The Effects of Retiree Health Insurance Plan Characteristics on Retirees' Choice and Employers' Costs

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Abstract: Employers everywhere struggle to moderate the rate of growth of the cost of providing health insurance to active and retired employees. Although most private sector employers have eliminated retiree health insurance (RHI), the majority of public sector employers continue to offer it. Employers have adopted a variety of plan modifications to reduce employer costs and move retirees into less expensive plans. This raises two questions: do incentives produce the desired plan elections, and do these changes, along with cost shifting, produce the expected reductions in cost growth? This paper examines a series of policy modifications implemented by the State of North Carolina State Health Plan. Using individual-level administrative data on retirees' plan choices, along with aggregated data on expenditures for retirees, the analysis estimates the effects of the introduction and subsequent repeal of a Comprehensive Wellness Initiative (CWI) for non-Medicare eligible retirees, as well as increases in coinsurance and copayments and the introduction of a premium for all retirees. Over a third of non-Medicare eligible retirees shifted into the least generous plan between June 2009 and December 2012. The evidence suggests that the level effects on both current year costs and unfunded actuarially accrued liabilities (UAAL) were relatively modest, but the growth rate was diminished. Additionally, increases in the employee/retiree premiums did reduce long-term projected costs.

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I. Introduction

Most state and local government employers allow retirees to continue to be enrolled in their employee health plans.[1] While retiree health insurance (RHI) is common in the public sector, this benefit has been rapidly disappearing in the private sector.[2] Important factors that influence firms to eliminate this benefit include the continuing rapid increase in the cost of health insurance coupled with the aging of the population and increasing longevity of retirees (which results in more retirees relative to active workers and increases the total cost). The decline in private sector coverage of RHI also coincided with the issuance of new standards by the Financial Accounting Standards Board in 1989 that required firms to acknowledge unfunded liabilities associated with these plans on their balance sheets (FASB, 1989). After FAS 106, employers were forced to properly value the cost of this benefit, and many chose to eliminate their RHI plan after this.

Public sector employers are now facing the same cost pressures as private employers and, in response, have been adopting policies in an effort to limit the cost associated with providing RHI. In 2004, the Governmental Accounting Standards Board issued Statement No. 45 requiring public employers to also acknowledge the unfunded liabilities associated with RHI plans for public employees (GASB, 2004). In

[1] Franzel and Brown (2013) report that between 2002 and 2006, 92 to 96 percent of state government units offered health insurance to their retirees under age 65. There has been a substantial decline in the incidence of retiree health insurance after 2005 and the proportion of state governmental units with retiree health insurance fell to 69 percent in 2011.

[2] Kaiser Family Foundation (2012) reports that only 25 percent of firms with 200 or more workers that offer health benefits to their active employees extend this coverage to retirees. This is down from 66 percent in 1988.

the public sector, accounting is less important than cash flow, and so, for the most part, the new accounting standards did not lead to a substantial decline in RHI coverage in the public sector.

A retiree's choice of health plan could affect her economic well-being both through annual out-of-pocket costs and through exposure to the risk of a high-cost health event. Most public employers offer workers the choice of several different types of health insurance plans. In many states, workers can choose from HMOs, PPOs, indemnity plans, and consumer-driven high deductible plans. Even when a state offers only one type of plan, employees and retirees usually are able to select among several options within the plan type. The plan options typically differ in the premium the retiree must pay, the level of deductibles and co-payments, and the percentages of co-insurance payments. Employers may attempt to reduce costs by providing incentives (either subsidies or penalties), in an effort to reduce costs and shift retirees into less generous plans.

