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Keywords: Older adults, low income retirees, moderate income retirees, retirement savings, public employees, North Carolina, financial literacy

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The ability of retirees to manage their assets and debts influences their income security and well-being during retirement. This may be especially true for low-income households who can quickly exhaust their assets if they manage their portfolios poorly or if they have not saved adequately for retirement. This chapter examines how recent retirees from public sector agencies in North Carolina access and utilize their retirement savings. All of these retirees have a base retirement benefit from a defined benefit (DB) pension and from social security, and many have contributed to the employer-provided retirement saving plans offered by the state. We examine important financial actions and assess the role of financial literacy on asset management and financial distress with a focus on households in the bottom half of the income distribution for these retirees.[1] If lower income households have lower levels of financial literacy, then disparities in financial wellness in retirement may stem both from inadequate savings while working and from poor asset management in retirement.[2]

The primary goal of the chapter is to enhance our understanding of how low-income retirees manage and utilize their retirement savings in the drawdown phase of life. We address the following four interrelated factors shaping low-income retirees' well-being:

(1)   What is the extent of financial distress among public retirees and how does this vary by gender and marital status?

(2)   Do retirees make systematic errors when they manage their assets so as to maintain their standards of living, and do we observe differences in financial management skills across subgroups?

(3)   Are higher levels of financial literacy associated with lower rates of committing such errors and thus, greater well-being in retirement?

(4)   Do low-income households have lower levels of financial literacy and as a result, are they more apt to make poor financial decisions?

This analysis of retiree asset and debt management examines the behavior of households receiving monthly payments from a relatively generous DB pension plan. The retirement and health plans provided to public employees in North Carolina are similar to those of other states, though in the US, public employees are much more likely to be covered by these benefits than individuals who spent their careers working for private sector firms (Munnell et al. 2011; Copeland 2014). Moreover, the households we study have a significant portion of their overall wealth annuitized in the form of monthly benefits paid by their pension plan and social security. In addition, many of these retirees are also able to remain in the state health plan throughout their retirement. For these reasons, these households have greater income security in retirement and should be better able to achieve their desired standard of living in retirement compared to many American retirees. Even so, the retirees must decide how to best utilize funds from supplemental retirement saving plans and other assets, and how well they do so will influence their retirement well-being. In our empirical work, we find low levels of financial literacy, and strong links between low financial literacy and making errors in financial management. Our findings suggest avenues for interventions to improve the well-being of retirees through increasing retirees' financial knowledge and understanding.

In what follows, we briefly review the literature relating to financial fragility and economic distress facing low-income retirees. Next, we describe the data employed in the analysis and summarize descriptive statistics on the retirees' income and wealth. The following section analyzes how retirees' levels of income are affected by individual and household characteristics. This is followed by an examination of the factors associated with asset and debt management, the role of

financial literacy, and how higher levels of literacy affect financial decisions. A last section concludes.

Financial Management and Economic Distress of Retirees

There is a substantial literature analyzing why many people make poor financial choices during their working years. Such financial management mistakes have an impact on retirement income security for several reasons. First, individuals might fail to save adequately and accumulate sufficient wealth for retirement, and thus they may lack resources to consume at desired levels in retirement. Second, debt accrued during working years will continue to be repaid in retirement, decreasing retirees' disposable incomes. Third, retirees might continue poor fiscal habits of earlier years such as over-spending and high-cost borrowing. Differences in financial fragility in retirement therefore can arise as a result of low levels of asset accumulation levels, low income, and low levels of financial knowledge.

Wealth drawdown in employer-provided retirement plans. Over the past few decades, there has been a steady shift from DB pensions towards defined contribution (DC) plans throughout the economy. The growing popularity of DC plans provides households more control over income streams and offers alternative paths for the drawdown of wealth. While increasing choice, households face the risk of spending their assets too fast and as a result may outlive their wealth (Gale et al. 2008; Iwry and Turner 2009). Thus, the flexibility of personal retirement accounts can result in suboptimal withdrawal patterns and financial insecurity in retirement, even among those that do participate in voluntary retirement saving plans.

There is mixed evidence on how the balance in personal retirement accounts has evolved in recent years (Love and Smith 2007; Smith et al. 2009; Poterba et al. 2013), but studies generally

find a skewed distribution of account balances and concentration of wealth at the top of the distribution. Poterba et al. (2011) show that the average personal retirement account balance in 2010 was $121,137, yet 50 percent of households had a balance of less than $5,000. Past research has also found that fewer than one-third of households withdraw from their saving accounts before age 70 (Bershadker and Smith 2005; Poterba et al. 2013). Conditional on withdrawing, the proportion of account balance withdrawn is small, which contributes to growing average retirement account balances even to the age of 85 (Poterba et al. 2013).[3]

Debt holding among the elderly. Debt holding among American households is at a historical high and much of the increase is related to significant growth in debt held by older Americans.[4] Older households today have significantly larger aggregate debt balances, and are more leveraged than prior generations (J. Brown et al. 2020; M. Brown et al., 2020; Copeland 2013; Lusardi et al. 2020). Such debt could potentially offset the asset accumulation of elderly households and lead to financial fragility, especially among low-income families. Lusardi et al. (2020) show that low-income households were more likely to evaluate their debt position as holding too much debt, which is consistent with the fact that low-income households are found to have experienced a surge in financial fragility. The share with high debt burdens (debt payments higher than 40% of income) rose more rapidly among low-income families than other income groups in recent years (Anguelov and Tamborini 2010; Copeland 2013).

