

**THE IMPACT OF A NEW PHASED RETIREMENT OPTION ON  
FACULTY RETIREMENT DECISIONS**

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**Abstract**

Life-cycle theory suggests that workers would prefer to gradually enter retirement from their career jobs. Using data from the 15 campuses of the University of North Carolina system, this study provides a first look at the effects of the introduction of a phased retirement program on faculty retirement decisions. Our analysis indicates that most of the faculty members choosing phased retirement would have likely remained full-time at their universities had the phased retirement option not been available.

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## INTRODUCTION

Lifecycle theories of time allocation typically predict that workers would prefer to gradually reduce their hours of work as they approach the end of the working career.

Gerontologists, policy-makers, and other social scientists have often argued that a smoother transition into retirement would be more desirable than an abrupt shift from full-time work to full-time retirement or leisure. The reality for many workers is that they leave a career job on which they were working full-time and end all market work.

Why does the actual pattern of retirement deviate from the predicted or desired transition? Two potential explanations are often given to explain why theory and reality diverge. First, labor costs are often tied to the number of workers employed and not simply to the total number of hours of work provided by all employees. These fixed costs of employment include hiring and training costs associated with new employees, benefits costs tied to the worker such as health insurance, and costs of coordinating work teams. Thus, firms may have a preference for hiring fewer full-time workers rather than more part-time employees.

Second, the total compensation per hour of work is not constant for many workers implying that these workers would face substantially lower compensation for working part-time compared to full-time compensation. For older persons, this break in compensation per hour is the result of pension characteristics and other retirement policies. In defined benefit plans, pension accruals are often based on final average salary. Thus, switching from full-time to part-time employment at a reduction in total earnings could substantially reduce future pension benefits if these part-time years were included in the calculation of pension benefits. Currently, provisions under the Employee Retirement Income Security Act (ERISA) do not allow in-service distributions to participants – thus, employees cannot elect to retire, start a pension, and then

continue to work part time for the same company. Public sector employers are not subject to these ERISA provisions.

These two factors imply that workers seeking to reduce hours of work per week in the final stages of their work lives often must change employers if they wish to gradually retire. This tendency to move to new or bridge jobs has been documented by Quinn (1999) and Ruhm (1990). The emergence of bridge jobs as a method of transitioning to retirement indicates that some workers prefer gradual rather than complete retirement. However, bridge jobs typically pay substantially lower wages per hour compared to the career jobs of most individuals (Quinn, 1999). As a result, older persons still face the labor-leisure choice of full-time work at the full-time wage or part-time work at a much lower hourly wage.

Some employers are now beginning to adopt phased retirement programs that permit workers to retire from their full-time positions, be rehired by their career employers at fewer hours per week, but still receive their full-time hourly wages (Watson Wyatt Worldwide, 1999). A typical program might allow individuals to work half-time and receive half of their previous salaries or receive basically the same wage per hour for working half as many hours per time period. Two basic questions arise concerning the adoption of these new programs. Will workers recognize this new labor supply option and enter phased retirement programs? Are participants in phased retirement programs individuals who otherwise would have remained on the job full time or are they people who would have retired rather than continuing to work full time? Answers to these questions are important to understanding the retirement process and assessing the impact of phased retirement programs on employers. There is virtually no systematic evidence evaluating the impact of phased retirement plans.

In this paper, we examine the response of faculty members in the 15 campus University of North Carolina (UNC) system to the introduction of a phased retirement plan in the 1997-1998 academic year.<sup>1</sup> While university faculty are not necessarily representative of the labor force at large, our analysis provides an interesting first assessment of phased retirement programs. The next section provides a description of the phased retirement program at the UNC system and a discussion of the employment records used to estimate participation in the program. This is followed by a brief review of life-cycle labor supply theory that illustrates the impact of introducing a phased retirement plan. Finally, we present the results of the first statistical study of a phased retirement program.

### **PHASED RETIREMENT IN THE UNC SYSTEM**

In 1996, UNC President C.D. Spangler established a system-wide committee to study the need for early retirement programs. The committee concluded that since the university was expecting the student population to increase by 40,000 students in the coming decade, there was no need adopt early retirement programs with the objective of reducing the number of faculty. Instead, this committee recommended that the UNC system consider introducing a phased retirement plan that would allow older faculty with sufficient service to reduce their work loads while remaining with the university. Such a program might moderate the aging of the faculty without increasing total costs.<sup>2</sup>

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<sup>1</sup> The University of North Carolina is composed of 15 campuses including two research institutions (UNC-Chapel Hill and NC State University), two doctoral universities, eight universities granting masters degrees, and three baccalaureate universities. Employment records from these institutions are merged for this analysis.