While most public employers continue to offer RHI as an employee benefit, plan modifications that shift cost to the retiree have the potential to degrade the promised benefit.[3] On the other hand, for the provision of RHI to be sustainable, plan modifications and cost shifting can be an avenue to reduce costs and shore-up the long-term viability of this benefit. Public sector employers facing large unfunded RHI

[3] Franzel and Brown (2013) report that in each of the past three years, over 60 percent of state governments responding to a survey had made changes in the health benefits offered to employees and retirees with 31 percent stating that they had shifted more health care costs from the employer to retirees by raising premiums, copayments, and/or increasing deductibles. In addition, the states have been increasing the age of eligibility and years of service required in order to vest in the retiree health plans.

liabilities might otherwise have to raise taxes and/or reduce spending on other priorities in order to provide this expensive employee benefit (for a discussion, see Clark and Morrill 2010, 2011).

Large unfunded liabilities associated with employer-provided RHI, and the continued existence of these plans, has driven the need and desire for plan reforms in many states (Franzel and Brown 2013). To date, there has been little systematic assessment of the impact of policy changes on these plans and the benefits they provide to retirees. This analysis provides a unique evaluation of how retirees respond to efforts to shift workers from higher cost to lower costs plans through wellness programs and premiums. The study uses data on retired teachers and state employees in North Carolina's State Health Plan (SHP).[4]

The plan has made a series of policy changes that have produced substantial movement between the two PPOs currently offered by the state. Using monthly enrollment data and administrative records from July 2009 through December 2012, we track the movements between plans as two wellness programs are adopted and then removed and a premium is added to the Standard Plan. We explore the characteristics of retirees who change plans. In addition, we assess the impact of the policy changes and varying plan choices on the annual cost of the state health plan and the unfunded liability of the retiree health plan. The key finding of the analysis is that policy changes such as the implementation of comprehensive wellness programs resulted in a substantial shift of non-Medicare retirees across types of PPOs. At the same time,

[4] In North Carolina, the State Health Plan (SHP) offers exactly the same benefits to active and retired state employees and teachers, with the exception that when retirees reach age 65 they must enroll in Medicare which becomes their primary insurer.

Medicare-eligible retirees, who were not affected by the first set of policy changes, remained in their preferred plan. Despite this large shift in plan choice among NMR, the resulting contemporaneous cost savings was modest in levels. However, the evidence suggests that cost growth was moderated. Additionally, increases in retiree-paid premiums did reduce the long term costs associated with RHI.

II. Background on the North Carolina State Health Plan (SHP)

The North Carolina State Health Plan (SHP) is self-funded and covers all public school teachers and state employees, including both active and retired workers. As in many states, the rapidly escalating cost of this employee benefit threatens to swamp the state budget as health care expenditures grow faster than state revenues.[5] Until September 2011, public sector employers in North Carolina paid the full cost of the premium for employees for all health plans offered by the state, but the employees paid the full premium for dependent and family coverage. Because of both escalating costs and large unfunded liabilities associated with the retiree health plan, North Carolina has implemented several measures to moderate the growth of health insurance costs for active and retired employees, including increasing cost-shifting and implementing wellness initiatives. North Carolina is a particularly interesting case to study because a change in the political environment lead to the repeal of the Comprehensive Wellness Initiative (CWI) just 14 months after it was first implemented. At the same time, a premium on the more generous plan was introduced, causing a large shift to the more

[5] GAO (2011) predicts that in the United States state and local government expenditures on health care, including both Medicaid programs and the provision of health insurance to active and retired workers, will grow substantially faster than GDP. They argue that their simulations project a rise in health-related costs that is (p. 4) "the root of the fiscal difficulties" faced by state and local governments nationally.

basic plan offering. Thus, over a two year span, the state implemented three major policy changes that affected their choice of a health insurance plan. In the following analysis, we show that in response to the policy changes over one third of retirees who were not eligible for Medicare shifted from one plan to the other.