Credit card debt stands out in this context due to its associated high interest rate and increasing prevalence among elder households in recent years (Draut and McGhee 2004; Copeland 2013; Jiang and Dunn 2013).[5] In contrast, payoff rates have been falling, putting pressure on households' liquid assets (Jiang and Dunn 2013; Lusardi et al. 2020). Despite increased usage of credit cards, elderly individuals are shown to have the least knowledge among all age groups of

interest rate compounding (Lusardi and Tufano 2015). This suggests that some households may engage in suboptimal decisions to hold credit card debt, which bears serious financial consequences such as higher likelihood of filing for bankruptcy (Domowitz and Sartain 1999; Gross and Souleles 2002). In this sense, credit card debt can be viewed as not only an indicator of short-term financial difficulty, but also a source of long-term financial distress.

The prevalence of debt among the elderly, coupled with limited withdrawal of personal retirement savings accounts reported in the previous section, leads us to ask whether households are making financial mistakes by holding high-interest debt, such as credit card debt, while not accessing their assets in retirement accounts.

The role of financial literacy. Financial literacy has been shown to have a clear inverse association with excessive debt holding. For instance, people with lower financial literacy levels have a greater share of high-cost debt in credit portfolios (Disney and Gathergood 2013; Gathergood 2012). Lusardi and Tufano (2015) also show that that lower levels of debt literacy are associated with a greater tendency to self-report having too much debt or being unsure about one's current debt position. The less financially literate are also more likely to report having paid finance fees or charges. Alarmingly, individuals age 65+ have the highest self-assessed financial knowledge across all age groups but they are least likely to answer correctly of two of the three debt literacy questions (Lusardi and Tufano 2015). The stark difference between subjective and objective measures of financial literacy for the older population indicates the possibility of households underestimating the costs and consequences of debt holding and thus making financial mistakes in retirement.

North Carolina State and Local Government Retirees

This study examines the well-being of retired public sector employees in North Carolina. We utilizes data from the North Carolina Retirement Transitions Study-Benefit Claimants (NCRTS-BC) drawn from two sources. First, we obtained administrative data files for all employees covered by the North Carolina Teachers' and State Employees' Retirement System (TSERS) and the Local Governmental Employees' Retirement System (LGERS) and who claimed pension benefits between 2009 and 2014.[6] From this universe of recent retirees, we extracted a stratified random sample who were sent two surveys developed by the authors and their colleagues in spring 2015 and spring 2017.[7] The information from the two surveys was merged with administrative records.

The administrative records contain detailed information on each retiree including earnings, job information, years of service, creditable service, year of retirement, annuity option chosen, and benefit amount. The surveys obtained additional personal information about race/ethnicity, education level, household income and wealth, work status after claiming retirement benefits and marital status, along with questions about their spouses of married retirees. In addition, the survey included questions on retiree debt holding and financial literacy. Throughout this study, we examine annual household income of retirees as reported in the 2017 survey.

Table 1 presents summary statistics for all individuals who retired from public employment in North Carolina between 2009 and 2014 (Column 1) and the 2017 survey (Column 2). A total of 72,350 individuals retired and claimed benefits from either TSERS or LGERS during this period. All values for the variables shown in Table 1 are from the administrative records. The 2015 survey was sent to 29,544 individuals; we received 6,362 useable responses for a survey response rate of approximately 22 percent. In 2017, we sent all 6,362 individuals who responded to the 2015 survey a second survey, and we received 3,557 responses for a response rate of 56 percent. Comparing

Columns 1 and 2, our survey sample appears reasonably representative: differences between the two groups include the fact that survey respondents had higher final average salary, greater net annual pension benefit amounts, and were more likely to have had 30+ years of service at retirement.

Table 1 here

It is important to note the composition of the information employed in this analysis. The basic unit of observation is an individual who retired from state and local employment in North Carolina between 2009 and 2014. The administrative records contain only information on retirees, and our surveys were sent to the retirees. The surveys, however, also asked about household income and wealth along with information about household characteristics including on the retiree's spouse (if any). Accordingly, we focus on household income, which includes earnings and retirement income of the spouse as well as the retiree. The presence of a spouse who also has income means that married retirees who have the same career earnings as single retirees are more likely to be in higher income brackets. Thus, in the following discussion, we examine household income separately for single and married retirees. We make no adjustment for household size when comparing the annual income of married and single retirees.

Household Income and Retiree Characteristics

In this section, we analyze the financial well-being of recent retirees and how these retirees access and utilize retirement savings. Many households report holding debt, and many of those holding debt also have liquid assets that could be used to pay off their debt. Some retirees are observed to be maintaining high interest credit card debt while leaving untouched funds in retirement saving plans paying lower annual returns. We document the incidence of this type of

behavior and estimate the household characteristics associated with these likely mistakes in wealth management. Throughout the analysis, we focus on households in the bottom half of the income distribution and assess the importance of financial literacy on wealth management. Results highlight the importance of both household income and supplemental retirement saving plan holdings in maintaining living standards in retirement. We observe debt holding even among those with high incomes and substantial retirement savings. This type of wealth management is an indication of potential systematic mistakes that reduce retiree welfare.