<sup>2</sup> The UNC faculty aged rapidly between 1982 and 1999. During this period, the proportion of the faculty aged 55 and older increased from 18.2 percent to 31.2 percent and the mean age of the faculty rose from 44.5 years to 49.4 years (Clark and Ghent, 2000).

The objective of this program was to provide older faculty with a new employment option. The phased retirement program was designed to give faculty the choice of remaining on the job part time subject to some safeguards for the university. Faculty who enter the program prefer partial retirement with their current employer to full-time work, full-time retirement, or part-time work with another employer. The program enhances the university's ability to plan since the faculty entering the program relinquish tenure in exchange for a fixed-term contract. No special subsidies were made available to the participants in the program so in general, the program is cost neutral to the UNC system.

The Board of Governors adopted a five-year trial program beginning in 1998 that permitted half-time work for half-time pay. Each campus was required to implement a phased retirement program that allowed faculty to retire and give up tenure in exchange for a fixed-term contract for half-time work at half-time pay. To be eligible for the program, individuals had to be age 50 with 20 years of service or age 60 with 5 years of service at the same institution. Each campus was allowed to select the length of the contract for its faculty; however, the program required a minimum length of one year and a maximum length of five years. Twelve of the 15 institutions chose a three-year phased retirement contract, two chose a two-year contract, and one campus chose a five-year phased retirement contract.

Individuals who were considering entering the program negotiated their half-time duties with their department chairs prior to accepting phased retirement. Duties could be performed evenly across both semesters or the individual could work full-time one semester and have no specific assigned duties the next semester. Persons in phased retirement do not receive most

employee benefits; however, if they begin their retirement benefits, they are eligible for the same health insurance as active employees.<sup>3</sup>

Since 1971, all newly-hired faculty in the UNC system have been eligible to choose whether they want to be enrolled in the Teachers' and State Employees' Retirement System (the state pension plan) or in an optional retirement plan (ORP). Currently, faculty have the option of enrolling in one of three ORPs (TIAA-CREF, Lincoln National, and VALIC).<sup>4</sup> The state plan is a final pay, defined benefit plan while the optional retirement plans are all defined contribution plans.<sup>5</sup> Retirement incentives differ substantially in these plans. The state pension plan provides significant monetary incentives to retire for faculty who have satisfied the age and service requirements for early and normal retirement. In contrast, the defined contribution plans are more age neutral in their retirement incentives. The UNC employment data clearly indicate that age-specific retirement rates differ significantly between faculty covered by the state plan and those enrolled in one of the optional retirement plans.<sup>6</sup>

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<sup>3</sup> Interested readers can examine the details of the phased retirement program at NC State University by looking on the World Wide Web at [http://www.ncsu.edu/provost/offices/academic\\_personnel/policy/prp\\_guidelines.html](http://www.ncsu.edu/provost/offices/academic_personnel/policy/prp_guidelines.html).

<sup>4</sup> Clark and Pitts (1999) examine the choice of a pension plan for newly hired faculty at NC State University. They report a significant increase over time in the proportion of new faculty selecting one of the optional retirement programs. Among their other findings are that older persons are more likely to enroll in the state plan, while faculty who are more likely to leave prior to retirement have a higher probability of choosing one of the optional plans.

<sup>5</sup> The benefit formula for the state plan is 1.8 percent of final average earnings multiplied by years of service. Average earnings are based on the employee's four highest consecutive years of earnings. The plan has five-year vesting requirements. The normal retirement age is 65 with 5 years of creditable service; however, the plan also provides unreduced retirement benefits with 30 years of service regardless of age or at age 60 with 25 years of creditable service. Early retirement with reduced benefits is available at age 50 with 20 years of service or age 60 with 5 years of service. Faculty enrolled in one of the optional retirement plans are required to contribute 6 percent of salary and the state contributes 6.66 percent of salary to the individual's retirement account. Benefits at retirement in these plans depend on lifetime contributions and accrued rates of return.

<sup>6</sup> A study by Clark, Ghent, and Kreps (2000) estimates age specific retirement probabilities for faculty at Duke University, UNC-Chapel Hill, and NC State University. In their analysis, participants in the state retirement plan are found to have significantly higher retirement probabilities than comparable individuals in one of the optional retirement plans.

The data used in the analysis are based on the annual faculty censuses that each campus is required to submit to the General Administration of the UNC system. These are the employment records for all faculty employed as of September of the specified year. Information on each person includes age, hire date, rank, gender, race, tenure status, annual salary, and type of pension plan. The annual records are linked across years so we are able to determine whether an individual remains in his or her faculty position from one year to the next. The data for the years 1995 until 1999 are employed in this study. The analysis is limited to faculty who were eligible to enter the phased retirement program. This means that the sample includes only tenured faculty who were at least age 50 with 20 or more years of service or at least age 60 with 5 or more years of service.