In North Carolina, public employees may continue their health insurance coverage in retirement with the full cost of the premium paid by the state in at least one plan as long as some specified minimum years of service requirement are met.[6] Actuarial reports produced in accordance with the GASB 45 rule indicate a large and growing liability associated with these promised benefits. North Carolina is typical of most states with large unfunded liabilities in that not only is the promised benefit generous, but little funds have been set aside to meet this obligation and funding is generally "pay-as-you-go." According to estimates in Clark and Morrill (2011), North Carolina ranked fifth in unfunded actuarially accrued liability (UAAL) levels and eighth in per capita UAAL among state employee retiree health plans.[7]

The predecessor to the SHP was established in 1972 to provide health insurance to teachers and state employees.[8] Initially, the appropriation by the legislature for state employee health insurance was not to exceed $10 per month for each employee. In

[6] Retirees must be receiving a pension benefit from employment in North Carolina to be covered by the health insurance plan. Workers hired after 2006 are subject to the following premium schedule based on years of service: 5-9 years must pay full premium, 10-19 years must pay 50 percent of premium, and 20 or more years pay no premium. All retirees must still pay the full premium for dependent health.

[7] Pew (2011) and Franzel and Brown (2012, 2013) both report similar levels of underfunding.

[8] In North Carolina, most of the funds for salary and benefits for teachers are provided by the state, and teachers and state employees are in the same pension plan and health insurance plans.

1974, the state began allowing retired employees who were receiving a retirement annuity from the Teachers and State Employees Retirement System to remain in the health plan. In the early years, the retiree had to pay the full premium for health insurance coverage. In 1976, the state created a separate insurance benefit for Medicare eligible retirees and began requiring retirees to enroll in Medicare when they became eligible to do so. In 1978, the state appropriated sufficient funds to pay the full premium for retirees, thus making retiree health insurance noncontributory.

Today, the North Carolina SHP provides health insurance to active and retired teachers and state employees and their spouses and dependents (hereafter we refer to children, spouse, and family coverage as simply "dependent coverage"). The premium for dependent coverage is calculated using a common risk pool for dependents of both active workers and non-Medicare eligible retirees (hereafter NMR), so the price NMR must pay is less than what would be typically found on the open market for health insurance prior to Medicare eligibility. This potentially leads to adverse selection into the risk pool, since the retirees with the highest costs will be those with the most to benefit from participating in the plan. Active and retired workers are subject to the same deductibles and co-payments and are able to purchase dependent coverage, but the premium for dependent coverage does vary by whether the individual and/or the dependents are eligible for Medicare. For simplicity we group subscribers into two categories, Medicare-eligible retirees (MCR) and non-Medicare eligible retirees (NMR), based on the subscriber's status.[9]

[9] Alternatively, one could also group by whether the subscriber covers dependents and whether any dependents are eligible for Medicare. Employee premiums vary by dependents' eligibility for Medicare, but plan rules apply only to the subscriber's status.

Retired teachers and state employees meeting a minimum years of service requirement are eligible to continue their participation in the SHP.[10] When first introduced, retired employees who were receiving a state retirement benefit (which required five years of service) were eligible to continue receiving the state health insurance for the rest of their lives without paying any premium for this coverage.[11] Since the plan was implemented, the ratio of retirees to workers increased, health care expenditures per person rose, and life expectancy increased. As the magnitude of the cost of this employee benefit became more salient, state policy makers began to focus on the escalating costs, especially for employees who had relatively short careers with the state. In 2006, the state raised the eligibility requirement for all newly hired employees.[12] Since the change in eligibility standards applies only to persons hired after 2006, the short term impact of this change has only a modest effect on current cost and the accrued liabilities of the SHP.[13]

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[10] Upon becoming Medicare eligible, retirees must enroll in Medicare. Medicare becomes the primary payer for these individuals, thus reducing the cost to the state of providing what becomes supplemental health insurance.

[11] The service requirements for RHI were quite minimal. For example, at that time, someone could have worked for a local government that did not participate in the SHP for at least 5 years, then work for the State for one month and get RHI indefinitely.

[12] The years of service requirements for eligibility for those hired after 2006 are listed in footnote 4. The first retirees covered by these new rules would have retired on October 1, 2011. Any individual hired prior to 2006 was eligible for RHI as long as he/she is receiving a retirement benefit from the system and worked at least five year in a job covered by the SHP.

