27
1987	82	18.29	80.49	1.22	0.00
1988	78	25.64	73.08	1.28	0.00
1989	78	10.26	87.18	2.56	0.00
1990	74	17.57	78.38	4.05	0.00
1991	58	20.69	74.14	0.00	5.17
1992	77	15.58	71.43	7.79	5.19
1993	66	21.21	72.73	3.03	3.03
1994	43	11.63	76.74	9.30	2.33

annuity to a designated survivor. Under a "Social Security Leveling" option for individuals retiring before age 62, a retiree receives larger monthly payments than would otherwise be received until age 62-eligibility for Social Security benefits. Beginning at age 62, the monthly payments from the state retirement plan are thereafter less than would otherwise be received.

The payout options for an ORP vary by name among the three funding companies, although some of the options are essentially similar. The available options are shown by company in the chart on page 4.

The selection of a payout option by a participant in the state retirement plan is aided by a benefits counselor in the university business office. A participant in an ORP can select an option with the assistance of a counselor from the carrier.

Pension Enrollment

Participation in the various retirement plans available to faculty at NC State varies by faculty members' personal and professional characteristics. We examined the university's administrative records to determine how enrollment rates differ among the faculty. Data from the admin-

istrative records, which contain specific personal and employment characteristics of the faculty, were made available to the authors by the Division of Human Resources.

NC State computerized its administrative records in 1989. Previously, all records were kept in hard copy only, and past records were not included when the computerized files were developed. As a result, the files available for analysis include only persons who were employed by NC State between July 1989 and July 1994, when our analysis of the data began. Complete data are available for those who were employed before 1989 only if they remained at NC State at least until July 1989. Unfortunately, no information is available for those individuals hired in earlier years who left NC State before July 1989. For faculty who left NC State after July 1989, the date of termination is reported. There are 1,801 individuals represented in the administrative files who were employed by NC State for some time between 1989 and 1994.

Table 1 reports the number of faculty hired each year between 1966 and 1994 (conditional on their remaining employed at least until 1989) by their current pension plan status. The administrative records show that within one year after the ORP's introduction in 1971, a majority of new hires enrolled in the plan funded through TIAA-CREF. In most years before 1982, the proportion of new hires entering the state plan exceeded 40 percent, but after 1982, the enrollment rate in the state plan exceeded 30 percent only in one year. During the period 1989-1994 (when we have records for all new employees), the proportion of new hires choosing to enroll in the state plan has ranged between 10 and 21 percent.

The administrative records indicate a strong preference by persons hired at NC State for participation in a defined contribution plan over enrollment in the state's defined benefit plan. The relatively high defined contribution enrollment rates immediately after the introduction of funding through TIAA-CREF as an optional plan and the 80 to 90 percent enrollment rates in the optional retirement plans for

more recent hires indicate that most faculty prefer a defined contribution plan.¹²

Of the 1,801 individuals represented in the administrative files, 424 were hired before 1971 and were required to enroll in the state retirement plan when they were initially employed. Thus, a sample of 1,379 persons who were hired after 1971 and had the choice of enrolling in the state retirement plan or selecting an optional retirement plan at the time of their initial employment is available for analysis. In 1994, among the faculty who had a choice of a pension plan at the time of employment, 409, or 30 percent, were enrolled in the state retirement plan and 970, or 70 percent, were enrolled in one of the ORPs. Of more recent new hires, a larger proportion are enrolled in an ORP and a lower proportion are in the state retirement plan.

The average age at employment for faculty members at NC State was 36, with the average hire age for faculty in the state plan being slightly younger than that of individuals enrolled in TIAA-CREF. Faculty in the state plan have, on average, three more years of service than those participating in TIAA-CREF and over six more years of service than those participating in Lincoln or VALIC. Faculty participating in TIAA-CREF, Lincoln, and VALIC, have, on average, higher salaries than those participating in the state plan, while those in the state plan contribute at higher rates to supplemental retirement plans.

