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Older public sector workers' retirement planning, participation, and preparedness

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Once retired from a career job, individuals must live off savings, Social Security, and pensions or earnings from post-retirement work. Those who have made adequate plans for retirement are more likely to be able to meet their desired levels of consumption once retired and are less likely to end up relying on public assistance or having to reenter the labor market. While much attention has been paid to participation in voluntary retirement saving plans, less is known about workers' planning for retirement. Using administrative records linked to a large-scale survey, we explore what factors are associated with both objective and subjective measures of planning for retirement among public sector workers in North Carolina. We find that only about half our sample of workers ages 50-69 have made a retirement plan. We show that individuals who exhibit higher levels of time discounting, or impatience, are also less likely to plan for retirement and that financial literacy is associated with higher rates of planning. We also show that planning is related to wealth accumulation and retirement preparedness.

I.   Introduction

To achieve financial security during retirement, workers must effectively plan for retirement by choosing an optimal level of saving, a target date for retirement, and a plan for working (or not) after retiring from career employment. If workers do not adequately plan for retirement, they may accumulate insufficient wealth and run the risk of outliving their resources. Workers nearing the transition from career employment to retirement need to make complex, often irreversible, financial decisions. Increases in life expectancy raise the cost of making poor decisions concerning financial matters such as the annuitization of pension benefits, contributions to supplemental retirement plans in the years leading up to retirement, the age at which an individual retires from a career job, and the choice to return to work post-retirement (Shoven, 2010). Lack of planning for retirement or poor decision-making could lead to economic hardship during retirement for an individual and, potentially, for his or her surviving spouse.

By combining administrative records from the North Carolina Department of State Treasurer, Retirement Systems Division (RSD), which administers the primary pension plan for state and local public employees, with a survey of public sector employees aged 50-69, we have constructed a data set that includes both objective and subjective measures of retirement planning. The administrative records contain a rich set of covariates for each employee, including earnings, job information, years of service, creditable service, and expected pension benefit. We observe basic demographic information in the administrative data, and we supplement this demographic information for survey respondents with their responses to survey questions about race/ethnicity, education level, marital status, as well as various questions about their spouses' characteristics (if applicable). The survey also included questions that test respondents' financial literacy objectively in addition to questions intended to elicit a self-rated

measure of financial knowledge, as well as sources of information that respondents typically rely on when making financial and retirement decisions. Finally, the survey included questions based on similar questions in the Health and Retirement Study that attempt to ascertain individual time preferences and levels of risk aversion to categorize respondents as more or less risk averse and more or less patient, respectively (Barsky et al., 1997).

Lifecycle models of economic behavior typically assume that individuals maximize lifetime utility by considering their behavior today and in all future periods. Saving and consumption choices, along with work and leisure decisions, determine period-specific utility. Individuals must consider how their choices today affect future utility, that is, more consumption today means less income for future consumption. Thus, standard lifecycle models assume that individuals are "planners" who assess how each period's resource allocation influences future resource constraints. However, considerable evidence indicates that many individuals are not, in fact, planners; in the context of a lifetime plan, significant differences in measures of planning emerge across individuals based on their risk and time preferences. Some individuals may exhibit low levels of planning due to very high discount rates (i.e., impatience) or a lack of financial literacy, which could limit an individual's ability to evaluate the tradeoff between present and future consumption. In this paper, we examine the extent of planning by public employees who are near retirement and estimate the determinants of planning. In addition to examining the planning process, we explore the role of planning in retirement saving and preparedness.

While there is an emerging literature on retirement planning and its affect on economic well-being in retirement, it is limited and has not yet focused directly on public employees. Ameriks, Caplin, and Leahy (2003) developed a propensity to plan model and concluded that

their results "support a theory in which the channel connecting wealth accumulation and the propensity to plan operates through a form of 'effortful self-control'" (p. 1009). This theory suggests that individuals with a high propensity to plan tend to notice spending errors, make appropriate behavioral adjustments, and, consequently, accumulate more wealth, whereas those with a low propensity to plan tend to overlook such errors and continue to overspend while working and accumulate less retirement wealth as a result. Their findings suggest that variation in wealth levels, conditional on earnings, may be attributable to differences in planning behavior and preferences. Using survey data and administrative records for participants in TIAA-CREF, Ameriks, Caplin, and Leahy find support for their hypotheses that there are differences in the propensity to plan across individuals and that these differences are associated with observed variation in retirement wealth accumulation.

Lusardi and Mitchell (2014) provide a detailed review of research on financial literacy and how it is related to planning and wealth accumulation. Lusardi and Mitchell (2007) examine survey responses from the HRS for the cohorts introduced in 1992 and 2004. They analyze responses to planning and literacy questions and link planning to wealth accumulation. They conclude that financial literacy predicts planning and that planning affects saving and wealth accumulation. In a related paper, Lusardi and Mitchell (2008) examine these same relationships focusing solely on the decisions of women. They report, based on a series of studies and surveys, that older women have very low levels of financial literacy and that many have not undertaken any retirement planning. They argue that more financially literate women are also more likely to be planners. Using Dutch data, Van Rooij, Lusardi and Alessie (2012) also find a strong

association between financial literacy and retirement planning and with wealth accumulation.[1] These studies highlight the importance of two significant relationships: the relationship between financial literacy and planning, and the relationship between planning and retirement wealth accumulation. We build on this work by emphasizing the importance of time discounting preferences and financial literacy. Further, we expand the concept of planning to include planned age at retirement and plans for working after retirement from a career job in the public sector. Finally, we narrow our focus on retirement planning to public sector workers, who remain remarkably understudied as a distinct group in the prevailing literature.

While economists have long been interested in the transition from work to retirement, relatively few studies have considered public sector workers as a separate group. Public sector employees, including state, local, and federal governmental employees, comprise approximately 18 percent of the U.S. non-farm labor force.[2] In general, public sector workers are more likely to be covered by defined benefit (DB) pension plans and retiree health insurance. The model of deferred compensation, in combination with a relatively stable size of the workforce, may attract workers who are particularly risk averse or who demonstrate more "patience" towards the timing of compensation and consumption. Because public workers seem to have different risk and time preferences and receive very different compensation packages than their private sector counterparts, results from studies examining the retirement planning and preparedness of private sector workers do not necessarily apply to public sector workers.

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[1] The *Journal of Pension Economics and Finance,* volume 10, no. 4 (2011) has a series of articles examining the link between financial literacy and retirement planning in various developed countries.

[2] See Bureau of Labor Statistics, Current Employment Statistics, http://www.bls.gov/web/empsit/ceseeb1b.htm, [accessed October 2, 2014].