[13] It is interesting to note that the General Assembly enacted the same change in eligibility requirements for retiree health insurance in 1995 (SL1995-507). However, before these new standards could affect any retirees, the legislature eliminated the new requirements and reestablished the old eligibility standards in 2000 (SL2000-184).

The structure of the SHP is somewhat unique. A subscriber, who is either an active employee or retiree of the State, has the option to cover dependents (children, spouse, or family coverage). Until September 2011 the employer paid the full premium for the employee/retiree for either the Standard or Basic Plan. The Standard Plan is identical or superior to the Basic Plan along each dimension. Thus, a subscriber that is not covering dependents would have no reason to voluntarily choose the Basic Plan prior to September 2011. However, the SHP stipulates that the subscriber be in the same plan as his/her dependents. Employees/retirees that cover dependents may therefore choose the less expensive Basic Plan so that the premiums associated with dependent coverage are lower. All plans are Preferred Provider Organizations (PPOs) administered by Blue Cross and Blue Shield of North Carolina.[14]

Typically, the SHP plan is funded by the legislature in two year cycles, so that any modifications to premiums or other plan design features would happen every other year and be effective as of July 1 of an even numbered year.[15,16] However, over the course of

[14] In the year prior to our data, the SHP was offering employees the choice of three plan options: the Basic Plan with a 70/30 co-insurance split, the Standard Plan with 80/20 co-insurance split, and the Premium plan with a 90/10 co-insurance split. The Premium Plan required the employee to pay a premium for coverage, and as of July 2009 that plan was eliminated and subscribers in the Premium Plan were defaulted into the Standard Plan. In June 2009 about 12 percent of retired subscribers were in the Premium Plan (16,730 retirees). Of those, only 33 were in the Basic Plan in July 2009.

[15] This is not a requirement, but in recent years the political process has been such that modifications (typically benefit cuts) are only adopted in non-election years.

[16] The 2009-2010 session of the NC General Assembly had a 68-52 Democratic majority in the House and 30-20 Democratic majority in the Senate with a 10-5 majority of Democrats on the Joint Committee on Employee Hospital and Medical Benefits. For the 2011-2012 session, the Republicans gained the majority in both chambers for the first time since 1870. During that

the time period studied, plan changes were implemented off-cycle because of the time needed to implement the policy changes. The plan is self-funded with funds coming through employer and employee contributions and state appropriations. Cost shortfalls are met with special funding allocated as needed.[17]

Table 1 summarizes the premiums that would be paid by the subscriber and his/her employer under each regime between July 2009 and June 2013.[18] Note that family coverage was also available, so this list is not a complete set of premiums and plan options available to retirees. The premiums also vary by whether the employee/retiree and his/her dependents are eligible for Medicare. The most common combinations are presented in Table 1. Table 2 describes other important differences between the plans in terms of copayments and coinsurance rates.

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session the House had a 68-52 Republican majority and the Senate had a 31-19 Republican majority. Technically, the Joint Committee on Employee Hospital and Medical Benefits still existed, but it only met once during the 2011-2012 session and did not make any decisions. During that same session, control over the SHP was moved from the Joint Committee to the Treasurer's Office (the Treasurer, Janet Cowell, is a Democrat and won reelection in the 2012 elections) [see http://www.ncleg.net/gascripts/Committees/Committees.asp]. The change in management was made effective January 1, 2012. Substantial changes to plan offerings are currently being developed and are planned to become effective January 1, 2014.

[17] Since at least 1997, all premiums (employee, employer, and dependents) were increased by the same percent regardless of the relative experience. There were only some minor exceptions to this, such as when spousal coverage split off from family coverage and when the employee only premium was introduced in 2011.

[18] Nationally, the total cost of employee health premiums for state employees in 2009 averaged $474 with employees paying an average of 8 percent of the total cost for individual coverage. Data from a survey by the National Conference of State Legislatures found that in 2009 the average total premium for family coverage was $1,062 with employees paying an average of 18 percent of the total premium (Cauchi, 2009).