In recent years, most newly hired faculty have chosen to enroll in one of the ORPs; however, a majority of faculty over the age of 50 were in the state plan in all of the years in this analysis. For example, two thirds of the 1995 sample were in the state plan. By 1998, the participation rate in the state plan among these older faculty had declined to only 54 percent. Throughout this period, no special early retirement plans were offered to encourage faculty to retire or to reduce the size of the UNC faculty. The phased retirement program is available to participants in both of the pension plans. The eligibility criteria for the phased retirement plan are similar to those required for early retirement benefits under the state pension plan. Thus, all participants in the state plan simultaneously become eligible for early retirement pension benefits and phased retirement.

## **LIFE-CYCLE LABOR SUPPLY AND PHASED RETIREMENT PROGRAMS**

In the life-cycle model of labor supply, workers smoothly and continuously adjust hours of work in response to current and expected values of market wages and exogenous income. Variations across individuals in the life-cycle path of work hours also result from differences in initial wealth. In this framework, older members of the labor force reduce their hours of work for two main reasons: declining wage rates (whether brought on by declining investment in human capital, lower productivity or labor market discrimination) or pure time effects (reflecting rates of time preference net of the interest rate). As long as the interest rate is greater than the rate of time preference, labor supply should decline over time, holding the wage rate constant (Killingsworth, 1983, p. 216). This lifecycle pattern of work reflects the incentive to work hard and save in one's early years in the labor market so that the fruits of such labors can be consumed in the later years.

In practice, relatively few workers have an hours profile that asymptotes smoothly from 2,000 hours per year at age 55 toward zero at age 65. Frequently one observes a sharp downward adjustment in hours from 2,000 in year  $t$  to zero hours in year  $t+n$ , where  $n=1$  in many cases. In the standard life-cycle framework, workers maximize a lifetime utility function in consumption and leisure  $U = U(C_1, L_1, C_2, L_2, \dots, C_T, L_T)$  subject to known values of wage rates ( $w_i$ ) and prices ( $p_i$ ) in each period ( $i = 1, \dots, T$ ) and a known value of initial wealth ( $Z_0$ ). In this model, there are three ways to generate sharp changes in the expected paths of work and leisure.

First, defined benefit pension plans and Social Security produce well-known spikes in the market wage. There is a sharp increase in pension wealth at the age of eligibility for early or normal benefits, followed by extremely modest changes in pension wealth in subsequent years.

This would lead workers to make discontinuous changes in their work schedules. Likewise, eligibility for Social Security often produces sharp increases in retirement rates at age 62 (when workers become eligible for early benefits) or at age 65 (when workers become eligible for normal benefits).

Second, unexpected shocks to system parameters could generate discontinuities in the hours profile. For instance, an unanticipated deterioration in health increases the demand for leisure hours by increasing the marginal utility of leisure. In addition, workers who receive large, unanticipated capital gains become more likely to cut back labor hours.

Third, employers face significant transactions costs when they consider changing the work schedule for a subset of employees. Schedules of older workers have to be synchronized with those of other workers for a variety of reasons, including effective teamwork and meeting customer demands. To offset these costs, wages for older workers would have to be sharply reduced as they shift to part-time status. Such wage cuts are unlikely to be observed because of age discrimination laws and employee resistance, making gradual hours reductions a low probability event.

In practice there are some ways workers can achieve a gradual reduction in hours. Some firms hire back their own employees as consultants, but there are no hard data on the extent of this phenomenon. Bridge jobs are a widely used option. Ruhm (1990) found that in 1969-79 only 36 percent of household heads retired at the end of their career positions, and as many as half worked up to an additional five years. The majority of these jobs involve changes in occupation or industry from the career jobs. Although Ruhm does not compare earnings in bridge jobs to those in career jobs, one would expect wages at bridge jobs to be lower because of the inability to apply firm, industry or occupation-specific human capital from the career jobs.

Using the first three waves of the Health and Retirement Survey (1992, 1994, and 1996), Quinn (1999) found evidence of earnings erosion as workers moved from career to bridge jobs. Only 35 percent of his sample earned \$5 to \$10 an hour in their career job, but 61 percent earned that much in their bridge job.