This study focuses specifically on public sector workers in North Carolina aged 50-69. Income in retirement may be a more salient concern for this group of workers, as they are generally approaching normal retirement age. As such, we expect that workers over age 50 will be the most engaged in retirement planning of all age groups. Many public sector workers are eligible for normal retirement in their 50's. While Social Security and DB pension benefits may provide a reasonably satisfactory replacement rate immediately upon retirement for lower earning workers with many years of service, cost of living adjustments (COLAs) in the DB plan are not guaranteed and retirees may see the real value of pensions declining over time. The DB plan provided to public workers in North Carolina is typical in this regard, as only a few state employers offer a defined contribution plan as the primary or mandatory pension.

As in North Carolina, most governmental employers offer their employees the opportunity to participate in voluntary retirement saving plans in addition to the mandatory pension. As state and local governments reduce the generosity of the mandatory DB plans, the importance of these supplemental retirement plans will increase. Increasing longevity and health care expenses, along with likely changes in Social Security and Medicare, will strengthen the need for public employees to participate in and contribute to supplemental retirement saving plans. Thus, wealth accumulation can be particularly important for public sector workers who have, on average, earlier retirement ages.

II.   North Carolina Public Sector Workers and Description of the Data

On most dimensions, North Carolina, its population, and its public sector retirement systems are broadly representative of the nation and state and local retirement plans (see Appendix A). With the exception of university faculty, all full-time employees working for a state agency in North Carolina, as well as teachers employed by local public school systems, are

required to enroll in the Teachers' and State Employees' Retirement System (TSERS), which is the largest state-managed DB plan administered by the North Carolina Retirement Systems Division (RSD). Most municipal, county, and other local governmental employers participate in the Local Governmental Employees' Retirement System (LGERS), the second largest state-managed DB plan in North Carolina. Most state and many local employees are also eligible to participate in the two state-managed voluntary supplemental retirement saving plans, the NC 401(k) Plan and the NC 457 Plan, in addition to other voluntary supplemental retirement saving plans administered by North Carolina public employers (i.e., local 457 plans or 403b plans for school district employees).[3]

We created our data set by combining a survey of public sector workers aged 50-69 with corresponding administrative records maintained by the North Carolina Retirement Systems Division (RSD). The retirement system data provide basic demographics (gender and date of birth), details about employment history (date of hire, agency of employment, and service credit information including membership, non-contributory, and purchased service), and salary information from 2008-2013. We combined these data with records of participation and individual account balances in the state-managed NC 401(k) and NC 457 plans.[4]

The data have a rich set of indicators of planning behavior, including both subjective and objective measures of the propensity to plan. The subjective measures of planning come from individual survey responses: the key subjective measure comes from a survey question aimed at

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[3] School districts also offer employees locally-managed 403(b) plans. A state-managed 403(b) plan for employees of school districts is being implemented this fall. See www.nctreasurer.com/Retirement-and-Savings/Managing-My-Retirement/Pages/NC-403b-Program.aspx for more information.

[4] Appendix B describes the data in more detail.

determining the extent to which a respondent has thought about retirement and/or formulated a retirement plan. Each respondent had the option to indicate that he/she: (1) has a retirement plan; (2) has thought about retirement but does not have a plan; or (3) has not thought about retirement at all. Additional indicators of retirement planning behavior come from other questions related to other, more specific retirement plans and expectations: most notable among these indicators are the survey responses to questions regarding expected retirement age and plans to return to work post-retirement.

We draw objective measures of planning from the administrative data, specifically from an employee's use of the Online Retirement Benefits through Integrated Technology (ORBIT) website. ORBIT allows members of the retirement systems to access their retirement account information and provides various self-service tools designed to help members make retirement planning decisions.[5] Members can determine their years of service, salary, and account balance information from simply logging into the ORBIT site. In addition, a member can engage in a more intensive form of planning in the ORBIT system by requesting a 'self-service estimate.' While technically an individual can determine their expected annual benefit using the annuity formula, the actuarial factors used are somewhat sophisticated. In fact, the member services staff at RSD and the employers' human resources staff regularly refer workers to the ORBIT Self-Service Estimator to obtain estimated benefit information rather than conducting the calculation on behalf of the employee. Because the standard policy is to refer individuals to conduct a self-service estimate in this system, we believe that those who are actively planning are very likely to

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[5] ORBIT allows active employees to access service credit and contribution history, annual benefit statements, service purchase cost estimates, pension benefit estimates, and NC 401(k)/NC 457 Transfer Benefit estimates. See Appendix A3 for an example of the information available in ORBIT.

have logged into ORBIT and conducted this estimate, even if they are seeking advice from an investment advisor.[67]

To create an objective measure of planning, we observe whether employees requested a pension benefit estimate from ORBIT in the last year (i.e., self-service estimate), logged into ORBIT but have not requested a self-service estimate in the last year, or have not logged into ORBIT at all in the last year. We chose to use a 12-month timeframe because RSD sends communications encouraging employees to login to ORBIT to review their personal benefit account several times a year and provides an annual benefit statement that is only accessible through ORBIT. Thus, we believe that a member actively planning for retirement would likely check their ORBIT account at least annually.[8]

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[6] A screenshot of the Self-Service Estimator utility is included in Appendix A4. The tool allows the member to enter expected sick leave and annual leave. It then uses employment records on years of service, age, and salary to calculate the amount of each of the annuity payment options. The estimator includes expected Social Security benefits but does not account for income growth.

[7] Staff at RSD report that an active employee engaging in retirement planning would need to log-in to the ORBIT website on a regular basis. RSD asks that employers allow their employees to check their ORBIT accounts at work and that they provide computer access to employees who do not regularly have access to a computer at work. The only ways an active employee can estimate their retirement benefit is to: (1) use the self-service estimator, (2) request a detailed estimate (only possible within 2 years of retirement and requires 3-6 weeks for processing), or (3) calculate the benefit on their own using the tables found at: https://www.nctreasurer.com/ret/Employers/EarlyandOptionalFactorsEff01012012.pdf. This latter option requires an individual know all the particulars regarding contract periods, leave accrual, longevity, and sick leave. Except in rare cases, RSD does not provide retirement benefit estimates in any other way.

[8] Results are similar when not imposing the 12-month timeframe.

III.   Why does planning matter?

We begin our empirical analysis by demonstrating that planning matters, specifically showing that our measures of planning are correlated with important outcomes of interest concerning wealth and savings. As discussed earlier, the related literature has produced a set of findings that suggest the importance of planning in the determination of sufficient lifetime income, albeit with data that are, in some ways, less rich than ours. Ameriks, Caplin, and Leahy (2003) find quantitatively and significantly meaningful effects of planning on an individual's net worth. Using the HRS, Lusardi and Mitchell (2007) find a similar result and attempt to isolate the causal effect of planning with an instrumental variable related to housing wealth. The authors find that the strong effect of planning on wealth and savings continues to hold when reverse causality is addressed.