[Table 1]

[Table 2]

Tables 1 and 2 illustrate that the Standard Plan weakly dominates the Basic Plan along every dimension. Although the SHP has generous benefits for retirees, without subsidization the benefits for dependents include large out-of-pocket premium costs. These two tables also illustrate the broad ways that the plan parameters were altered over time. Table 3 provides a summary of the major plan modifications that occurred over the time period of our study. The plan year begins in July. In general, open enrollment periods allow workers to change plans starting in July. Workers and retirees must remain in the same plan throughout the year unless there is a qualifying event that provides them with the opportunity to shift plans.[19]

[Table 3]

The Comprehensive Wellness Initiative (CWI) was phased-in over two open enrollment periods, July 2010 and July 2011. In the first year, all non-Medicare eligible retirees (NMR) were defaulted to the Basic Plan. The CWI did not apply to Medicare-eligible retirees (MCR), regardless of the Medicare-eligibility of any covered dependents. Thus, all MCR were defaulted into their prior plan selections. For NMR, in order to switch from the default Basic Plan to the Standard Plan the subscriber had to attest that she was not a tobacco user and that no covered dependents used tobacco products.[20]

[19] Qualifying events include the birth of a child, employment status change of self or spouse, or a change in marital status.

[20] North Carolina is one of nine states that have established premium differentials for smokers; however, 39 states have instituted programs to help workers stop smoking (NCLS, 2011).

The SHP provided tobacco cessation assistance and members participating in a cessation program were allowed to join the Standard Plan.

In July 2011, the second phase of the CWI went into effect. At this time, all NMR were again defaulted into the Basic Plan, while MCR were not affected. Under CWI-II, the subscriber would have to attest both to not smoking and to not being overweight (defined as having a BMI greater than 40) for him/herself and his/her dependents. It should be noted that the SHP did stipulate that audits of individuals and their behavior might be conducted, but in practice there were no tests actually conducted to make sure individuals were in compliance. This is particularly important for retirees, who are not present at a place of employment where smoking or weight could easily be measured or observed.[21]

Although the full CWI, including the BMI certification, was implemented for the July 2011 open enrollment period, it was quickly repealed. There was a second open enrollment period for September 2011, which had been announced prior to July. Thus the response to CWI-II may have been muted due to the announcement of the repeal. In September 2011, members were defaulted into their July 2011 plan election but had the option of switching to any plan. The CWI was repealed so there were no restrictions on who could choose the Standard Plan, but at the same time a premium was introduced on the Standard Plan for subscribers. Following the ACA rules to maintain "grandfathered"

[21] A tobacco testing plan was developed, but never implemented. The plan was to randomly select subscribers who had attested they did not use tobacco and then test both the subscriber and his/her spouse (if covered). Dependent children were not to be tested, even if over the age of 18. Because the rate of enrollment was roughly equal to the estimated fraction of smokers in the SHP, the SHP felt that members were mostly compliant and audits were not necessary [see minutes of the 8/31/2010 Board of Trustees Meeting].

status, the employee's share of the premiums could only be increased by 5 percent relative to the employee premium in the previous year. Because the previous year's premium was zero, the SHP imposed a premium that was slightly less than 5 percent of the total premium. At the same time, most copayments, deductibles, and coinsurance maximums were increased by approximately 16 percent relative to July 2011.[22]

III. Retiree Plan Choices

III.A. Data and Descriptive Statistics

Data used in the analysis on retirees' choices between the two PPOs is derived from the administrative records of the SHP record-keeper, Blue Cross/Blue Shield of North Carolina. The data include plan elections, status, and basic demographics (gender, birth year, employer, and county) for all members for each month from July 2009 through December 2012, along with a member identification code that allows individuals to be linked across periods and for dependents to be linked to the subscriber.[23] Unfortunately, the administrative records do not indicate whether retirees were married or had dependents; we only observe the existence of dependents if the subscriber selects to include them as part of their insurance election at some time during our sample period. The sample is restricted to those who were 50 or older on January 1 of the observation year. Age is measured as observation year minus birth year minus one. For this analysis, we collapsed the data to the subscriber-level and recorded

[22] For dependent premiums, the new employee-only amount was added to the total premium for the employee plus dependent coverage, resulting in an approximately 16% increase in premiums.