The distribution of faculty by various personal and professional characteristics, and by type of plan selected, is reported in Table 2. A higher proportion of African Americans (38 percent) chose to enroll in the state plan compared with that of whites (29 percent). The enrollment rate in the state plan among females (34 percent) is greater than that for males (28 percent). Assistant professors have chosen to fund through TIAA-CREF at higher rates (79 percent) than associate professors (70 percent) and full professors (65 percent). Instructors and lecturers have much higher enrollment rates in the state plan than those in tenure-track positions. Of those who had left NC State between 1989 and 1994, 80 percent had chosen one of the

Table 2
North Carolina State University Faculty
Sample Means and Distributions of Variables
By Type of Plan Selected, 1994

Variable	Sample Means (standard deviation)	State Plan	TIAA-CREF	Other ORP
Pension Plan		29.67%	66.86%	3.47%
Personal Characteristics				
White	0.8702 (0.3362)	29.25	67.25	3.50
African American	0.0645 (0.2458)	38.20	58.43	3.37
Other nonwhite	0.0653 (0.2471)	26.67	70.00	3.33
Male	0.7723 (0.4195)	28.26	68.26	3.47
Female	0.2277 (0.4195)	34.39	62.10	3.50
Rank				
Professor	0.3756 (0.4845)	31.85	65.44	2.70
Associate Professor	0.3220 (0.4674)	27.48	69.59	2.93
Assistant Professor	0.1951 (0.3964)	15.24	79.10	5.58
Instructor/Lecturer	0.1073 (0.3096)	54.73	41.22	4.05
Contract				
12-month contract	0.4948 (0.5002)	35.61	60.32	4.07
9-month contract	0.5011 (0.5002)	23.73	73.37	2.89
College				
Agriculture and Life Sciences	0.2444 (0.4299)	40.65	56.68	2.67
Design	0.0305 (0.1719)	21.43	73.10	4.76
Education	0.0660 (0.2484)	27.47	68.13	4.40
Engineering	0.1458 (0.3530)	20.90	76.62	2.49
Forest Resources	0.0392 (0.1940)	46.30	50.00	3.70
Humanities and Social Sciences	0.1987 (0.3992)	31.75	66.06	2.19
Physical and Mathematical Sciences	0.1073 (0.3096)	14.86	79.73	5.41
Textiles	0.0261 (0.1595)	55.56	38.89	5.56
Veterinary Medicine	0.0790 (0.2699)	15.60	77.98	6.42
Management	0.0486 (0.2151)	20.90	74.63	4.48
University Administration	0.0116 (0.1071)	55.00	45.00	0.00
Left NC State	0.0508 (0.2196)	20.00	77.14	2.86
Number	1,379	409	922	48

ORPs. More than half of the faculty in all colleges, except for the College of Textiles

and University Administration, chose to participate in one of the ORPs. ORP en-

rollment rates exceeded 75 percent among faculty hired in the Colleges of Design, Engineering, Physical and Mathematical Sciences, Veterinary Medicine, and Management.

How Faculty Decide

During the 1995 spring semester, we developed a survey that was sent to all current NC State faculty as part of a research project funded by TIAA-CREF. The survey was sent through campus mail by the NC State Division of Human Resources. Questionnaires were sent to 1,652 faculty members, and 675 completed surveys were returned. The faculty were asked to provide information concerning the pension plans in which they were enrolled, whether they had ever changed retirement plans, their date of birth, current salary, rank at the time of employment, type of employment, college of appointment, marital status, and gender. After eliminating survey responses from individuals hired before 1971, who were required to enroll in the state retirement plan when they were employed, there were 580 remaining surveys. Among these respondents, 187 were enrolled in the state retirement plan, 370 were in the plan funded through TIAA-CREF, 14 were in Lincoln National, and 9 were in VALIC. The mean values for various personal and academic characteristics of the faculty are shown in Table 3, column 1. These values are based on the responses of 571 faculty who provided information on all of the listed characteristics.