As a subjective measure of planning, we use responses to a multiple choice survey question regarding retirement planning. When asked whether they had planned for retirement, 1,094 respondents reported having made a retirement plan, 880 reported having thought about it but not having a plan, and 274 reported not having thought about it. As self-reported planning increases, the following variables increase monotonically: salary, level of patience, financial literacy, years of service, reliance on formal sources of financial information, supplemental retirement saving plan participation, and wealth. In contrast, we find no clear correlation between self-reported planning and risk aversion. For the regression analysis, we classify individuals as "planners" or not. To achieve a dichotomous classification, we compare the characteristics of individuals in the three groups. In terms of supplemental plan participation and wealth accumulation, the two groups of respondents who reported not having a plan (columns 2 and 3) are more similar to one another (qualitatively) than respondents who reported not having a plan.

Furthermore, while "thinking about" retirement is a somewhat nebulous concept, having made a retirement plan is a concrete indication of having "planned." As a result, for the regression analyses, we split individuals according to whether they have made a retirement plan or not by grouping together the second and third categories of self-reported planning.

[Table 1]

As described in Section II, we have three classifications of the objective measure of planning: 1,213 respondents have requested a self-service defined benefit estimate, 316 have logged into ORBIT but have not requested an estimate, and 719 have not logged into ORBIT (all defined based on activity during the last 12 months). Respondents in the high planning category on the objective measure have used their ORBIT account to calculate an estimated benefit upon retirement, which could indicate a high level of retirement planning. Respondents in the low planning category have not recently logged into the ORBIT website, which means they have not reviewed their most recent annual benefit statement or any other details pertaining to their individual retirement account. Similar relationships exist for the objective measure as with the subjective measure (see the right panel of Table 1), where high planning is correlated with outcomes that are associated with higher wealth and savings. On several measures, the relationships appear to be stronger for the subjective measure than the objective measure, which is confirmed later in the regression analyses.

Table 2 shows that planners are more likely to report confidence in their retirement savings, where confidence is assessed with four different questions, all of which show confidence to monotonically increase with the degree of planning. Further, Table 3 shows that the subjective measure and the objective measure are correlated. Respondents who have requested a self-service estimate are more likely to report having a retirement plan than

respondents who have logged in but have not requested an estimate. However, 11 percent of our sample reported having a retirement plan but have not logged into ORBIT in the past 12 months. This suggests that these individuals are making a plan based on their personal records and do not feel the need to access their retirement system account on an annual basis or to use any of the retirement planning tools available in ORBIT. We discuss the relative informativeness of the subjective and objective measures after they are used in the regression analyses.

[Table 2]

[Table 3]

Overall, the data suggest that planning matters for wealth and savings and that our measures of planning are picking up important differences across respondents that reliably segment respondents according to their propensity to plan. Our results, along with the previous literature, point toward an important role for planning. As a result, the following section asks which observable characteristics about respondents are associated with planning behavior.

IV.   Who is planning for retirement?

We next explore the characteristics of workers that are associated with both objective and subjective measures of planning for retirement among public sector workers in North Carolina. Table 4 presents results from a regression on our two main measures of planning. The dependent variable in Column (1) is whether the individual reports having made a retirement plan, while Column (2) presents estimates from a regression on whether the individual has requested a self-service estimate through the ORBIT system. About 49 percent of the population is a "self-reported planner" and about 54 percent of the population has requested a self-service estimate. The regressions are estimated using a linear probability model. Appendix Table B4 presents summary statistics for the variables included in the regression model.

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We first consider the demographic characteristics of planners. When interpreting the coefficients it is important to keep in mind that all workers in the sample are over age 50. In addition, the expected DB pension level is a function of years of service and salary and the expected date of normal retirement is a function of years of service and age. Thus, separately identifying the effects of age, years of service, salary, expected retirement age, and expected defined benefit amount is not possible. Interestingly, we see that those with more years of service are more likely to have requested self-service estimates of their expected pension benefit within the last 12 months, although there is no relationship between years of service and the subjective measure of planning. Higher earners are significantly more likely to be planners.

Conditional on salary, we see no differences in levels of planning between those with and without a college degree. Being white is associated with an 8 percentage point higher probability of requesting a self-service estimate (about 15%), but race does not predict the self-reported measure of planning. On the other hand, married individuals are 10 percentage points more likely to self-report having made a plan, but are no more likely to have requested a self-service estimate than single workers. . Home owners are significantly more likely to report having made a plan, but are no more likely to have requested a self-service estimate. Again, this illustrates that the objective and subjective measures are capturing something different about the planning process. Print surveys were sent to those for whom we could not obtain a valid email address. Thus, it is not surprising to find that those receiving a print survey were less likely to be classified as planners, particularly when planning is measured as having logged into the ORBIT system. In summary, while we find that higher earners, whites, and those that are married are more likely to

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be planners, we do not find any differences in planning (objective or subjective) between men and women in our sample.

A. Preferences over risk and time

Next, we consider how an individual's tolerance for risk and time discounting affects whether or not they have begun planning for retirement. Our measures of risk and time preferences are from questions in our survey that were adapted from the HRS (Barsky et al., 1997). On risk preferences, respondents were given a hypothetical situation in which they would choose one of two new jobs, one with a constant income and one with an income that is 100 percent higher or 20 percent lower (with the increase or decrease equally likely). Among respondents who answered this question, 74 percent chose the safe job (more risk averse) and 26 percent chose the risky job (less risk averse). See Appendix C for a description of the questions and responses.

On time preferences, respondents were given two questions. The first question presents a choice between a prize payout of $1,000 today or $1,200 in one year, which is referred to as the lottery frame. The second question presents a choice between $1,000 per month in Social Security benefits or $500 per month plus a one-time, lump-sum payment of $80,500, which is referred to as the benefit frame. Given the important role we expected time preferences to play in retirement decision making, we used two frames in order to control for contextual effects as individuals respond to survey questions on hypothetical intertemporal decisions. With the lottery frame, 48 percent of those answering the question choose the later, larger payment (more patient). With the benefit frame, 41 percent of those answering the question choose the larger benefit and no lump sum (more patient).

The results in Table 4 show that more risk averse respondents are more likely to plan according to the subjective and objective measures but both effects are small and statistically insignificant. More patient respondents are more likely to plan according to the subjective measure but not the objective measure. The patience result holds for both the lottery and benefit frames, with an estimate of 7.7 percentage points more likely to plan with the lottery frame and 6.4 percentage points with the benefit frame.

The relationship between patience and planning intuitively reflects a more patient individual's willingness to incur time and effort costs today in order to increase income security in the future. However, the difficulty of measuring time preference has led the previous literature to use proxies for patience, which have led to null findings in some case.[9] Our validated survey-elicited measures of time preferences represents an improvement on the previous literature and suggests the importance of controlling for individual preferences when modeling retirement planning.[10] Further, the finding that time preferences have more predictive power than risk preferences is novel. It is intuitive that planning for lifetime income security over long horizons will depend on an individual's degree of patience to a large extent but the literature has been more focused on risk preferences. Our results suggest than patience matters and should be explored more fully moving forward.