Distribution of retiree income. Survey respondents were asked to provide an estimate of their annual household income in broad ranges.[8] Over half (57%) indicated that they had an annual income of less than $75,000. A more detailed view of household income shows that 5 percent of these retirees reported that they had annual incomes below $25,000, while 25 percent reported income between $25,000 and $50,000. Another 28 percent indicated annual income of between $50,000 and $75,000. Thus, even among these individuals with access to annuitized retirement income from an employer pension and social security, many families have low income and may face retirement financial distress.

Household characteristics do vary across the income categories (see Online Appendix Table 1). The survey responses indicate that low-income retirees are much less likely to be married than wealthier households: only about 30 percent of households with annual incomes below $25,000 are married, compared to about 50 percent of those with incomes in the next income bracket. Households in the higher income brackets are much more likely to be married, as over 70 percent of households with incomes between $50,000 and $75,000, and 91 percent of households with $75,000+ are married. This reflects, in part, the fact that spouses typically contribute income to the household.

Consistent with the general pattern of public employees, two-thirds of the retirees are female, and women are overrepresented in the lower income households: the retiree was female in three quarters of the households with income under $50,000, while only 58 percent of retirees were female in households with annual incomes $75,000+. As one might expect, households with higher levels of education reported higher income. A larger proportion of retirees and their spouses reporting that they were in good health were in the higher income brackets. In sum, low-income households in our sample are primarily headed by unmarried women with relatively low levels of educational attainment.

These observations indicate that our analysis should assess household differences separately by retiree marital status and gender.[9] Examining the income distribution of our sample separately by marital status of retirees reveals considerable differences in economic status by marital status. The income of married households is considerably higher than reported incomes of single retirees, with only one in six married households reporting income of below $50,000, while 58 percent of single retirees fall in the lower two income brackets. In general, women are more likely to be single, and female retirees, whether married or not, are more likely to be in the lower income groups.

Retirement benefits for retired public employees. The annual pension benefit paid to North Carolina retirees is directly related to their employment history with the state and local governments. The benefit formula for TSERS is:

Benefit = 1.82 percent of average final earnings times years of service

The LGERS formula is slightly more generous and has a benefit of 1.85 percent per year of service. Thus retirees with higher career earnings and more years of service will have higher annual pension benefits. The average annual pension benefit for the entire sample is $23,680. Over three quarters

of retirees (78.4%) in our sample are covered by TSERS and have an average annual benefit of $23,198. The 21.6 percent of retirees covered by LGERS have slightly higher average annual benefits at $25,422.

The average annual pension benefit of all retirees in households with total annual incomes of less than $25,000 is $9,681, compared to benefits of $17,317 for those with incomes of $25,000 to $50,000, and $23,369 in the next income bracket. The proportion of retirees reporting that their spouses received a pension of their own in 2015 rises with household income (Online Appendix Table 2).

Public employees in North Carolina may contribute to retirement saving plans offered by their employers, and state and local employees can also make voluntary contributions to state-managed 401(k) and 457 plans. Throughout this chapter, we refer to both of these plans as the supplemental retirement plans (SRP) for public employees. While public school employees can contribute to 403(b) plans managed either by the local school district or the state, we only have administrative data on plans managed by the state retirement system. In comparison to many such plans in the private sector, SRPs for public employees in North Carolina do not include an employer match. Government agencies also do not automatically enroll their employees into SRPs.[10] Our survey contains information about all SRP plans in the household including those of the retiree's spouse.

Despite their low incomes, almost three quarters of retirees in the lowest income category have account balances in the SRP, and almost half of the retirees with SRP accounts report balances over $100,000.[11] The average imputed balance is $115,509 for this group.[12] This reflects a lifetime of employee contributions to the SRP by individuals with low annual earnings. These surprisingly large account balances highlight the fact that even low-income households must

manage their assets and debts efficiently. We also observe that the proportion of retirees with SRP accounts rises with household income, as does the average account balance. For example, 95.6 percent of households with income in excess of $75,000 reported having SRP accounts, and the average imputed balance was $366,416.[13] Additionally, the average pension benefit of married retirees is slightly higher than single retirees ($24,112 compared to $22,991), the average benefit within each income bracket is higher for single retirees. A higher proportion of married retirees has an SRP and the account balances for those with an SRPs are greater for the married retirees.

State and local employees often retire at relatively young ages, and as a result, many consider returning to work either with the government or in the private sector of the economy. Working after retirement may be driven by a need for additional income or because of a desire to remain active. And since work generates additional income, households where a retiree remains in the labor force are more likely to be in the higher income groups. Almost 30 percent of the retirees with household incomes below $25,000 were working at the time of the survey. This compares to about 41 percent of the retirees with household income of over $75,000. Work after retirement is an important source of income for many public sector retirees. Moreover, a higher proportion of low-income households had already claimed social security benefits than high-income households.

Single retirees are more likely to be working and more likely to be receiving social security benefits. An important distinction in the comparison of income by marital status is that over 40 percent of the spouses of married retirees are still working, and over half of the spouses are receiving social security benefits. In addition to higher proportions having SRPs, married retirees also have a much higher average household balance of SRP of $288,317, compared to an average balance of $159,162 among non-married retirees. Thus the presence of a spouse tends to increase household income and wealth, resulting in the higher measured level of well-being of married

retirees. The additional income from a spouse might also explain the gender gap in retirement income: 38.5 percent of male respondents report their spouse is working, while only 30.2 percent of female respondents do. The gender difference in spouse's employment status is even larger among low-income households.