The Decision Process One of the objectives of the survey was to collect information on the decision-making process used by NC State faculty to determine their preferred type of pension. Respondents were asked to indicate how they gathered and processed information to select a pension. In general, the evidence suggests that the pension enrollment decision was made rather casually, with limited information, and without much consultation with retirement planners. In evaluating these responses, it is important to recognize that individuals were asked to recall how they made their pension choice when initially employed at NC State. For many

faculty, this decision was made a number of years ago.

The survey asked how much time and consideration individuals gave to selecting their pension plan. Approximately 29 percent of the faculty responded that they “did not give much consideration to the choice of my primary retirement plan,” while 48 percent “devoted a moderate amount of thought” to selecting their pension, and only 22 percent indicated that they “devoted a great deal of thought” to this process. Approximately 60 percent of respondents recalled that they “received and read information” from the state retirement plan and the optional retirement plans before making their pension decision. Among those reporting that they had read this information, 20 percent thought it was very helpful, about half found the information moderately helpful, and 28 percent found it only somewhat helpful or not helpful.

In assessing their contact with the university benefits office, 31 percent of faculty respondents did not remember having any contact with representatives from the university’s benefits office. Among those reporting that they had met with representatives from the benefits office, 27 percent found these benefit representatives to be very helpful; 29 percent, moderately helpful; 27 percent, somewhat helpful; and 17 percent, not helpful. Respondents were asked to identify people with whom they discussed their options before making the enrollment decision. Almost 30 percent of those faculty responding indicated that they “did not consult anyone concerning this decision.” The most frequently identified adviser was a spouse, with one-quarter of the respondents indicating that they had consulted with their spouse. Fewer than 5 percent of the respondents indicated they had consulted with representatives of the pension providers, an independent financial planner, or a financial adviser such as an accountant, stockbroker, or insurance agent.

The limited time and effort devoted to choosing a pension plan are probably related to the perceived easiness of the decision. Over 30 percent of the respondents thought that the choice of a pension plan was “easier than most” financial decisions,

while over half believed it to be “about the same level of difficulty.” But despite their perceived lack of difficulty in deciding on a pension plan, employees can make irreversible errors by not obtaining key pieces of information. A significant element of the pension decision at NC State is that faculty who enroll in the state retirement plan must remain in that plan throughout their employment at NC State; those who enroll in one of the ORPs can never switch into the state plan. Only 56.5 percent of the respondents indicated that they were aware of this restriction when they chose their pension plan. Employees who enrolled in an ORP were more aware of the restriction than those who enrolled in the state retirement plan. Only 40 percent of the participants in the state retirement plan reported that they knew that they would not be allowed to switch to one of the ORPs in the future, compared with the two-thirds of those in one of the ORPs who were aware of this restriction.

Another objective of our survey was to obtain information about faculty members’ knowledge concerning key investment aspects of defined contribution plans. Information requested included factors affecting the performance of their investments, their satisfaction with their pension fund performance, investment objectives related to levels of risk preferences, and the types of investment options chosen. This information was collected only for ORP participants.

The majority of these individuals felt that they were somewhat to moderately knowledgeable about the factors that affect the risk and return of various types of investments. Only 16 percent of respondents considered themselves very knowledgeable, while just 13 percent considered themselves not knowledgeable at all. Over 64 percent of them were satisfied with the performance of their investments, with about 19 percent very satisfied and only 7 percent dissatisfied or very dissatisfied. Moderate returns with moderate risks best describes the investment objectives of most faculty members. Fewer than 5 percent preferred low-risk investments with low returns, and 21 percent preferred high-risk investments with high rates of return. The relationship be-

Table 3
Choice of State Plan by Indicated Variable
North Carolina State University Faculty
(1995 Faculty Survey)