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[9] For example, Van Rooij, Lusardi, and Alessie (2012) find no relationship between drinking/smoking behavior and net worth.

[10] Our survey-based measures of risk and time preferences have been used widely in a number of fields of economics and have been shown to be correlated with behavior including investments, cancer screenings, drinking, marriage, and fertility (Anderson and Mellor, 2009; Barsky et al., 1997; Dave and Saffer, 2007; Picone et al., 2004; Schmidt 2008).

Related to our results on time preferences, Brown and Previtero (2014) present evidence of important differences in retirement decision making by individuals whose intertemporal preferences exhibit time inconsistency by overweighting present consumption relative to future consumption, which manifests itself as procrastination. Using administrative data on employees in the University of Illinois system, the authors classify procrastinators as employees who choose their health care plan on the last day of the open enrollment period. Relative to non-procrastinators who make their election earlier in the enrollment period, procrastinators contribute less to their retirement and are less likely to participate in supplemental retirement plans. These findings support ours in the sense that the individuals that we have identified as more impatient are likely to be similar to the procrastinators identified in Brown and Previtero (2014).

To further explore the role of risk and time preferences, we analyze potential interactions between these preferences in their determination of planning behavior, using a bivariate categorization based on risk and time preferences. We use the lottery frame for time preferences because it is more highly correlated with planning. The interaction creates four groups: more patient and more risk averse respondents; more patient and less risk averse respondents; less patient and more risk averse respondents; and less patient and less risk averse respondents (the omitted group). In unreported results, we rerun the regression from Table 4 with these interactions for risk and time preferences, along with all other covariates.[11] For subjective planning, the ordering of the four groups is consistent with the main results: from high planning to low planning, more patient and more risk averse; more patient and less risk averse; less patient and more risk averse; and less patient and less risk averse. However, at a given level of patience,

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[11] These regression results are available from the authors upon request.

there is only a small difference in planning when moving between the two risk categories. These results suggest that more patience increases planning meaningfully, more risk aversion increases planning slightly, and there are no meaningful interactive effects between the two sets of preferences.

B. Financial Literacy

Recent research has suggested an important role for financial literacy in planning and preparedness for retirement. Although the North Carolina DB pensions plus Social Security provide automatic annuitization, retirees may need to supplement their income in retirement through their savings, or through post-retirement labor income. In order to determine how much to save prior to retirement and the optimal level and type of disposition of wealth upon retirement, an individual requires a certain level of financial sophistication. Retirement income security depends on having sufficient understanding of employer-provided retirement benefits, Social Security, Medicare, and general financial management. However, considerable recent evidence indicates that American workers have a relatively low level of financial literacy (see, e.g., Lusardi and Mitchell, 2014 and references therein). If a higher level of financial literacy encourages workers to plan for retirement, and ultimately to be more prepared for retirement, then this suggests an important role for financial education aimed at improving financial literacy. Recent research suggests that employer-provided financial education seminars for those nearing retirement can be an effective way to increase knowledge and alter retirement plans (Allen et al., 2013).

In the survey, we included three financial knowledge questions. The multiple choice questions, along with the percent answering each choice, are presented in Table C2. The first question addressed compound interest, which is one of the key benefits of saving early for

retirement. Eight-three percent of the sample answered that question correctly. The second question concerned inflation. Inflation risk plays an important role when considering the risk of outliving one's resources in retirement. We find that only 81 percent of the sample understood that if savings grow by 1 percent while inflation is 2 percent, spending power will decrease. Finally, the third question addressed the tax-preferred status of optional retirement saving plans by asking how a pre-tax contribution reduces take-home pay. Only 33 percent of the sample answered this question correctly, while 32 percent reported that they did not know and 17 percent answered incorrectly.

The bottom of Table 4 presents the estimated coefficients on the financial literacy questions. Interestingly, we find that answering correctly on the inflation question is associated with a 10 percentage point and 5.4 percentage point increased probability of subjective and objective planning, respectively. The other two financial knowledge variables are not significantly related to our measures of planning. While we find a strong association between the understanding of inflation risk and the propensity to plan for retirement, we cannot determine whether financial literacy causes planning or whether individuals obtain financial knowledge while planning for retirement. Still, this finding is consistent with the growing literature that suggests improving financial knowledge is an important component of ensuring retirement income security.

V.   Retirement Preparedness

There are many aspects of retirement planning. Thus far, our primary focus has been on examining the determinants of two measures of planning. First, we have used the survey responses to determine whether the respondents have developed retirement plans. Second, we have examined the utilization of retirement planning tools provided by the retirement system. We

now consider several additional dimensions of planning along with outcomes from the planning process.   First, within the context of a lifecycle model, the planned retirement age influences consumption and saving decisions throughout the working life. Individuals seeking to retire at younger ages must save more while working and should be more likely to participate in supplemental retirement saving plans. Second, when retiring from a career job, one may not permanently and completely leave the labor force. Retirement from a career job substantially alters employment opportunities and compensation, but does not necessarily imply an individual is not earning any labor income. Rather, individuals can shift from full-time employment on a career job to full or part-time employment on a bridge job (including self-employment) or enter into phased retirement. Thus, work after retirement can be an important component of retirement planning.

Analysis of the planning process yields two testable hypotheses. First, if planners expect to retire at younger ages, they will need to save more and thus need higher wealth near retirement. A central component of retirement planning is saving for retirement. Greater annual saving should produce higher retirement wealth as workers approach the planned retirement age. As described in Section III, Table 1 provides a distribution of wealth separately by planning category and clearly indicates the difference in retirement saving for these individuals. Among non-planners (the latter two categories in Table 1), 32 percent of planners have wealth of $250,000 or more, which is much higher than the fraction of non-planners with this level of accumulated wealth. As we described earlier, this link between planning and wealth is consistent with findings from previous studies.

Second, are planners more likely to plan to retire at younger ages from their career job? In order to accumulate sufficient resources for an earlier retirement, workers would need to

develop a plan for saving that would allow them to accumulate more assets to provide the resources needed for extra years of retirement. Table 5 shows that individuals aged 50 to 59 who indicated that they had developed a retirement plan had a planned retirement age of 61.32, which is 1.3 years younger than the planned retirement age for non-planners. Older planners (those 60 to 69) also had a younger retirement age compared to non-planners in the same age category. Less than one-third of planners aged 50 to 59 expected to work beyond age 65. In comparison, 41 percent of the younger non-planners reported a planned retirement age of 65 and older.