### **Phased Retirement and Labor Supply**

In light of these alternatives, some employees are likely to find the ability to work part-time with their current employer to be an attractive option.<sup>7</sup> Wage offers from the career employer are likely to be much higher than those in other bridge jobs. By staying with the career employer, workers could continue to fully apply the specific capital that they already possess and have an incentive to continue to invest modestly. Employees also gain from avoiding the search and negotiation costs associated with finding a new positions. Finally, phased retirement provides an opportunity to cope more effectively with uncertainty about retirement. Prospective retirees lack information about retirement lifestyles and bridge jobs. Through a phased retirement program, they gain free time to collect information and make more informed decisions about their futures after they permanently leave their career employers.

The phased retirement program offered to tenured faculty in the UNC system gives faculty the option of working half time for a specified time period at half of their annual academic salaries. This is equivalent to an option to sell their labor back to the UNC system at a specified price. Before the introduction of phased retirement, the ability to re-contract for additional employment after retirement was negotiated privately among faculty, department heads, and deans. For faculty who could negotiate better terms than half their current salaries

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<sup>7</sup> Watson Wyatt Worldwide (1999) reports that 16 percent of the nearly 600 employers they surveyed have some form of phased retirement arrangements. Phased retirement programs were most prevalent among educational institutions with 36 percent of these employers offering such programs.

with either the UNC system or another employer, the work option provided by phased retirement would have little or no value. For faculty desiring part-time work and whose best offer would be below half of their current salaries, the phased retirement system could be quite attractive. Selection into the program will be a function of the best available part-time salary offer, either on or off campus.

A formal model of phased retirement in a life-cycle context is beyond the scope of this paper. Heuristically, consider a framework where workers have three options: full-time work in the career job, half-time work (either a bridge job or with the career employer), and zero work. The introduction of phased retirement increases the reward for half-time work for some employees and makes that option more attractive relative to the other two. One would expect an increased outflow of older employees from full-time work after the introduction of the phased retirement option.

Phased retirement offers some workers the opportunity to simultaneously increase income and free time. This condition will hold among employees for whom the sum of their pension benefits and half their salaries is greater than their current salaries (or equivalently, those for whom the pension benefits is greater than half their salaries). In a world where individuals are income maximizers in the static sense, one would expect all such employees to select phased retirement. In practice, not every person in this situation will select phased retirement because continued full-time work includes the option of earning greater pension wealth.

As mentioned above, some tenured faculty in the UNC system are covered by the state employees' retirement plan, which is a defined benefit plan, whereas others are covered by one of three defined contribution plans. Persons in a defined benefit plan face predictable spikes in pension wealth at the times when they become eligible for various benefit options. They face

variability in pension wealth, but barring changes in pension formulas or unexpected salary shocks they face little uncertainty. Those in defined contribution plans are subject to large changes in pension wealth depending on the success of their investments. They face both considerable variability and uncertainty. Phased retirement gives such workers the option of continuing to work within the university system while locking in recent capital gains.

Viewing phased retirement as an alternative to bridge jobs, its desirability increases with age. Assuming that bridge jobs require some investment in firm or industry-specific human capital, the time frame for benefiting from the returns from such investments is much longer for persons ages 55 to 60 who are contemplating retirement than it is for those near age 65.

### **Phased Retirement and Labor Demand**

Even with considerable employee demand for phased retirement, employers will not be expected to provide this option unless (1) employees are willing to pay for it through compensating wage differentials or (2) phased retirement leads to reduced unit costs. This discussion will focus on the latter possibility. In standard labor demand models, the demand for different types of workers is a function of their relative productivity and relative cost. Employers become more concerned about retaining older workers when there is an overall labor shortage or when employers decide to increase the relative share of older workers because of shifts in relative productivity or cost. The introduction of phased retirement should increase the retention of older employees by making bridge jobs less attractive relative to staying with the career employer, thereby lowering their relative cost by economizing on search and training expenses.

By providing phased retirement, employers also can economize on adjustment costs. Under a formal program of phased retirement, employees announce their intention to leave the

career employer 2 to 3 years in advance – much longer than the 3 to 6 months they usually give when they decide to retire or take a bridge job. The reduced uncertainty about when individuals will leave the organization can greatly facilitate succession planning and can potentially allow employers to avoid the costs of layoffs or early retirement buyouts.

Empirically, employers would want to know the impact of phased retirement on the overall flow of labor out of the organization and how that outflow varies by age and experience. They also would be concerned about how the provision of phased retirement would affect the quality mix of employees. Those who can earn significantly more than half their current salary while working halftime at their career jobs or in bridge jobs will not find the phased retirement option very attractive, whereas those unable to earn half their current salaries at part-time work elsewhere would find it more desirable. The magnitude of this potential adverse selection problem is an empirical question.