Variable	Means (standard dev.)	Probit Coefficients (standard error)	Probit Effects	Variable	Means (standard dev.)	Probit Coefficients (standard error)	Probit Effects
Current Retirement Plan				College of Appointment (continued)			
State plan	0.3240 (0.4684)			Education	0.0560 (0.2302)	-0.1434 (0.3212)	-0.0441
TIAA-CREF	0.6077 (0.4887)			Engineering	0.1278 (0.3342)	-0.3823 (0.2497)	-0.1069
Lincoln National	0.0210 (0.1436)			Forest Resources	0.0438 (0.2048)	-0.2464 (0.2991)	-0.0728
VALIC	0.0175 (0.1313)			Humanities and Social Sciences	0.1366 (0.3437)	-0.4784* (0.2486)	-0.1283
Personal Characteristics				Physical and Mathematical Sciences	0.0981 (0.2977)	-0.4389* (0.2529)	-0.1197
Hire age	36.1944 (7.9560)	0.0208* (0.0113)	0.0070	Textiles	0.0385 (0.1926)	0.7157* (0.3262)	0.2684
Years of service	10.5464 (6.7118)	0.0663** (0.0122)	0.0225	Veterinary Medicine	0.0823 (0.2751)	-0.3473 (0.2550)	-0.0985
Female	0.2347 (0.4242)	0.0876 (0.1708)	0.0291	Management	0.0490 (0.2161)	-0.4766 (0.3633)	-0.1279
Participation in a supplemental retirement plan	0.9562 (0.2048)	-0.0854 (0.3400)	-0.0268	Prior Pension Plan			
Annual Salary				State	0.0298 (0.1701)	1.8314** (0.5080)	0.6235
\$0 - \$49,999	0.2697 (0.4442)			Optional	0.2067 (0.4053)	-0.4960* (0.2030)	-0.1319
\$50,000 - \$74,999	0.4431 (0.4972)	-0.3300* (0.1852)	-0.0943	Other	0.2925 (0.4553)	0.3025* (0.1616)	0.1063
\$75,000 - \$99,999	0.1821 (0.3863)	-0.4366* (0.2503)	-0.1192	Work and Retirement Plans			
\$100,000 and over	0.0788 (0.2697)	-0.6129* (0.3506)	-0.1545	Retire from NC State	0.6725 (0.4697)	0.2770 (0.2016)	0.0967
Faculty Rank When Hired				Move to another academic institution in the UNC system	0.0123 (0.1101)	-0.9252 (0.9142)	-0.2002
Professor	0.0893 (0.2855)	0.0025 (0.3041)	0.0008	Move to another academic institution not in the UNC system	0.1349 (0.3419)		
Associate Professor	0.1296 (0.3362)	-0.1994 (0.2253)	-0.0600	Move to another type of job	0.1646 (0.3712)	-0.0623 (0.2399)	-0.0197
Assistant Professor	0.4396 (0.4968)			Marital Characteristics			
Instructor/Lecturer	0.1769 (0.3819)	0.3380* (0.2051)	0.1197	Married	0.8144 (0.3892)	0.1954 (0.2128)	0.0669
Administrative	0.0613 (0.2401)	-0.5144 (0.3528)	-0.1357	Spouse employed	0.5517 (0.4978)	-0.3198* (0.1906)	-0.0918
Other	0.0893 (0.2855)	0.5143* (0.2472)	0.1882	Spouse in pension plan	0.3923 (0.4887)	0.1549 (0.1718)	0.0524
Type of Appointment				Constant		-2.1001** (0.5822)	
12-month, tenure track	0.3450 (0.4758)			Number		571	
9-month, tenure track	0.3503 (0.4775)	0.4310* (0.1997)	0.1555				
Other	0.2907 (0.4545)	0.6727** (0.1936)	0.2512				
College of Appointment							
Administrative	0.0385 (0.1926)	-0.5195 (0.3752)	-0.1367				
Agriculture and Life Sciences	0.2644 (0.4414)						
Design	0.0158 (0.1247)	-0.5908 (0.5157)	-0.1505				

* significant at the 10% level
** significant at the 1% level

tween risk and rate of return was factored into the investment decision of approximately 4 percent of participants in the ORPs.