[Table 5]

Finally, it is interesting to explore whether planners are more likely to include work after retirement into their retirement plans. Little is known about how public sector workers view retirement, particularly as strong incentives may "push" older workers out of their career jobs or out the labor force entirely (e.g., Costrell and Podgurksy, 2009). Individuals who have developed a retirement plan may be more likely to engage in activities that increase the odds of finding suitable employment in a bridge job. On the other hand, individuals who have failed to plan may recognize toward the end of their career that they have saved too little and must consider working in retirement as a means of enhancing their living standard in retirement. In Table 6, we report the proportion of planners and non-planners who reported their plans regarding working after retirement. Planners are 6 percentage points more likely to report that they do not anticipate working after retirement compared to non-planners, 30 percent compared to 24 percent. Among those who plan to work after retirement, there is little difference between planners and non-planners on whether they anticipate working full or part-time and whether these post-retirement jobs will be in the same or different type of work.

[Table 6]

VI.   Conclusion

The literature on retirement savings decisions has shown that retirement planning plays an important role in a successful transition from work to complete retirement. However, the data used in previous studies do not allow a full investigation of the factors that are associated with retirement planning behavior. Using a data set that combines administrative records with a large-scale survey, we explore what factors are associated with both objective and subjective measures of planning for retirement among public sector workers in North Carolina.

We find an important role for individuals' preferences towards time discounting in their subjectively measured propensity to plan, whereby those who choose the more "patient" option were also more likely to report having made a retirement plan. We also find that individuals who correctly answered the financial knowledge question regarding inflation were significantly more likely to be classified as a planner using both our subjective and objective measures. We observe that planning is associated with higher rates of wealth accumulation and higher rates of participation in supplemental retirement saving plans. We also find that planners are more likely to report plans to retire completely, rather than reenter the labor market after retiring from their North Carolina public sector employer. Similarly, planners report planning to retire at younger ages.

When considering how to best ensure retirement income security for individuals, employers and policymakers choose a combination of policies that impose savings and annuitization (i.e., Social Security and DB pension) and those that require an individual to take responsibility and plan (e.g., supplemental retirement saving plans). Choices made at retirement are often irreversible and can have long-term implications for retirement income security. In this paper, we show an important role of planning, measured both subjectively and objectively, in

wealth accumulation and retirement preparedness. We find that only about half of the sample has made a retirement plan, despite the fact that our sample includes only older workers (ages 50-69).

In future work, we plan to extend the analysis of planning behavior, moving beyond the planner versus non-planner delineation to incorporate additional nuances of behavior as an individual plans for retirement. Binswanger and Carman (2012) show that planners can be segmented into those individuals who engage in formal planning versus those who follow simple rules of thumb. For those in the latter group, a plan may consist of a saving a fixed percentage of earnings each month, without a full analysis of retirement needs or optimal strategies to achieve these needs. The richness of our data allows us to make advances in this direction, building on the work of Binswanger and Carman.

By broadening our understanding of the characteristics that differentiate planners from non-planners, our empirical results suggest directions for targeted retirement planning campaigns, which employers or policymakers could conduct. Using the insights from our findings on planning behavior, we are currently designing a field experiment to understand the determinants of participation in supplement retirement saving plans. Together with the results of the present paper, determining what types of workers are on the margin of the supplemental plan participation decision provides insights into the role for policies going forward to ensure a secure retirement for the population at large and for public sector workers in particular. Future work will also include a survey of individuals who have recently retired and a two-year follow-up with respondents in our current sample to track the evolution of retirement plans (see Appendix D).

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Table 1: Measures of Planning

	Self-reported Subjective Planning			Objective Measure of Planning		
	Have a plan	Have thought about it	Have not thought about it	Requested self service estimate	Logged in to orbit	Have not logged in
N	1094	880	274	1,213	316	719
Salary	$57,131	$48,905	$42,785	$57,972	$47,243	$44,523
Lottery: patient	52.38%	40.68%	37.59%	49.05%	45.89%	40.89%
Benefit: patient	38.03%	29.55%	28.83%	34.13%	35.13%	31.99%
Risk aversion	66.73%	63.41%	68.61%	66.20%	66.14%	64.53%
Financial literacy: 2 of 3	47.90%	45.80%	41.24%	46.58%	47.15%	45.34%
Financial literacy: 3 of 3	34.92%	26.48%	18.25%	34.30%	26.27%	23.09%
Years of service	17.56	16.28	15.06	19.05	14.28	13.96
Formal source of financial information	77.24%	60.68%	43.07%	69.74%	67.41%	60.92%
Informal source of financial information	13.89%	21.48%	21.90%	16.74%	17.09%	20.03%
No source of financial information	8.23%	16.59%	33.21%	13.03%	14.56%	17.11%
Participate in NC401K/457 (Admin)	48.45%	38.98%	38.69%	45.67%	42.72%	40.33%
Participate in any Supplemental Retirement Plan (Survey)	77.61%	64.55%	62.77%	70.82%	75.00%	68.57%
Wealth: less than 25,000	13.62%	36.25%	45.26%	21.76%	25.00%	34.63%
Wealth: 25,000 to 99,999	21.48%	26.48%	22.63%	23.41%	23.73%	23.78%
Wealth: 100,000 to 249,999	20.93%	11.93%	7.30%	18.38%	16.77%	10.85%
Wealth: 250,000 to 499,999	14.81%	7.73%	2.19%	12.45%	10.76%	7.09%
Wealth: 500,000 to 999,999	12.71%	2.39%	0.36%	9.32%	7.59%	3.34%
Wealth: 1 million or more	4.75%	0.80%	0.73%	3.38%	3.48%	1.25%
Wealth: Do not know	6.12%	10.23%	16.42%	6.68%	7.91%	13.35%

Table 2: Measures of Planning

	Self-reported Subjective Planning			Objective Measure of Planning		
	Have a plan	Have thought about it	Have not thought about it	Requested self service estimate	Logged in to orbit	Have not logged in
N	1094	880	274	1,213	316	719
Expect to have enough money throughout retirement:						
- Agree	71.21%	35.80%	26.28%	58.70%	50.95%	40.75%
- Neither agree nor disagree	15.27%	22.05%	20.07%	17.72%	19.94%	19.19%
- Disagree	8.78%	31.14%	36.86%	16.65%	20.57%	28.37%
- Don't Know	4.02%	10.68%	14.96%	6.43%	7.59%	10.71%
Expect to have enough money for medical expenses:						
- Agree	53.75%	28.98%	22.26%	46.00%	41.77%	29.76%
- Neither agree nor disagree	23.77%	25.57%	20.80%	24.98%	25.00%	22.25%
- Disagree	12.34%	32.73%	39.05%	18.55%	23.73%	31.99%
- Don't Know	9.14%	11.93%	16.06%	9.89%	8.23%	14.33%
Saving the right amount for retirement						
- Agree	51.19%	13.41%	12.41%	37.18%	33.86%	21.42%
- Neither agree nor disagree	27.33%	27.73%	18.25%	28.11%	28.16%	22.67%
- Disagree	15.81%	48.64%	50.36%	26.55%	28.80%	45.34%
- Don't Know	3.84%	9.32%	16.42%	7.01%	6.96%	8.62%
Will choose the best way to use savings during retirement						
- Agree	88.30%	73.98%	58.76%	83.59%	79.75%	71.21%
- Neither agree nor disagree	8.23%	15.91%	19.34%	11.05%	10.13%	16.27%
- Disagree	0.91%	4.09%	7.30%	1.98%	3.80%	4.17%
- Don't Know	1.46%	5.68%	11.68%	2.97%	4.75%	6.54%