Do Retired Public Employees Face Financial Distress?

Despite receiving monthly pension benefits, retired households may still face financial challenges and may be unable to meet their monthly living expenses. To explore some of the financial challenges facing these public retirees, we asked five questions about their ability to maintain their living standards without going into debt or depleting assets. When asked whether they had 'spent out of savings when spending exceeded income,' 41 percent of all households below $75,000 indicated that they had done so. Drawing down savings is not necessarily a sign of financial distress: instead, many households intend to save while working and draw on these assets in retirement. We do not include drawing down assets as an indicator of financial distress in subsequent analysis, but it is important to recognize that the continued use of savings will ultimately deplete these assets.

A problem confronting many American households is an inability to pay credit card bills on time so as to avoid extremely high interest charges on unpaid balances. In our sample, 10 percent of the lowest income households indicated that they had borrowed money from friends or family, while 16 percent indicated that they got behind on payments or did not pay all of their bills on time. Almost one third of households with incomes below $50,000 indicated that they kept a credit card balance when spending exceeded income.[14] In stark contrast is the fact that 73 percent of these retirees reported having assets in the SRP with a mean balance over $100,000. Not using

SRP funds to avoid high credit card fees would seem like a mistake in asset management, and it raises the question of whether those with higher levels of financial literacy are able to avoid making this type of financial error.

The ability to access funds when faced with a financial emergency is one measure of financial security. To address this concern, retirees were asked whether they could come up with $2,000 next month. One third of households with annual incomes below $25,000 stated that they could not, and an additional 21 percent of those with incomes from $25,000 to $50,000 also said they could not.[15] On each of these dimensions, low-income retirees were more likely to report a higher degree of financial distress.

These responses to our financial distress questions indicate the fragile economic state of many of these household as they fail to meet monthly expenses, which also points to another puzzle. If these households have funds in their SRP or other forms of wealth, why could they not use these funds to meet an unexpected bill of $2,000? It may be that some might not view their SRP savings as a liquid form of wealth that can be accessed in times of financial distress. Interestingly, the measures of financial distress for our sample are similar to those reported by Lusardi et al. (2020). Table 2 shows the incidence of financial distress separately for married retirees and single individuals. In general, the proportion of married retirees reporting difficulty along these dimensions is smaller than for non-married retirees, and men are less likely to experience financial distress than women on all five measures.

Table 2 here

To compare the high levels of financial distress and SRP balances, it is useful to define a measure of financial mistakes. Specifically, we define a financial mistake if a retiree had a positive SRP balance but kept card balances or got behind on payments when spending exceeded income.[16]

Similar to financial distress measures, high-income individuals are less likely to make such a financial mistake. This pattern still holds for both married and non-married subsamples, with married retirees significantly less likely to make financial mistakes. There is also a lower proportion of men making financial management errors compared to women.

Financial Literacy of Public Sector Retirees

Managing assets and debts in retirement is complex and requires an understanding of key financial concepts. In general, we would expect that individuals with greater understanding and knowledge of financial issues would make better decisions. Our surveys, therefore, asked retirees three questions to measure their financial literacy.[17] The objective of the questions was to determine if retirees understood the power of compound interest, the impact of inflation of purchasing power, and the value of diversification in wealth management. These questions, known as the 'Big Three,' have been used in numerous other studies to measure financial knowledge and to assess the importance of financial literacy in managing assets and debts (Lusardi and Mitchell 2017).[18] Our results show that a significantly higher percentage of individuals with higher annual income answered each of the questions correctly. On average, low-income households had 0.6 fewer correct answers, compared to household with annual income over $75,000. Of particular note, individuals with less than $50,000 in annual household income were 20 percentage points less likely to correctly answer the compounding question in both subsamples. The lack of understanding associated with compounding by this in low-income households may be related to their greater use of credit card debt to meet monthly expenses.

Having an understanding of the relationship of inflation and real purchasing power as well as the need to diversify, also influences basic financial management decisions. The concern is that

inadequate financial knowledge leads to bad financial decisions and ultimately lowers income, wealth, and living standards throughout retirement. If low-income households are not able to adequately save for retirement, or do not save as much due to poor financial literacy, then they arrive at retirement with less wealth. Poor financial literacy might also impede their ability to optimally drawn down whatever wealth they did accumulate. These households receive higher replacement rates from social security and have access to other social supports, so to the impact of financial mistakes make not be as great as similar mistakes made by higher income households. In our sample, married individuals are more likely to answer all three financial literacy questions correctly. The gender gap in financial literacy is stark and comparable in size to differences by income: the average number of correct answers is 1.9 for women and 2.4 for men. Low-income men have similar financial literacy levels as high-income women.

In addition to financial literacy, financial decision making requires knowledge of one's assets and debts. Of course, retirees can also seek advice from professionals or friends who have greater financial knowledge as they attempt to manage their wealth. Our population consists entirely of retirees, many of whom are already using money from the SRP to supplement current expenditures. Thus it is not surprising that 90 percent of individuals in each of the income categories report that they know their SRP account balance.