### **DETERMINANTS OF PHASED RETIREMENT**

The determinants of full and phased retirement are examined using the employment records of the entire UNC system from 1995 through 1999. Employment and retirement statuses are determined by comparing the position of each faculty member in one year compared to the previous year. For example, we examine all faculty members employed in 1997 and determine whether they are still employed in 1998 or whether they have completely retired from the university or entered phased retirement. The retirement rate for 1997 indicates that proportion of the faculty that were employed in 1997 but retired in 1998, while the phased retirement rate

indicates the proportion of faculty who were employed in 1997 but who were in phased retirement in 1998.<sup>8</sup>

Table 1 presents retirement rates for 1995 through 1998 and phased retirement rates for the first two years of the program, 1997 and 1998. These data show that prior to the introduction of phased retirement, just under 9 percent of the faculty retired in 1995 and 1996. After the introduction of the phased retirement plan, the proportion of faculty completely retiring dropped to 7.2 percent while 3.2 percent of eligible faculty members entered phased retirement. During the second year of the program, the retirement rate went back up to 9 percent and the phased retirement rate declined to 2.3 percent. These retirement patterns suggest that the introduction of the phased retirement program increased total retirement (complete plus phased), leading one to conclude that most phased retirees would have remained on the job in their tenured positions if this new retirement option had not been offered. Table 1 also presents the sample means over time for important characteristics of the faculty.

[Table 1]

Is a phased retirement rate of two to three percent large or small? Obviously, in absolute terms the number of phased retirees is relatively small with only about 60 people entering the program in each year. However, relative to the retirement rate, the phased retirement rate looks surprisingly large as the phased retirement rate has ranged between 25 and 45 percent of the retirement rate. In other words, there is about one phased retiree for each three retirees.

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<sup>8</sup> Due to the structure of the data, we actually counted any faculty member who exited the university from one year to the next as "retired". The faculty members counted as "phased" were those who were listed as phased retirees in the annual censuses.

Table 2 provides a closer look at the retirement and phased retirement rates by age. Faculty retirement rates are rather low at all ages. About 10 percent of faculty between the ages of 60 to 62 retire each year. In contrast, the retirement rates for faculty between the ages of 63 and 69 range between 15 and 30 percent per year. Surprisingly, the retirement rates for faculty ages 70 and over are also only about 15 to 30 percent. This same pattern of an increase in retirement rates by age that flattens out by age 65 does not prevail for phased retirement. In most cells the phased retirement rate is between 3 and 5 percent with no age pattern at all.

[Table 2]

Using the numbers in Table 2, we can calculate the mean ratio of phased retirees to retirees for each of the two years of the phased retirement program. The phased retirement rate was 45 percent of the retirement rate in 1997 and 25 percent of the retirement rate in 1998. This ratio is higher for faculty ages 55 to 61 than for faculty ages 62 and over. Thus, it appears that phased retirement is relatively more attractive to faculty in this age bracket.

### **Probit Analysis of Phased Retirement: 1997-98**

To further explore participation in the phased retirement program, a probit model is estimated using all eligible faculty for the two years that the program has been in existence. The dependent variable (Y) has a value of one if the person entered phased retirement and zero otherwise. Following Greene (2000), the probability of a faculty member entering phased retirement can be expressed as

$$P[Y = 1] = \int_{-\infty}^{\hat{a}'x} \phi(t) dt$$

$$= \Phi(\hat{\mathbf{a}}' \mathbf{x}),$$

where  $\phi(\cdot)$  is the density function of the standard normal distribution,  $\Phi(\cdot)$  is the cumulative distribution function of the standard normal distribution, and  $\mathbf{x}$  is a vector of explanatory variables including gender (male is the omitted category), race (white is the omitted category), rank (full professor is the omitted category), type of institution (research is the omitted category), annual salary divided by \$10,000, years of service, age, and type of pension plan (the ORP is the omitted category). The probit equation was estimated for 1997 and 1998 separately along with a pooled equation using both years of data. A test for the appropriateness of pooling indicated a stable structure over the two years.<sup>9</sup> Thus, Table 3 reports only the results of the pooled estimates. Both the coefficients and the estimated marginal effects are listed. The marginal effects of the independent variables are equal to

$$\frac{\partial E[y|\mathbf{x}]}{\partial \mathbf{x}} = \phi(\hat{\mathbf{a}}' \mathbf{x}) \hat{\mathbf{a}}.$$

[Table 3]

The estimated effects shown in Table 3 may seem small. However, it is important to consider the size of these effects relative to the predicted probability of entering phased retirement. Using the estimated coefficients, a predicted probability can be calculated for a "base

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<sup>9</sup> A likelihood ratio test was used to test the null hypothesis that the probit equations are stable across the two years. The test statistic is distributed  $\chi^2$  with degrees of freedom equal to the number of restrictions imposed. In this case, the test statistic was equal to 14.04 (which is less than the critical value of 21.03). Thus, the null hypothesis could not be rejected.

case" observation. The base case chosen in this study is a white male full professor who is employed at a research university, age 58, with 24 years of service, earning \$75,000 per year, and enrolled in the ORP pension plan. Given these characteristics, the base case probability of entering phased retirement is estimated to be 0.80 percent.