Determinants of Pension Enrollment To examine the personal and professional characteristics that influence the choice of a pension plan, a probit equation for par-

ticipation in the state retirement plan is estimated for NC State faculty hired after 1971 who responded to the faculty survey. Probit analysis is a nonlinear statisti-

cal technique that yields unbiased coefficients when the dependent variable takes on values of 1 and 0. The estimated probit coefficients, shown in Table 3, column 2, must be transformed to produce the marginal effects of the explanatory variables on the probability of enrolling in the state retirement plan. These effects represent the change in the probability of being in the state plan in response to a one-unit change in one of the continuous variables, such as years of service, or a change from 0 to 1 for the dichotomous variables, such as being an associate professor. All of the marginal effects are calculated as the change in the probability of participation in the state retirement plan given the change in the explanatory variable relative to the probability that a person with characteristics of the base case chose to enroll in the state plan. The base-case faculty member is a male who was hired as an assistant professor with a salary of less than \$50,000, with a twelve-month nonadministrative appointment in the College of Agriculture and Life Sciences, who expects to leave NC State before retirement and to move to another academic institution not in North Carolina.

The marginal effects of the explanatory variables are reported in Table 3, column 3. The probit results illustrate how the probability of enrolling in the state retirement plan differs across the personal and professional characteristics of NC State faculty. The primary findings from this analysis support the hypotheses stated earlier concerning preferences for participation in defined benefit and defined contribution pension plans.

Faculty hired at older ages are significantly more likely to enroll in the state retirement plan instead of enrolling in one of the ORPs. The probability of enrollment in the state plan increases by 7.0 percentage points for each 10-year increase in employment age. This finding is consistent with the conclusion that the value of participation in a defined benefit plan increases with advancing age relative to enrollment in a defined contribution plan. It also reflects a decline in the mobility risk associated with age because of the greater likelihood that older faculty

are hired with tenure and they have fewer years of work remaining until retirement.

Faculty who anticipate remaining at NC State until they retire are more likely to have chosen the state retirement plan. Individuals who expect to retire from NC State are 9.7 percentage points more likely to be enrolled in the state retirement plan than those who think that they will leave the university before retirement. Although this result is not statistically significant, it is consistent with the find-

in this plan due to previous employment.”

Higher current salary is associated with a lower probability of participating in the state retirement plan. Faculty with an annual salary of \$50,000 to \$74,999 are 9.4 percentage points less likely to participate in the state retirement plan than are faculty with earnings of less than \$50,000. Individuals with earnings in excess of \$75,000 are even less likely to participate in the state retirement plan.

Considerable evidence indicates that additional education, counseling, and information would help newly hired faculty make better decisions in the choice of their pension plan

ing that reduced mobility increases the relative value of participation in a defined benefit plan. The importance of the portability of retirement benefits in the choice of a pension plan is also shown directly in the survey where over one-third of the respondents indicated that “transferability of pension to other employers” was the characteristic of a pension plan that most influenced their choice of a retirement plan.

The survey indicated that newly hired faculty members at NC State often decide to enroll in the same pension plans that they had at previous jobs. Faculty who had participated in a plan funded through TIAA-CREF, Lincoln National, or VALIC at a previous job were 13.2 percentage points less likely to enroll in the state retirement plan when hired at NC State. Similarly, persons who had been participants in the state plan at other jobs or who were enrolled in some other type of pension were more likely to enroll in the state retirement plan at NC State. These findings illustrate the importance of prior service credits to the value of continued participation in a defined benefit plan and support the notion that individuals tend to remain in plans that they already know. In the survey, 17 percent of respondents gave as the most important reason for their choice of a pension plan at NC State that they were “already enrolled

This relationship between salary and pension participation is consistent with the hypothesis that faculty with higher earnings tend to be more comfortable with the investment risk associated with the ORPs. Higher salaries may also reflect the person’s academic reputation and indicate that these faculty have greater prospects of receiving (and accepting) other job offers. As a result, these higher-income faculty will place a greater value on the portability of retirement benefits in the ORPs.