[23] The data exclude any member (subscriber or dependent) who is age 90 or older. Thus, in addition to missing some subscribers in the data, we may erroneously classify some older subscribers as having no dependents.

whether the subscriber was covering any dependents. As described above, any dependents must be in the same plan as the subscriber. The final dataset includes 79,090 non-Medicare eligible retirees (NMR) and 126,506 Medicare-eligible retirees (MCR) that appear in the data for at least one month during the time period July 2009-December 2012.[24] The analysis sample is at the subscriber-month level and includes observations for each subscriber in every month in which he/she was a member; this results in an unbalanced panel of plan choice in each month between July 2009 and December 2012. A subscriber is only present in the data in the month-years in which he/she is retired. When the data are expanded to subscriber-months, the final sample includes 2,122,969 NMR-months and 4,323,064 MCR-months.

Table 4 includes sample descriptive statistics, first for the full sample and then broken out by Medicare-eligibility status. Because the CWI did not cover Medicare-eligible members, it is not surprising to see so many fewer Medicare-eligible retirees are in the Basic Plan (as opposed to the Standard Plan), on average. The age categories are broken out to highlight the important time period when individuals first become eligible for Medicare. Although we only observe year of birth, we can assume that those who were ages 64 or 65 on January 1 of the given year are almost eligible or newly eligible for Medicare during any month that year.

[24] The data were cleaned by dropping any duplicate observations and any observations where the age rose by more than one year or dropped at all (1,347). We also dropped the less than one percent of the sample that had age greater than 65 and was NMR. Note that while it is possible that someone over age 65 does not qualify for Medicare, that it is unlikely in this setting and could otherwise potentially distort the coefficients on age. Note that approximately 26,000 retirees are observed as NMR and MCR in the data.

The bottom portion of Table 4 illustrates the substantial movement to the basic plan between 2009 and the end of 2012. The first column presents averages across the entire sample, while Column (2) includes only NMR and Column (3) includes only MCR. This same data is presented in Figure 1, except the means are plotted monthly. We observe that CWI was associated with an enormous increase in Basic Plan enrollment among the NMR, from 1.58% in July 2009 to 30.44% in July 2010. However, for MCR retirees, who were exempt from the CWI, we do not observe any such change over the two CWI periods. The repeal of the CWI and concurrent introduction of the premium did not alter the percent enrolled in the Basic Plan by much, although we see that the premium increase did lead to a doubling of enrollment in the Basic Plan among the MCR retirees and a slight drop among the NMR. In Table 8 we explore whether equal proportions of NMR switch into and out of the Basic Plan in September 2011, or whether plan selection did not change for the vast majority of subscribers.

[Table 4]

[Figure 1]

Before turning to the statistically analysis, we present additional figures that illustrate some heterogeneity in response to the plan modifications. Figure 2 further disaggregates the NMR and MCR groups into age categories. As health typically declines with age, we would expect to see that younger subscribers are more likely to be in the Basic Plan than older subscribers, all else equal. Indeed, in Figure 2 we see that the highest rate of Basic Plan enrollment is among the NMR ages 50-59. Although the level of Basic Plan enrollment is always lower than the 50-59 year olds, the age 60-64 NMR have a similar jump in Basic Plan enrollment over the two CWI periods. The youngest MCR, ages 64-69, are slightly more affected by the plan changes than their

older peers, but each MCR age group demonstrates a slight shift upward when the premium was introduced on the Standard Plan.[25]

[Figure 2]