The estimates in Table 3 indicate that faculty at doctoral universities, masters-awarding universities and baccalaureate universities within the UNC system are more likely to enter the phased retirement program than those at the UNC-Chapel Hill and NC State University. Conceivably, faculty at the research universities have more options for bridge jobs than faculty at other institutions and thus have less interest in phased retirement. Older faculty are more likely to enter phased retirement. Although Table 2 showed no linear effect of age on phased retirement decisions, this probit result could reflect extremely low phased retirement rates for those under 55. Non-white faculty are less likely to have entered the phased retirement program. No statistical differences in enrollment rates are observed by gender or faculty rank.

### **Probit Analysis of Retirement: 1995-96**

The above results can be compared to a retirement equation estimated for the two years immediately prior to the introduction of the phased retirement plan. In this case, the dependent variable is equal to one if the individual retired and is equal to zero otherwise. Once again, the probit was estimated separately for 1995 and 1996. We then tested whether it was appropriate to pool the two years. The test indicated that the structure of the retirement equation was stable between the two years and pooling was appropriate.<sup>10</sup> Results from the pooled retirement

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<sup>10</sup> The likelihood-ratio test statistic was 18.74, which is lower than the critical value of 21.03. Therefore, the null hypothesis could not be rejected.

equation are presented in Table 4. A base case probability (for the same characteristics) was also calculated using the estimated coefficients. This base case probability of retiring is 3.7 percent. The estimated coefficients indicate that retirement rates are higher in the non-research universities than at UNC-Chapel Hill and NC State. Assistant professors and females have higher retirement rates as did participants in the state retirement plan. Retirement probabilities also increase with age.

[Table 4]

### **Where Do Phased Retirees Fit? Probit Analysis of "Retirement": 1997-98**

The results shown in Tables 3 and 4 provide us with some insight into the factors that influence a faculty member's decision to enter phased retirement along with the decision to enter retirement (when the phased option was not available). However, this does not provide us with an answer to one of our key questions: What would those faculty members who chose phased retirement have done in 1997 and 1998 if phased retirement had not been an option? Would they have remained as active full-time faculty members or would they have chosen to retire completely? We saw from the retirement rates in Table 2 that it appears that total retirement (complete plus phased) increased during 1997 and 1998. If retirement rates are stable over time, this suggests that many of the faculty choosing phased retirement would have elected to remain full-time had the option of phased retirement not been available.

Although there is some survey evidence on why faculty selected phased retirement, it does not help resolve this issue. The University of North Carolina system conducted a survey of those who participated in the first wave of phased retirement. When asked why they entered the

phased retirement program, 60 percent said they wanted to gradually transition into retirement, 18 percent said they planned to pursue other interests, 6 percent planned to pursue other employment, and 16 percent cited other reasons such as research opportunities.

To further investigate the question of what phased retirees would have done if the program had not been available, two additional probit equations were estimated using the 1997-98 data. In the first, the dependent variable was equal to one if the individual entered either complete or phased retirement and was equal to zero if the individual remained a full-time faculty member. Thus, phased retirees were included in the same category as retirees. The results from this estimation are presented in Table 5. The estimated base case probability (using the same characteristics discussed above) of entering one of these types of retirement is 4.2 percent.

[Table 5]

As you can see from Table 5, many of the same factors that were significant in our retirement probit estimation of the 1995-96 data are also significant here. The probability of entering retirement (either complete or phased) is higher for females, associate and assistant professors, enrollees of the state pension plan, and faculty at non-research universities. Increases in both age and years of service also increase the probability of entering one of the two types of retirement. In addition, non-whites have a lower probability of retiring.

In the second probit equation estimated using the 1997-98 data, the dependent variable is equal to one if the individual completely retired and is equal to zero if the individual chose phased retirement or remained as a full-time faculty member. Therefore, in this estimation, the

phased retirees were grouped together with the faculty members who chose to continue working full time. The results from this estimation are reported in Table 6. The estimated probability of the base case individual choosing to completely retire is 3.5 percent. The estimated coefficients and effects in Table 6 are similar to those in Table 5, with two noteworthy exceptions. First, salary is positive and significant. Second, participating in the state pension plan does not have a significant effect on the probability of retiring.