Persons hired as instructors, lecturers, or in other nontenure-track positions are 12 percent to 19 percent more likely to enroll in the state retirement plan than assistant professors. There is no statistically significant difference in the pension choice among those hired as assistant, associate, or full professors. There are significant differences in the choice of a pension across the colleges and schools at NC State. In comparison with faculty hired in the College of Agriculture and Life Sciences, faculty in the Colleges of Humanities and Social Sciences and those employed in Physical and Mathematical Sciences are 12 to 13 percentage points less likely to enroll in the state retirement plan, while faculty employed in the College of Textiles are 26.8 percentage points more likely to decide to participate in the state plan. While the estimated ef-

fects of employment in the other colleges are not statistically significant, all of the estimated effects indicate that faculty employed in these colleges are less likely to have selected the state retirement plan than faculty hired in the College of Agriculture and Life Sciences. Based on the probit estimates, gender does not significantly affect the choice of a pension plan, nor does marital status or the pension plan status of one's spouse; however, having an employed spouse reduces the probability that a newly hired faculty member will enroll in the state retirement plan. Finally, there is a trend toward increasing preference for enrollment in one of the ORPs by newly hired faculty at NC State. Being hired one year earlier increased the probability of selecting the state plan by 2.25 percentage points. Thus, a person hired in 1975 is 45 percentage points more likely to have enrolled in the state retirement plan than an individual hired in 1995.

Conclusions

The choice of a pension plan can be one of the primary determinants of the financial well-being of retired faculty. While many newly hired faculty are required to participate in the sole primary pension plan of their university, others are employed by institutions that offer a choice between defined benefit public pension plans and defined contribution plans. Typically, the choice of which plan to accept must be made immediately after being employed. Currently, very little is known about how faculty make their selection of a pension and what factors determine the relative value of the two plan types. This study provides the first systematic evidence concerning the choice of pension plans among newly hired faculty. While the study is limited to a single university, it provides unique insights into the pension decision.

Our statistical analysis of the 1995 faculty survey at NC State indicates that newly hired faculty are more likely to choose enrollment in the state retirement plan the older they are at the time of employment, particularly if they expect that they will remain at NC State until retirement. In addition, faculty hired in non-

tenure-track positions are more likely to enroll in the state retirement plan, as are faculty with appointments in the College of Textiles. The labor market conditions facing individuals, depending on their academic discipline, type of appointment, and level of earnings, also influence their choice of a pension plan. Among faculty newly hired at NC State, there has been a significant trend over time in favor of enrollment in one of the ORPs.

These findings are consistent with predictions based on economic theory concerning the relative value of pension plans to individuals. But despite the finding that pension choices reflect the expected value of the two types of pensions, the survey indicates that faculty members actually based their pension decision on relatively little information or advice. They didn't view it as a difficult financial decision, and they devoted relatively limited time to making the decision.

This type of decision making can lead to important errors in the choice of a pension. Survey evidence indicates that some faculty now believe that they made the wrong pension choice. In response to the question, "How confident are you that you selected the most appropriate retirement plan for you?" 17 percent of the respondents answered that they were "not at all confident" in the pension decision. Most of those expressing doubts were enrolled in the state plan.¹³ Statistical analysis of these responses indicates that participants in the plan funded through TIAA-CREF were the most likely to express confidence that they had made the correct pension choice (Clark and Pitts, 1996).