Table 3: Objective planning by subjective planning cross tabulation

	Requested self service estimate	Logged in to orbit	Have not logged in	Total
Have a plan	697	152	245	1,094
	31.01%	6.76%	10.9%	48.67%
Have thought about it	427	124	329	880
	18.99%	5.52%	14.64%	39.15%
Have not thought about it	89	40	145	274
	3.96%	1.78%	6.45%	12.19%
Total	1,213	316	719	2,248
	53.96%	14.06%	31.98%	100%

Table 4: Regression estimates of who is planning

	Self-Reported Planning	Objective Planning (Self-Service)
Age	-0.043	0.024
	(0.050)	(0.045)
Age^2	0.000	-0.000
	(0.000)	(0.000)
Years of service	-0.005	0.028***
	(0.004)	(0.004)
Years of service^2	0.000	-0.001***
	(0.000)	(0.000)
Salary (10k)	0.019***	0.013**
	(0.005)	(0.005)
Male	-0.031	-0.019
	(0.023)	(0.020)
College degree	0.042	-0.011
	(0.026)	(0.023)
White	0.018	0.079***
	(0.026)	(0.023)
Married	0.094***	0.012
	(0.023)	(0.020)
Own home	0.121***	0.000
	(0.031)	(0.028)
Sample receiving print survey	-0.151***	-0.478***
	(0.025)	(0.023)
Teacher	0.004	-0.005
	(0.025)	(0.023)
University Employee	-0.075*	-0.019
	(0.031)	(0.028)
Patient: lottery frame	0.076***	0.011
	(0.022)	(0.020)
Patient: benefit frame	0.065**	0.014
	(0.022)	(0.020)
Risk averse	0.035	0.017
	(0.026)	(0.024)
Financial literacy : compound interest	0.036	0.004
	(0.030)	(0.027)
Financial literacy: inflation	0.100***	0.054*
	(0.029)	(0.026)
Financial literacy: tax advantage	0.001	0.025
	(0.023)	(0.021)
Mean	0.487	0.539
N	2,248	2,248

Notes: Dependent variables are self-reported planning (Col 1) and objective planning (Col 2). See Table 1 for a description of the variables. Coefficients are estimated using a linear probability model. Standard errors are in parentheses. * $p<0.05$, ** $p<0.01$, *** $p<0.001$. Specifications also include dummy variables for blank and/or don't know for risk, patience (lottery and benefit frames), race, education, home ownership, salary, and occupation.

Table 5: Retirement Preparedness

	Age 50-59		Age 60-69	
	Planner	Not Planner	Planner	Not Planner
N	686	832	339	236
Planned age of retirement (mean)	61.32	62.62	65.61	66.20
Planned age of retirement <62	46%	34%	6%	1%
Planned age of retirement 62-64	24%	25%	28%	22%
Planned age of retirement 65-67	25%	31%	43%	51%
Planned age of retirement 68+	5%	10%	23%	26%

Note: This table includes the 2,093 respondents that had a valid response to the question:
At about what age do you plan to retire (in other words, stop working full-time for your current employer and begin receiving retirement benefits)?

Table 6: Planning and Preparedness

	Planner	Not planner
Once you terminate your job as a government employee, which of the following do you plan to do?		
Completely retire and not work at all	30.1%	24.0%
Return to work for my current employer as a contractor	3.8%	3.2%
Leave my current job, but work full-time doing similar work	3.4%	4.2%
Leave my current job, but work full-time doing different work	3.7%	4.7%
Leave my current job, but work part-time doing similar work	27.2%	28.0%
Leave my current job, but work part-time doing different work	30.8%	33.7%
Blank	1.1%	2.3%
N	1,094	1,154

Note: N= 2,248.

Appendix A. Description of North Carolina's Pension System

North Carolina is the tenth most populous state in the nation. Public employees live and work in geographically diverse regions across the state, including both rural and urban areas. Appendix Table A1 uses data from the 2007-2011 American Community Survey to illustrate the diversity of North Carolina's population, which is reasonably representative of the U.S. population. Notable exceptions to this representativeness include a comparatively small Hispanic population, comprising only eight percent (8%) of the total population, as well as a comparatively large population of non-Hispanic blacks, comprising twenty-one percent (21%) of the population.

Most full-time state employees in North Carolina are covered by the Teachers' and State Employees' Retirement System (TSERS), while most full-time local employees are covered by the Local Governmental Employees' Retirement System (LGERS). Both of these plans are defined benefit pension plans, and they have very similar plan characteristics. In addition to these plans, North Carolina also has separate defined benefit plans for members of the General Assembly (the Legislative Retirement System), for firefighters and rescue squad workers (the Firefighters' and Rescue Squad Workers' Pension Fund), and for the state's judicial system employees (the Consolidated Judicial Retirement System). Faculty members, administrators, or other eligible employees at state institutions of higher education, eligible employees of the UNC Health Care system, and community college presidents may elect to participate in a deferred compensation plan known as the Optional Retirement Program (ORP) in lieu of TSERS. ORP participants are not included in this study.

TSERS covers virtually all permanent employees employed at a state agency in North Carolina and virtually all permanent, full-time teachers and employees of local public school districts, local public boards of education, and community colleges who work 30 or more hours

per week for nine or more months per year. LGERS covers workers who are regularly employed by a participating local governmental employer in a position requiring 1,000 or more hours of work in a given 12-month period. Any municipal, county, or other local governmental unit may elect to participate in LGERS. Appendix Table A2 lists the major characteristics of these two plans, including the plans' benefits, retirement age and service requirements, and the plans' funding sources (e.g., employer and employee contribution rates).

In addition to their respective primary defined benefit plans, state and local governmental employees may also choose to enroll in the state-managed NC 401(k) and NC 457 plans, provided their employer has elected to offer them.[12] With the exception of law enforcement officers, the state does not provide any employer match, nor has it adopted an automatic enrollment policy. Some local employers, however, choose to provide matching contributions. The North Carolina Retirement Systems Division (RSD) incorporates supplemental retirement plan information into the annual benefit statement provided to all state and local governmental employees, allowing workers to assess their projected retirement income in a more comprehensive manner. Upon retirement, individuals have the option of transferring funds from their supplemental retirement accounts to receive an additional monthly pension benefit from the retirement system.