For this group of retirees with relatively low levels of financial literacy, it is important to note that more than 90 percent report that they have sought advice when making financial decisions[19]. About half report that they asked for assistance from their employer and its HR benefit office concerning financial decisions, and many have turned to professional financial advisors for assistance. Even among households with less than $50,000 of annual income, one-fifth had sought professional financial advice. This high level of seeking help with financial decisions is consistent

with the observation that these retirees have low financial literacy and may have limited confidence in their ability to make good decisions. We find only small differences in the willingness of retirees to seek financial advice by marital status.

To further explore the relationship between our objective financial literacy measures and individuals' self-assessed of financial acumen, we asked respondents to rate their own financial knowledge on a scale of one to seven (seven being the highest level). In general, the self-reported measure of knowledge is positively correlated with objective measures based on the answers to the financial literacy questions. Individuals who give themselves a higher score that reflects greater knowledge and understanding also tend to answer more of the literacy questions correctly. Yet the relationship is not linear and suggests possible overconfidence for those in the lowest income brackets. Interestingly, the number of correct answers to the financial literacy questions rises with higher levels of income for each self-reported level of financial literacy.[20]

Incidence of Financial Distress among Retirees

Previous sections have examined the economic status of public sector retirees by various household characteristics. We now extend this analysis by estimating a series of multivariate regressions to assess the financial problems facing low-income households. Table 3 presents estimates of average marginal effects from five multivariate regressions on the alternative measures of financial distress described earlier. Our measures of financial problems are:

(1)   The household had to draw down savings due to expenditures exceeding income.

(2)   The household borrowed money from friends or family members because expenditures exceeded income.

(3)   The household kept a balance on its credit cards as it was unable to pay the full balance.

(4)   The household fell behind on payments or did not pay bills when spending exceeded

income.

(5)   The household indicated that it would not be able to come up with $2,000 within the next

month.

In Table 3, the dependent variable is one of these measures of financial distress which takes a value

of one if the respondents indicate having met any of these criteria. The explanatory variables are

economic and demographic characteristics likely to be associated with financial distress.

Table 3 here

As expected, low annual income is positively associated with the likelihood of indicating

that a household faced these financial problems. For all five of our indicators of financial distress,

higher income respondents are less likely to report that they had any of these financial problems.

Marginal effects reported in Table 3 for higher levels of income are relative to the probability of

households with less than $25,000, as they are the reference category. The coefficients of higher

income are statistically significant for two measures 'got behind on payments when spending

exceeded income' and 'cannot come up with $2,000' in the last two columns. This is not a

surprising result: higher annual income results in a lower probability of facing financial distress.

Financial literacy continues to influence financial decisions. In the multivariate analysis,

the measure of having spent out of savings when spending exceeded income, we see that those

with greater financial literacy are able to cover these expenses by accessing their wealth. Further,

scoring higher on the financial literacy questions is associated with a statistically significantly

lower probability of having the final two measures of financial distress, as shown in Columns 4

and 5.[21] Again, for the measure of having spent out of savings when spending exceeded income,

there is no significant relationship with knowledge about SRP balances but those with lower

balances are more likely to be accessing them. It is not surprising that the results for the measure of having spent out of savings when spending exceed income differ from the other four measures, since it seems to indicate of a normal drawdown phase in the household's life cycle. Yet, holding all else equal, having zero or low SRP assets is associated with significantly higher rates of financial distress for all four measures.

Financial distress is also related to demographic characteristics. All else equal, women are more likely to spend out of savings or to have a credit card balance when spending exceeds income. Non-Hispanic Blacks are more likely to report financial distress relative to non-Hispanic Whites. Older individuals are less likely to report financial distress, holding years since retirement constant. One potential explanation is that older cohorts are more conservative with spending and less likely to spend out of savings.

Another method of measuring the degree of distress uses a binary variable indicating whether the retiree reported having any of the last four types of financial problems shown in Table 3. In this analysis we do not include 'spent out of saving when spending exceeded income' as a measure of financial distress for the reasons discussed above. The indicator is a dummy variable that is equal to one if the respondent experiences any type of financial distress. Table 4 reports the average marginal effects from a Probit model on the financial distress indicator marital status.

Table 4 here

Similar to the earlier results, Columns 1 and 2 indicate that higher income is associated with lower likelihood of being in financial distress. The more financially literate have significantly smaller values for the financial distress index, on average, and answering all three questions correctly is associated with a 12.3 percent decrease in the likelihood of being in financial distress for married retirees, versus the sample mean of 31.6 percent. The size of the financial literacy

coefficient is much smaller and insignificant for the non-married sample. Having zero or low SRP balance contributes to higher rates of financial distress. This effect is greater by about 12 percent for the sample of non-married retirees, suggesting that wealth is even more important for retirees without spousal income. Not surprisingly, married households are less financially distressed than retirees without spouses. Female retirees are more likely to be financially distressed and the gender gap is larger for non-married individuals. Older individuals experience lower levels of financial distress. Being non-Hispanic Black is associated with higher value one the financial distress index.

We now consider whether individuals make what seem to be obvious financial mistakes and what household characteristics are associated with these mistakes. Columns 3 and 4 in Table 4 present estimated marginal effects from a regression on having made a financial mistake for both the married and non-married samples. The dependent variable is equal to one if the individual kept card balances or got behind on payments when spending exceeded income while simultaneously having a positive SRP balance. Individuals with higher household income experience lower rates of financial mistake. Our results confirm that financial literacy is associated with a significantly lower probability of making a financial mistake, and the effect size is larger for the married sample. Again, having a smaller SRP balance, potentially a financial mistake itself, is associated with a significantly higher probability of making a financial mistake in both Columns 3 and 4. Above, we saw that older individuals have lower levels of financial distress. Here, older individuals are less likely to make a financial mistake, all else equal. Unlike financial distress, there is no significant gender gap in the likelihood of making a financial mistake. While the coefficient size for non-Hispanic Black is similar in both columns, the effect is not significant.