In Figure 3, we restrict the sample to NMR, who are most affected by the plan changes. We consider whether the responsiveness to the plan changes varies by whether or not the subscriber covers dependents. Prior to CWI, a retiree that does not cover dependents would have no reason to enroll in the Basic Plan, since the full premium for the Standard Plan was covered by the employer. Indeed, we see that prior to July 2010 basically no NMR that had self-only coverage elected for the Basic Plan, while less than 10 percent of NMR with dependents elected for the Basic Plan. Interesting, the two CWI periods were associated with similarly sized jumps in Basic Plan enrollment between subscribers who covering dependents and those who were not. We observe that the CWI repeal and premium introduction had a seemingly slightly larger effect on subscribers with dependents. In Table 8, described below, we illustrate that the choice to cover dependents was not affected by the plan modifications.

[Figure 3]

The plan data clearly indicate that these three policy changes produced a considerable shift in enrollment patterns between the two plans. The following statistical analysis indicates how changes vary across demographic characteristics of the retirees.

[25] Age is measured as of January 1st of a given year. We divide the sample by Medicare-eligibility status, but do not observe an individual's exact age. So the MCR age 64-69 group will contain some 64 year olds that qualify for Medicare due to disability. MCR younger than age 64 are excluded from Figure 2, but are included in the regression estimates presented below.

III.B. Regression Analysis of Plan Choice

While Figures 1-3 and the means presented in Table 4 are suggestive of a large impact of the CWI and premium among NMR, it is important to control for secular time trends and seasonality, and potentially any sample composition changes. To assess the changes in plan choice over time, we estimate the following LPM for retirees selecting the basic plan:

$$(1)\ \Pr(Basic_{it} = 1) = \beta_0 + \beta_1 CWI\ I_t + \beta_2 CWI\ II_t + \beta_3 Repeal\ and\ Premium_t + \beta_4 Male_i + \beta_5 Cover\ Dependents_{it} + AGE_{it}\gamma + YEAR_{it} + MONTH_{it} + \mu_i + \epsilon_{it}$$

Here *Basic* refers to the choice of the Basic Plan (opposed to the Standard Plan). The major policy periods are CWI-I (July 2010-June 2011), CWI-II (July 2011-August 2011), and Repeal and Premium (September 2011 – December 2012). The omitted category is the baseline period from July 2009 through June 2010. The specification includes dummy variables for male, covering dependents in that month, and age categories 50-59 (reference group for the NMR regressions), 60-63, 64-65 (becoming or recently transitioned to Medicare-eligible), 66-69 (reference group for MC regressions), 70-79, and 80 and older. All regression specifications include month fixed effects to control for seasonality (open enrollment is always in July, except for the second enrollment in 2011) and year fixed effects to control for secular time trends, such as the aging of the population. Some specifications also include subscriber fixed effects (μ), which controls for time invariant characteristics of individuals such as underlying health, risk aversion, time preferences, etc.

For the first two time periods, CWI-I and CWI-II, the MCR serves as a "control" group for the plan modifications in a difference-in-differences type setting since MCR were not affected by the comprehensive wellness initiatives. However, MCR were

affected by introduction of the premium, albeit with a lower total out-of-pocket expense since the premiums are substantially lower. We have chosen to estimate and present the results for a pooled sample of retirees and then for NMR and MCR separately, rather than estimate a full difference-in-differences model.

Table 5 presents the results from estimating equation (1) first for all retirees and then for NMR and MCR separately. The even numbered columns include subscriber fixed effects. We see that the plan modifications were associated with a large shift into the Basic Plan on average, but this pattern only holds for the NMR. Although the means indicated that the premium increased enrollment in the Basic Plan by the MCR retirees, once covariates are included in the model the coefficient is small and negative. By including individual fixed effects in the even numbered columns we control for any unobserved, time invariant health or socioeconomic characteristics of the individual. Results are largely unchanged when subscriber fixed effects are included, although the age patterns are affected since those effects are only identified off of individuals who cross an age category boundary in a given year (recall that age is actually age on January 1 of a given year, as calculated from year of birth).