[Table 6]

These two probit equations can be compared to the estimated retirement probit equation using the 1995-96 data (Table 4). To understand in which category the phased retirees would best fit if phased retirement had not been an option, we must determine which definition of retirement best suits the data. Should only those who completely left the university be counted as retired, or should the “retirement” category include those who entered phased retirement as well? We can provide some answer to this question using the probit equations estimated above. Specifically, we tested to see if the retirement probit equations using the 1997-98 data (Tables 5 and 6) could be pooled with the estimated retirement equation using the 1995-96 data (Table 4). The tests concluded that the 1997-98 retirement probit with the dependent variable equal to one only if the individual completely retired (Table 6) could be pooled with the 1995-96 data to estimate a retirement equation. However, when "retirement" is defined to be both complete or phased retirement, the data cannot be pooled.<sup>11</sup> Assuming that the estimated retirement

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<sup>11</sup> When the phased retirees were included with the active workers (and thus only those who completely retired were considered as retired), the likelihood-ratio test statistic was 13.20. This is lower than the critical value of 21.03. However, when the phased retirees were included with the retirees, the likelihood-ratio test statistic was equal to

equations are stable over time, this implies that the phased retirees "fit better" when not counted as retired.<sup>12</sup> Thus, the data indicate that the phased retirees of 1997-98 more closely resemble faculty members choosing to remain full-time in 1995-96 than those who chose to completely retire in 1995-96.

## CONCLUSIONS

While life-cycle theory has long suggested that workers would prefer to gradually enter retirement from their career jobs, little evidence exists that such an option is available for most workers. This study provides a first look at the effects of the introduction of a phased retirement program on workers' retirement decisions. Using data from the 15 campuses of the University of North Carolina system, we examined the change in retirement behavior of tenured faculty members after the introduction of a phased retirement program. During the first two years of the program, approximately three percent of eligible faculty chose the phased retirement option. This increased the total retirement rate (complete retirement plus phased retirement) by between 25 and 45 percent each year.

An important policy question for academic administrators is to understand what types of faculty members choose to enter phased retirement. Would these faculty members have remained full-time or have completely retired if the phased retirement option were not available? In other words, does the introduction of a phased retirement program shorten or lengthen these faculty members' careers with the university? Our analysis indicates that most of the faculty

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23.87. Because the test statistic exceeds the critical value, the null hypothesis that the probit equations are stable across the two time periods is rejected.

<sup>12</sup> We also checked to see which of the two estimated retirement equations did a better job correctly predicting the outcome of the retirement decision. The estimated retirement probit equation from Table 6 (where the dependent variable was equal to one only if the individual completely retired) correctly predicted the outcome 93 percent of the time, while the equation from Table 5 (where the dependent variable was equal to one if the individual chose either complete or phased retirement) correctly predicted the outcome 85 percent of the time.

choosing the phased retirement option likely would have remained full-time at their universities if the phased retirement option had not been available.

The evidence here indicates that many tenured faculty members view phased retirement as a desirable alternative to remaining full-time at the university or retiring completely. However, because university faculty are not representative of the labor force at large, it is unclear whether these results can be generalized to those employed outside of academia. Future research is needed in this area to understand the impact of phased retirement programs in other sectors of the labor market.

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**Table 1 – Sample Means**

<b>Variable</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
Retired	0.087	0.088	0.072	0.090
Phased	N/A	N/A	0.032	0.023
Female	0.159	0.165	0.173	0.180
Non-White	0.122	0.125	0.128	0.135
Salary/10,000	7.050	7.461	7.759	7.948
Years of Service	24.755	24.867	24.386	24.392
State Pension Plan	0.669	0.630	0.573	0.536
Age	58.087	58.210	58.134	58.225
<b>Rank:</b>				
Professor	0.714	0.718	0.716	0.721
Assoc. Professor	0.231	0.235	0.238	0.237
Asst. Professor	0.052	0.046	0.044	0.041
<b>Type of Institution:</b>				
Research	0.457	0.466	0.453	0.455
Doctoral	0.180	0.176	0.179	0.174
Masters	0.329	0.323	0.335	0.336
Baccalaureate	0.033	0.035	0.033	0.034
<b>N</b>	<b>2,167</b>	<b>2,216</b>	<b>2,425</b>	<b>2,468</b>