These results demonstrate that even for this population of highly-insured retirees, there is still a sizeable amount of financial distress and retirees are observed making financial mistakes.

High income, more financial literacy, and high levels of SRP savings are associated with less financial distress and a lower probability of making financial mistakes.

Conclusion

Career public employees typically earn considerably more generous retirement benefits than do most private sector employees. Retirement benefits include DB pension plans and retiree health insurance along with social security and Medicare. Using a sample of recent retirees in North Carolina, this research provides the first comprehensive assessment of the economic status of public sector retirees. The mean household income for all public sector retirees in North Carolina who retired between 2009 and 2014 was $75,000, but 29 percent of retirees reported household incomes below $50,000 in 2016. Our analysis focuses on the economic problems confronting these lower income households. We find that over 45 percent of households with incomes below $50,000 reported experiencing at least one of our four measures of financial distress. Retirees in low-income households tend to have lower levels of financial literacy and those with low financial literacy are more likely to be making asset and debt management decisions that seem to be errors.

Even though public employees are covered by relatively generous retirement benefits, many individuals may face difficult financial circumstances in retirement. One reason is that not all retirees from state and local government agencies have long careers with their employers and thus they will tend to have earned relatively low pension benefits. Second, government employees tend to be paid lower salaries compared to private sector workers with similar qualifications. Thus, public sector employees need to save while working to have sufficient resources in retirement to achieve their desired standard of living in retirement.

Our analysis shows that even low-income public sector retirees have assets as they enter retirement, so managing these assets carefully along with their debts will influence their economic status throughout retirement. We have shown that financial literacy is an important determinant of wealth management, and the lease financially literate are more prone to making financial errors. Our findings suggest that financial education programs may help as individuals do a better job of managing their savings and assets in retirement.

While we focus on low financial literacy as one explanation for making financial mistakes in this paper, there may also be other reasons for suboptimal use of assets in retirement. One explanation might be that retirees believe the cost of borrowing to be lower than the cost of withdrawal and the forgone returns of SRP assets. Mental accounting is another candidate if retirees consider household wealth in SRP accounts as 'nonfungible' and consciously set it aside. Future studies could examine actual costs of borrowing for household debt in retirement.

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Endnotes

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[1] The median category of household income for our sample is $50,000 to $75,000 per year in 2017.

[2] Previous studies have found that financial illiteracy is more prevalent among the least educated and minorities (Lusardi and Mitchell 2007; Seligman 2012), and that financial knowledge is positively linked with important financial decisions such as retirement planning, retirement saving plan participation, stock investment, less high-cost borrowing, less self-reported over indebtedness, and wealth (Clark et al. 2006; Clark et al. 2017a, 2017b; Duca and Kumar 2014; Lusardi and Mitchell 2007, 2011a; Lusardi and Tufano 2015; van Rooij et al. 2011).

[3] Poterba at el. (2013) show that 93 percent of those in the age group 60-69 withdrew less than 5 percent of their balance.

[4] The Federal Reserve Bank of New York (2018) shows that aggregate household debt has increased for 14 consecutive quarters as of December 31, 2017 and reached the all-time peak of $13.15 trillion.

[5] Median credit card debt rose sharply from $1,320 to $2,430 from 1992 to 2010 (Copeland 2013).

[6] Description of the benefits from these two retirement systems are provided on their websites:

https://www.nctreasurer.com/ret/Benefits%20Handbooks/TSERShandbook.pdf

https://www.nctreasurer.com/ret/Benefits%20Handbooks/LGERShandbook.pdf

[7] The surveys were fielded as part of a grant from the Sloan Foundation examining the transition from career employment to complete retirement. For more information about the data and copies of the survey instrument, see: https://sites.google.com/site/publicsectorretirement/.

[8] Respondents were asked to report whether their annual household income fell into one of a series of brackets. Options were: less than $25,000, $25,000 to $49,999, $50,000 to $74,999, $75,000 to $99,999, $100,000 to $149,999, $150,000 to $249,999, $250,000 or more, and Don't Know.

Individuals who responded 'Don't Know' when asked to report their annual income were excluded from the analysis.

[9] We define married retirees as having reported 'Married' or 'Living with a partner' in the 2017 survey. Non-married retirees may be widowed, divorced, separated, or never married.

[10] Only a few public sector employers have adopted automatic enrollment in their SRPs (Clark and Pelletier 2018).

[11] Married retirees report household SRP balances in our survey.

[12] Imputed SRP balance is equal to half of the upper bound in each SRP balance category. For the largest SRP balance category '$250,000 or more', imputed value is equal to the lower bound in this category multiplied by 1.2.

[13] The proportion retirees in our study with an SRP account and the balances in these accounts are somewhat greater than those reported by Poterba et al. (2011). They found that 52 percent of households headed by someone between the ages of 65 and 69 had positive assets in retirement saving accounts and the mean balance was $121,137. The mean balance in our sample is also about twice the size of their estimates, possibly due to the fact that survey responses are on household account balance in our sample.