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[12] Details of the supplemental plans can be found at the following two websites: https://www.retirement.prudential.com/cws/ncplans/ and http://www.doc.state.nc.us/docper/benefits/457-401k-chart.pdf. A state-managed 403(b) plan for employees of school districts is being implemented this fall. See www.nctreasurer.com/Retirement-and-Savings/Managing-My-Retirement/Pages/NC-403b-Program.aspx for more information.

Appendix Table A1. Representativeness of North Carolina: Statistics from the American Community Survey

	North Carolina	United States
Total Population	9,418,736	306,603,772
Median Age	37.3	37.0
Percent Age 65 years and older	12.8%	12.9%
Percent Female	51.3%	50.8%
Percent Non-Hispanic White	65.7%	64.2%
Percent Non-Hispanic Black	21.2%	12.2%
Percent Hispanic or Latino	8.1%	16.1%
Percent Bachelor's Degree or Higher, (persons age 25+)	26.5%	28.2%
Percent High School Degree or Higher, (persons age 25+)	84.1%	85.4%
Unemployment Rate	9.7%	8.7%
Government Worker	15.3%	14.9%
Median household annual income	$46,291	$52,762
Per capita annual income	$25,256	$27,915

Source: U.S. Census Bureau, 2007-2011 American Community Survey.

Appendix Table A2. Characteristics of TSERS and LGERS

Plan Characteristic	TSERS / LGERS
Vesting	5 years
Benefit formula	TSERS: 1.82% per year of service times FAS LGERS: 1.85% per year of service times FAS
FAS	Average salary for 48 highest consecutive months
Criteria for unreduced benefit	Age 65 and complete five years of creditable service Age 60 and complete 25 years of creditable service 30 years of creditable service at any age
Criteria for early retirement (benefits are reduced)	Age 50 and 20 years of creditable service Age 60 and five years of creditable service
Lump sum payment option	Yes
Annuity options	6 options
Employee contribution	6% of salary
Administration of Plan	Department of the State Treasurer, Retirement Systems Division

Details of TSERS can be found at
https://www.nctreasurer.com/ret/Benefits%20Handbooks/2013TSERShandbook.pdf

Details of LGERS can be found at
https://www.nctreasurer.com/ret/Benefits%20Handbooks/2013LGERShandbook.pdf

Appendix A3. ORBIT Self-Service Website

North Carolina ORBIT — Online Retirement Benefits through Integrated Technology

North Carolina Department of State Treasurer

Janet Cowell, State Treasurer

| **Active Employee** | Forms | Educate Yourself | Contact Us |

Welcome

View Personal Information

View Account Summary

View Account History

View Annual Benefits Statements

View Benefit Estimate

Create Custom Benefit Estimate

View 401K/457 Transfer Benefit Estimate

Maintain Phone/Email

Sign up for Retirement emails

Request Account Balance Statement

Create Service Purchase Estimate

Track Recent Request

Request Appointment

Logout

> *Welcome to ORBIT*

Welcome to ORBIT

A message from State Treasurer Janet Cowell:

Dear Fictitious,

Welcome to ORBIT. This online tool provides you with full, secure access to your personal retirement account information 24 hours a day.

The Department of State Treasurer is committed to providing you with information that will help you make informed decisions about your future. I encourage you to familiarize yourself with your account information, understand your savings options, and utilize the education and planning resources available on our website. Please contact the North Carolina Retirement Systems at 1-877-NCSECURE (1-877-627-3287) if you have additional questions.

Thank you for your service to North Carolina.

-Janet Cowell

View Personal Information

This section allows you to view your personal information on file with the Retirement Systems Division.

View Account History

This section allows you to view a historical summary of your service, salary, and contributions.

View Benefit Estimate

This section allows you to view current estimates of your benefits.

Maintain Phone/Email

This section allows you to update your phone numbers and email address.

Request Account Balance Statement

This section allows you to create a service purchase estimate of potential cost.

Track Recent Request

This section allows you to request an appointment.

View Account Summary

This section allows you to change and/or view your beneficiary designations and view a summary of your service accrued to date.

View Annual Benefits Statements

This section allows you to view your annual benefits statements.

Create Custom Benefit Estimate

This section allows you to create a customized estimate of your benefits.

Sign up for Retirement emails

This section allows you to Sign up for Retirement emails.

Create Service Purchase Estimate

This section allows you to view the status of recent transactions.

Request Appointment

Click here to view a printer friendly version of this page for your records.

Privacy Policy | Online Security

Appendix A4. ORBIT Self-Service Estimate Page

Appendix B: Data set construction

RSD provided administrative data covering local and state government workers who contributed (or had a contribution made by their employer on their behalf) to TSERS or LGERS for a pay period ending on or after 12/1/2013. Additionally, workers had to be aged 50 to 85 (we further restricted the sample to be younger than age 70), first hired before 3/4/2014, not retired from TSERS or LGERS as of March 2014, and not on long-term disability at any point prior to 2/2/2014. After dropping observations with unidentified gender or salary and the 200 observations that were part of a pilot, we drew a sample of 15,000 state and local employees from these data.

The data included email addresses for about 60% of the sample. Thus, we drew a sample of 9,000 employees with email addresses and 6,000 employees without. Those with email addresses were sent a link to an online survey, while those without email addresses were sent a print version of the survey with a self-addressed, stamped envelope. To make sure the data collected were representative of the population at large, we stratified on four variables: gender (female or male), age (50-54, 55-59, 60-64, or 65-69), income (low, medium, or high), and retirement system (TSERS or LGERS). The sample consists of 48 strata proportional to the relative size of the strata in the data. As an incentive to complete the survey, we advertised that participants could enter into a drawing to win a free iPad.

While we retained all partial responses, the final data set only includes individuals who completed up through the portion of the survey on financial literacy (nearly 90% of the survey). Using this criterion, the response rates were 25% for the email sample and 9% for the print sample. Appendix Table B1 illustrates the response rates, and Appendix Table B2 describes the construction of the data set used for the analyses.