The findings from the NC State faculty survey should help academic administrators better understand the pension preferences of newly hired faculty. These insights can help universities develop more appropriate benefit packages. In addition, the analysis can help administrators predict which options their faculty are likely to select, as well as understand why these decisions are made. Finally, considerable evidence indicates that additional education, counseling, and information would help newly hired

faculty make better decisions in the choice of their pension plan. □

Endnotes

- ¹ Most of these universities provide their faculty with a choice among several defined contribution plans. TIAA-CREF is typically one of the choices available to faculty members.
- ² Limited data indicated that a rather small number of public universities may limit the pension choice to a defined contribution plan, while a few private universities offer defined benefit plans.
- ³ Recent changes in the structure of some defined benefit pension plans in the private sector of the economy have created several types of hybrid or "cash balance" plans that tend to blur the distinction between the two principal plan types.
- ⁴ Clark and McDermed (1990) provide a more detailed examination of the choice between defined benefit and defined contribution plans. They also document the significant trend toward greater use of defined contribution plans throughout the economy.
- ⁵ A comprehensive description of the characteristics of various types of retirement plans and current government regulation of these plans is provided by McGill, Brown, Haley, and Schieber (1996).
- ⁶ Another type of risk faced by participants in defined benefit plans is that of default by the plan sponsor. In the private sector, this risk is somewhat limited by funding requirements and the mandatory purchase of pension insurance from the Pension Benefit Guaranty Corporation. Even with fully insured benefits, the early termination of the plan before retirement can result in the loss of expected pension benefits. Public pensions are not subject to these federal funding requirements. Participants depend on the promise to pay future retirement benefits made by the governmental units. The expected risk of default for most faculty employed at public educational institutions is quite low.
- ⁷ Job changes result in substantial reductions in lifetime pension benefits when the retirement benefit is based on final average earnings (Clark and McDermed, 1988). Allen, Clark, and McDermed (1993) show how this loss in pension benefits reduces employee turnover. Kotlikoff and Wise (1989) provide evidence on how the value of defined benefit pension coverage increases with age and tenure and examine how these changes alter job mobility.
- ⁸ Allen, Clark, and Sumner (1986) showed that ad hoc postretirement increases by plan sponsors in private firms were widespread during the 1970s and averaged about 40 percent of the rate of inflation. Allen, Clark, and McDermed (1992) found that the incidence and size of postretirement increases in benefits declined during the 1980s in the private sector.
- ⁹ An additional factor that increases the value of defined benefit pension coverage with age is the reduced number of years until retirement.

Holding final earnings constant, each year of service increases initial retirement benefits by the same dollar amount. This increases the value of future retirement benefits by the same amount regardless of the worker's age. The present value of this increase is larger for older workers as they are closer to retirement; hence the increase in retirement benefits is discounted by fewer years.

¹⁰This analysis assumes that the individual's lifetime earnings are unaffected by changing institutions and that all of the institutions have the same contribution rates. These assumptions allow us to identify the independent effect of pension coverage associated with changing jobs from the other changes that might occur when a faculty member moves to another university.

¹¹For example, the TIAA traditional annuity provides participants with guaranteed principal and specified interest, plus the opportunity for growth through dividends, while CREF and the TIAA Real Estate Account offer variable accounts that generally tend to have higher risk and the opportunity for higher returns.

¹²The apparent trend toward a higher proportion of new hires who enroll in the optional retirement plans may be the result of greater mobility, or greater expected mobility, among

the participants in these plans. If participants in the optional retirement plans are more likely to change universities, the result is that a higher percent of those remaining at NC State will be in the state plan compared with the enrollment rate among all persons hired in a given year. This bias would be larger the further back in time, creating the impression of a time trend toward greater enrollment in the optional retirement plans.

¹³Almost one-third of all participants in the state retirement plan indicated that they were not at all confident in their choice of a pension plan. In contrast, less than 10 percent of those in one of the ORPs indicated that they were not at all confident that they had made the correct pension choice.

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