[14] Lusardi, et al. (2014) reported that 41 percent of credit card holders age 62-66 held credit card debt in the 2015 wave of the National Financial Capability Study.

[15] Lusardi et al. (2020) report that 23.3 percent of individuals age 62-66 surveyed in the 2015 wave of the National Financial Capability Study indicated that they 'could not come up with $2,000 if an unexpected need arose within the next month.'

[16] Scholnick et al. (2013) define financial mistakes as keeping a credit card balance while holding sufficient deposits at the issuing bank. Agarwal and Mazumder (2013) study the suboptimal use

of credit cards after balance transfers that results in higher APR. Agarwal et al. (2009) also consider high-cost borrowing behavior as a financial mistake, such as paying excessive APRs and credit card fees.

[17] These three questions were designed by Lusardi and Mitchell and first implemented in the 2004 Health and Retirement Study (see Lusardi and Mitchell 2011a). The same questions were subsequently added to several other surveys and have been used in numerous studies (Lusardi et al. 2014; Lusardi and Mitchell 2011b; Lusardi and Mitchell 2007). While the questions seem rather simple, the research indicates a rather low level of correct answers across a wide range of sample populations.

[18] Online Appendix Table 3 shows the percentage of each income group that answered each of the questions correctly by marital status.

[19] See Online Appendix Table 4.

[20] In Online Appendix Table 5, retirees are grouped into three self-reported levels of financial literacy by marital status: low literacy indicates those that reported a knowledge level of one or two, moderate literacy indicates that rated themselves at levels three, four and five, and high literacy indicates individuals who indicated a level of six or seven. The entries indicate the number of correct answers for the financial literacy questions for each of the income groups.

[21] In addition, Online Appendix Table 5 suggests that low financial knowledge in terms of not knowing one's SRP balance is positively correlated with a higher likelihood of financial distress as measured by three out of four financial distress measures.

Table 1. Sample means for retirees

	All Retirees	2017 Survey Respondents
	(1)	(2)
Age at Claiming	60.7	59.6
Age at Termination	60.7	58.8
Male (%)	34.2	32.7
Early Retirement Benefit (%)	36.1	34.5
TSERS Participant (%)	79.1	78.4
Works at Community College (%)	4.3	5.3
Works at Local Government (%)	20.9	22.2
Works at Primary Government (and Proprietary Unit) (%)	19.8	18.8
Works at Public Schools (%)	46.9	42.0
Works at University (%)	8.1	11.8
Years of Service	22.9	24.1
Years of Service 5-19 (%)	35.1	31.1
Years of Service 20-24 (%)	15.7	12.7
Years of Service 25-29 (%)	19.2	17.9
Years of Service 30+ (%)	30.1	38.3
Final Average Salary ($)	51,447	62,089
Net Annual Pension Benefit ($)	19,220	23,680
N	72,350	3,557

Source: Authors' calculations from the administrative records of TSERS and LGERS for individuals who retired and claimed benefits between 2009 and 2014.

Table 2. Financial distress by annual household income and marital status

Measures of Distress	Full sample	Annual Household Income			
		<$25K	$25K - $50K	$50K - $75K	>$75K
Married Retirees					
Spent out of savings when spending exceeded income	37.9	48.9	44.0	39.4	34.9***
Borrowed money from friends or family when spending exceeded income	2.1	4.3	5.4	2.1	1.0***
Kept card balance when spending exceeded income	22.6	34.0	28.1	24.7	19.6***
Got behind on payments or did not pay bills when spending exceeded income	3.2	10.6	7.7	3.1	1.6***
Cannot come up with $2000 within the next month	8.7	27.7	21.5	9.3	4.0***
Average number of items checked	0.7	1.0	0.9	0.7	0.6***
Proportion of financial mistakes by income[a]	22.1	38.9	27.9	23.8	19.5***
Number of Retirees	2,453	47	391	677	1,338
Proportion of sample (%)		1.9	15.9	27.6	54.6
Non-Married Retirees					
Spent out of savings when spending exceeded income	38.8	38.4	41.4	39.8	27.8***
Borrowed money from friends or family when spending exceeded income	5.6	12.5	7.0	2.6	1.6**
Kept card balance when spending exceeded income	32.2	35.7	35.4	30.3	22.2***
Got behind on payments or did not pay bills when spending exceeded income	7.8	17.9	8.6	5.5	1.6***
Cannot come up with $2000 within the next month	16.9	35.7	19.9	9.5	5.6***
Proportion of financial mistakes by income	31.5	42.5	34.1	30.0	19.1***
Average number of items checked	0.8	1.0	0.9	0.8	0.5***
Number of Retirees	956	112	444	274	126
Proportion of sample (%)		11.7	46.4	28.7	13.2

Note: P-values are from proportions test on each variable between households with income over $75k and households with income below $75k. * $p<0.1$; ** $p<0.05$; *** $p<0.01$.
[a] Financial mistake is defined as having positive SRP balance but having kept card balance or got behind on payments when spending exceeded income.

Source: Authors' calculations based on the 2017 survey.