Table B1: Response Rates

	Sent	Delivered	Refused	Completed	Partially Completed	Response rate (4+5)/2
	(1)	(2)	(3)	(4)	(5)	(6)
Email	9,012	8,430	7	1,734	341	24.6%
Print	5,988	5,899	5	514	33	9.3%
Total	**15,000**	**14,329**	**12**	**2,248**	**374**	**18.3%**

Table B2. Data set construction

	Full	Survey
Full admin data	157,284	
Full Survey		2,622
Merged survey		2,622
Dropped aged 70+	154,786	2,622
Actively employed in March 2014 (admin)	150,295	2,618
Valid gender	150,204	2,618
Valid salary in 2013	146,550	2,599

Table B3: Comparison of key variables across population and survey responses

	Population	Responses	Email	Print
	(1)	(2)	(3)	(4)
Admin data:				
N	146,550	2,599	2,060	539
Gender (%male)	35.98	30.55	29.03	36.36
Age:				
Mean	56.76	57.17	57.29	56.67
50-54.99 (%)	40.74	36.78	35.73	40.82
55-59.99 (%)	34.67	35.71	35.68	35.81
60-64.99 (%)	19.55	21.97	22.48	20.04
65+ (%)	5.03	5.54	6.12	3.34
Salary:				
Mean	$46,372	$52,034	$55,134	$40,183
Less than $30,000 (%)	25.42	15.51	10.53	34.51
$30,000 to $49,999 (%)	38.84	37.32	36.80	39.33
$50,000 to $74,999 (%)	26.58	33.40	36.75	20.59
$75,000 to $99,999(%)	6.25	9.31	10.68	4.08
$100,000 to $149,999 (%)	2.21	3.92	4.66	1.11
$150,000 and above (%)	0.70	0.54	0.58	0.37
Survey data:				
N		2,057	1,587	470
Salary		$52,680	$55,788	$42,187
N		937	709	228
Spouse salary		$56,556	$59,097	$48,657
N		1,953	1,524	429
Household Income		$89,536	$94,372	$72,355

Note: Salary is measured in the administrative records and is not bottom coded; 2,199 observations are under USD 10,000.

Table B4: Summary Statistics

	Mean
Age	57.21
Male	0.32
Salary	$52,162.23
College degree or more	0.62
White	0.77
Race/ethnicity blank	0.01
Married	0.69
Own home	0.85
Home ownership blank	0.01
Annual DB benefit	$20,791.32
DB benefit: missing info	0.02
Print sample	0.23
Teacher	0.29
Police	0.04
University Employee	0.14
Occupation: blank	0.01

Notes: N = 2,248. Data are from a survey of North Carolina public sector workers ages 50-69 merged with administrative records from the North Carolina Retirement Systems Division.

Appendix C: Time, Risk, and Financial Literacy Questions

Table C1: Survey Questions on Time and Risk Preferences

Survey Question	Answers (%)

Time Preference

Suppose that you won a prize that is worth $1,000 if you take it today. Alternatively, you could wait one year to claim the prize and be guaranteed to receive $1,200. Would you claim the $1,000 dollars today, or would you wait one year for $1,200?

a) Claim $1000 today	45.11
b) Wait one year and claim $1200	46.00
c) Do not know	7.07
Blank	1.82

Imagine you are 65 years old, and you currently receive $1,000 per month in Social Security benefits. Suppose you were given the choice to lower that benefit by half, to $500 per month. This one-half benefit reduction would continue for as long as you live. In return, you would be given a one-time, lump-sum payment of $80,500. Would you take the $1,000 monthly benefit for life, or the lower monthly benefit combined with the lump sum payment?

a) Take the $1000 monthly benefit	33.59
b) Take the lower benefit and the lump sum	48.18
c) Do not know	15.97
Blank	2.27

Risk Preference

Suppose that you are the only income earner in the family. Your doctor recommends that you move because of allergies, and you have to choose between two possible jobs. The first would guarantee you an annual income for life that is equal to your current income. The second is possibly better paying, but the income is also less certain. There is a 50-50 chance the second job would double your income and a 50-50 chance that it would cut your income by 20%. Would you take the first job or the second job?

a) First job	65.66
b) Second job	18.82
c) Do not know	13.17
Blank	2.36

N=2,248

Table C2: Financial Literacy Questions

Survey Question	Answers (%)
Compound Interest	
If you have $100 in your savings account and the annual interest rate is 2%, how much money will you have in your account after 5 years?	
a) **More than $102**	**83.05**
b) $102	4.49
c) Less than $102	3.87
d) Do not know	6.67
Blank	1.91
Inflation	
If the current interest rate on your bank deposit is 1% per year and the inflation rate is 2% per year, how much do you think you will be able to buy with your money a year from now?	
a) A larger amount than you can buy now	1.96
b) Exactly the same as you can buy now	3.74
c) **A smaller amount than you can buy now**	**80.74**
d) Do not know	11.17
Blank	2.40
Tax Advantage	
Assume you are in the 25% tax bracket (you pay $0.25 in tax for each additional dollar earned) and you contribute $100 more pre-tax to a retirement saving plan (e.g., 401(k), 403(b), 457(b), IRA). Your take-home pay (what is in your paycheck after all taxes and other payments are taken out) will:	
a) Decline by $100	17.48
b) **Decline by $75**	**33.05**
c) Decline by $50	4.85
d) Remain the same	8.99
e) Do not know	31.54
Blank	4.09

N=2,248

Appendix D: Summary of Project

This study uses data collected through a large project entitled "Work Life Transitions by Older Public Employees," funded by the Sloan Foundation. The research is based on a partnership between the Poole College of Management, North Carolina State University and the Retirement Systems Division (RSD) of the North Carolina Department of State Treasurer. The project includes a series of surveys of active public employees aged 50 and older and recent retirees, an analysis of RSD's administrative records, and a field experiment. A summary of each data collection effort follows.

Research Activity 1: Survey 1

Completed July 2014; Active employees ages 50-69

Survey 1 includes questions on demographics, health/health insurance, household income/labor supply, retirement plans, financial literacy, wealth accumulation and participation in supplemental plans, and risk and time preferences. The survey also contains a section on plans to work after retirement.

Research Activity 2: Nudge

Randomized Marketing Campaign for Supplemental Plans

Target Date October 2014 (in conjunction with National Save for Retirement Week); Active employees ages 50-69, currently contributing but at a low level and those not currently contributing. Sample includes only those working at state agencies, which are only able to offer employees the NC 401(k) and/or NC 457 state-managed plans.

We are currently developing several versions of a flyer aimed at encouraging participation in the supplemental plans. The flyer will be distributed to a randomized subset of workers and participation and contribution rates will be tracked for several months.

Research Activity 3: Survey 2

Target date for Survey 2 to be sent: February 2015

Target population: Employees who began receiving retirement benefits between January 2010 – December 2014

Survey 2 will include questions similar to Survey 1 (demographics, health/health insurance, household income/labor supply, financial literacy, wealth accumulation and participation in supplemental plans, risk and time preferences). In addition, Survey 2 focuses on choice of annuity and work after retirement.

Research Activity 4: Survey 3

Target date for Survey 3 to be sent: March 2016

Target population: All respondents from Survey 1

Survey 3 will measure how retirement plans evolve over time (2 year period).

Administrative Records

Through a data-sharing agreement, RSD is sharing with NCSU administrative records on older workers and retirees.