**Table 2 – Retirement Rates by Age Group**

	<b>1995</b>	<b>1996</b>	<b>1997</b>		<b>1998</b>	
	<b>Retired</b>	<b>Retired</b>	<b>Retired</b>	<b>Phased</b>	<b>Retired</b>	<b>Phased</b>
<b>Mean</b>	8.72	8.80	7.18	3.22	9.00	2.27
<b>By Age:</b>						
50-54	1.28	1.96	2.18	0.29	2.33	0.16
55-59	4.95	5.37	3.51	3.38	4.65	1.93
60-61	7.86	11.11	10.69	5.35	11.40	3.58
62	7.92	10.67	12.12	3.03	12.90	3.23
63-64	24.65	18.62	14.68	5.05	17.15	3.35
65	22.08	21.74	22.08	5.19	18.64	10.17
66-69	30.00	22.92	17.22	3.97	23.70	4.05
70+	16.00	30.77	13.64	15.91	30.00	5.00

**Table 3 – Phased Retirement Probit Estimation**  
(1997 & 1998 pooled)

<b>Variable</b>	<b>Coefficient (standard error)</b>	<b>Marginal Effect</b>
Constant	-6.25* (0.56)	----
Female	0.02 (0.11)	0.10
Non-White	-0.53* (0.15)	-1.53
Salary/10,000	-0.03 (0.02)	-0.11
Years of Service	0.01* (0.01)	0.06
State Pension Plan	0.27* (0.10)	1.10
Age	0.06* (0.01)	0.27
<b>Rank:</b>		
Assoc. Professor	0.04 (0.10)	0.17
Asst. Professor	0.02 (0.18)	0.07
<b>Type of Institution:</b>		
Doctoral	0.44* (0.11)	2.55
Masters	0.30* (0.11)	1.40
Baccalaureate	0.42** (0.22)	2.66
<b>N</b>	4,893	
<b>Log-likelihood</b>	-549.05	

\* " < 0.05, \*\* " < 0.10

**Table 4 – Retirement Probit Estimation**  
(1995 & 1996 pooled)

<b>Variable</b>	<b>Coefficient (standard error)</b>	<b>Marginal Effect</b>
Constant	-8.22* (0.42)	----
Female	0.22* (0.08)	2.98
Non-White	-0.44* (0.10)	-4.02
Salary/10,000	-0.00 (0.01)	-0.00
Years of Service	0.01* (0.00)	0.15
State Pension Plan	0.13** (0.07)	1.54
Age	0.11* (0.01)	1.25
<b>Rank:</b>		
Assoc. Professor	0.08 (0.08)	0.99
Asst. Professor	0.30* (0.12)	4.32
<b>Type of Institution:</b>		
Doctoral	0.12 (0.08)	1.54
Masters	0.21* (0.08)	2.59
Baccalaureate	0.33* (0.16)	4.89
<b>N</b>	4,383	
<b>Log-likelihood</b>	-1118.00	

\* " < 0.05, \*\* " < 0.10

**Table 5 – Retirement Probit Estimation**  
(1997 & 1998 pooled [phased retirees counted as retired])

<b>Variable</b>	<b>Coefficient (standard error)</b>	<b>Marginal Effect</b>
Constant	-7.56* (0.36)	----
Female	0.27* (0.07)	4.48
Non-White	-0.43* (0.09)	-5.08
Salary/10,000	0.01 (0.01)	0.12
Years of Service	0.01* (0.00)	0.22
State Pension Plan	0.14* (0.06)	2.08
Age	0.09* (0.01)	1.38
<b>Rank:</b>		
Assoc. Professor	0.18* (0.07)	2.86
Asst. Professor	0.34* (0.12)	6.13
<b>Type of Institution:</b>		
Doctoral	0.36* (0.07)	6.24
Masters	0.26* (0.07)	4.02
Baccalaureate	0.48* (0.14)	9.43
<b>N</b>	4,893	
<b>Log-likelihood</b>	-1458.47	

" < 0.05, \*\* " < 0.10

**Table 6 – Retirement Probit Estimation**  
(1997 & 1998 pooled [phased retirees counted as active workers])

<b>Variable</b>	<b>Coefficient (standard error)</b>	<b>Marginal Effect</b>
Constant	-7.23* (0.38)	----
Female	0.31* (0.07)	4.25
Non-White	-0.32* (0.09)	-3.13
Salary/10,000	0.02** (0.01)	0.18
Years of Service	0.01* (0.00)	0.13
State Pension Plan	0.06 (0.07)	0.76
Age	0.09* (0.01)	1.03
<b>Rank:</b>		
Assoc. Professor	0.20* (0.07)	2.55
Asst. Professor	0.39* (0.12)	5.96
<b>Type of Institution:</b>		
Doctoral	0.24* (0.08)	3.21
Masters	0.18* (0.07)	2.24
Baccalaureate	0.39* (0.15)	6.12
<b>N</b>	4,893	
<b>Log-likelihood</b>	-1220.18	

\* " < 0.05, \*\* " < 0.10