Table 3. Regression of financial distress measures

	Spent out of savings when spending exceeded income	Borrowed from friends or family when spending exceeded income	Kept card balance when spending exceeded income	Got behind on payments or did not pay bills when spending exceeded income	Cannot come up with $2000 within the next month
	(1)	(2)	(3)	(4)	(5)
Income $25K-$50K	-0.010	-0.001	-0.015	-0.006	-0.027*
	(0.042)	(0.006)	(0.035)	(0.004)	(0.012)
Income $50K-$75K	-0.065	-0.009	-0.023	-0.010	-0.053**
	(0.043)	(0.005)	(0.036)	(0.005)	(0.012)
>$75K	-0.131**	-0.011	-0.041	-0.015*	-0.083**
	(0.045)	(0.007)	(0.038)	(0.007)	(0.017)
Number of Correct Answers to FinLit Questions	0.042**	-0.001	-0.012	-0.005**	-0.021**
	(0.010)	(0.002)	(0.009)	(0.002)	(0.004)
Don't Know SRP Balance	-0.015	0.005	0.101**	0.054**	0.093**
	(0.040)	(0.012)	(0.041)	(0.029)	(0.034)
SRP Balance <$100K	0.043*	0.025**	0.187**	0.052**	0.110**
	(0.019)	(0.005)	(0.017)	(0.007)	(0.011)
Female	0.063**	0.002	0.033*	-0.004	0.013
	(0.018)	(0.004)	(0.016)	(0.004)	(0.009)
Married	0.047*	-0.007	-0.042*	-0.006	0.004
	(0.021)	(0.005)	(0.019)	(0.004)	(0.009)
Non-Hispanic Black	-0.085**	0.030**	0.000	0.035**	0.095**
	(0.028)	(0.010)	(0.024)	(0.011)	(0.019)
Hispanic	-0.083	0.011	0.099	0.023	0.038
	(0.099)	(0.028)	(0.107)	(0.032)	(0.059)
Age at Survey	-0.001	-0.002**	-0.010**	-0.001**	-0.003**
	(0.002)	(0.000)	(0.002)	(0.000)	(0.001)
Years since Retirement	0.001	0.000	-0.003	0.000	-0.001
	(0.002)	(0.000)	(0.002)	(0.000)	(0.001)
Bachelor's Degree or Above	0.064**	-0.003	-0.003	0.004	-0.011
	(0.020)	(0.004)	(0.018)	(0.003)	(0.009)
Net Annual Pension Benefit ($10K)	0.002	-0.005**	0.002	-0.006**	-0.011**
	(0.006)	(0.002)	(0.006)	(0.002)	(0.004)
Observations	3,401	3,401	3,401	3,401	3,397
Mean dependent variable	0.381	0.031	0.253	0.045	0.110

Note: Each dependent variable is a dummy variable that takes the value of 1 if the individual experienced each type of financial distress. Estimates are marginal effects from a probit model. * p<0.1; ** p<0.05; *** p<0.01.

Source: Authors' estimates based on the 2017 survey except level of education, which was obtained in the 2015 survey.

Table 4. Regression of indicators for financial distress and financial mistake

	Financial distress indicator		Financial mistake indicator	
	Married	**Non-married**	**Married**	**Non-married**
	(1)	**(2)**	**(3)**	**(4)**
Income $25K to $50K	-0.079	-0.075	-0.082	-0.068
	(0.056)	(0.056)	(0.053)	(0.058)
Income $50K-$75K	-0.140*	-0.104	-0.096	-0.067
	(0.053)	(0.064)	(0.055)	(0.066)
Income >$75K	-0.169**	-0.173*	-0.116	-0.142
	(0.064)	(0.071)	(0.066)+	(0.066)+
Number of Correct Answers	-0.041**	-0.005	-0.027**	0.016
to FinLit Questions	(0.011)	(0.019)	(0.010)	(0.020)
Don't Know SRP Balance	0.084	0.180	0.074	0.195*
	(0.046)+	(0.095)+	(0.043)+	(0.098)
SRP Balance below $100K	0.206**	0.322**	0.165**	0.236**
	(0.021)	(0.035)	(0.021)	(0.036)
Female	0.010	0.108*	0.004	-0.070
	(0.020)	(0.043)	(0.019)	(0.042)
Non-Hispanic Black	0.092**	0.175**	0.052	0.050
	(0.038)	(0.047)	(0.038)	(0.053)
Hispanic	0.037	0.145	-0.017	-0.127
	(0.129)	(0.199)	(0.132)	(0.171)
Age at Survey	-0.014**	-0.010**	-0.012**	-0.011**
	(0.002)	(0.004)	(0.002)	(0.004)
Years since Retirement	-0.003	0.001	-0.003	0.004
	(0.003)	(0.005)	(0.003)	(0.005)
Bachelor's Degree or Above	-0.013	0.024	-0.005	0.051
	(0.022)	(0.040)	(0.021)	(0.041)
Net Annual Pension Benefit	-0.008	-0.004	-0.002	-0.004
($10K)	(0.007)	(0.016)	(0.006)	(0.016)
Observations	2,445	952	2,243	766
Mean dependent variable	0.275	0.420	0.221	0.315

Note: The dependent variable is a binary variable that takes the value of 1 if the individual experienced at least one type of financial distress in Columns (1) and (2). The four measures of financial distress are those listed in Table xx.4, excluding 'Spent out of savings'. In Columns (3) and (4), the dependent variable is a binary variable that takes the value of 1 if the respondent kept card balance or got behind on payments when spending exceeded income, conditional on having a positive SRP balance. Estimates are marginal effects from a probit model. * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Source: Authors' estimates based on the 2017 survey except level of education, which was obtained in the 2015 survey.