[Table 5]

Table 5, Columns (3) and (4) presents results for NMR only. Here we see the plan modifications were associated with large increases in Basic Plan enrollment, controlling for year, month, age, and dependent status. In Columns (5) and (6), we see that the estimated coefficients on the plan modifications for the MCR are small and negative. Interestingly, we do not see a large positive estimated coefficient on the introduction of the premium for the MCR, suggesting that MCR were largely unaffected by the premium increase, on average.

The estimates in Table 5 pooled together those covering dependents (who had to pay premiums throughout the sample period) and those who only had single coverage. In Table 6, we consider the choice to be in the basic plan separately for those covering dependents or not. These equations include subscriber, month, and year fixed effects. Perhaps surprisingly, in Columns (1) and (2), we see that the effects of the policy changes are nearly identical for NMR who cover dependents compared with those that do not. Similarly, in Columns (3) and (4), we again see that on average the plan modifications did not substantially alter the probability of being in the Basic Plan among MCR. The introduction of the premium did lead to a small, positive increase in Basic Plan enrollment, but the point estimates are small. Because there are not large differences by dependent coverage, we group together those covering dependents and those that do not for the remainder of the empirical analysis.

[Table 6]

Next, we consider the special case of individuals in their first month of eligibility. Presumably, these individuals will not be as affected by a "default" and will instead actively be choosing coverage when signing up for the SHP RHI. First, we consider individuals in the first month they have the status NMR. Estimates are reported in the first column of Table 7. The specification is identical to Table 5, Column 3, and includes month and year fixed effects. The data include only one observation per subscriber, since we are observing choice in the first month retired. Means of the dependent variable (signing up for the Basic Plan) are reported in the bottom row of Table 7. When comparing the estimates with those in Table 5, Column 4, we see that the newly NMR are less likely overall to be in the Basic Plan (17.4% versus 25.3%) and that the various plan modifications have a smaller effect, although the magnitude is still large relative to

the mean. We see that the largest increase in the probability of Basic Plan enrollment occurred because of the introduction of the premium on the Standard Plan.

[Table 7]

The second column of Table 7 includes individuals that are first observed in the data as eligible for Medicare. Newly retired employees that are MCR had an overall sign-up rate of 12.9% in the Basic Plan. Note that a small fraction of the sample reports ages below 65, which may be due to eligibility for Medicare through disability. For this group we see basically no impact of any plan modifications, except a small positive coefficient when the premium is introduced. Interestingly, relative to those who begin RHI benefits between the ages of 66-69, we see the largest probabilities of being in the Basic Plan for individuals retiring between ages 60-65. The final column of Table 7 includes individuals who were NMR in the prior month and become newly MCR in the current month. This sample is restricted to those ages 64-65 on January 1 of the given year. Prior results would suggest that the MCR would mostly opt for the Standard Plan, since they would only be affected by the CWI if they covered non-Medicare eligible dependents. However, we see large estimated coefficients for each of the plan changes, indicating that this group of retirees was very much influenced by the plan modifications. This may be due to newly MCR opting to stay in the Basic Plan due to inertia. One potential concern is that the composition of retirees changes as a function of these plan modifications, although we present results in Table 9 demonstrating this is not the case.

III.C. Regression Analysis of Plan Transitions

An alternative way to consider changes in plan choices is to model the transition between the Standard Plan and Basic Plan, and vice versa, at open enrollment periods.

In September 2011 the CWI was repealed and a premium was added to the Standard Plan. Although we do not see a large change in the fraction of individuals enrolled in the Basic Plan, this could be masking a large shift between the Standard and Basic Plans that roughly canceled out. To explore this more formally, we estimate the following equation for NMR and MCR separately.

$$(2)\ \Pr\left(Basic_{i,t} = 1 \mid Standard_{i,t-1}\right) = \beta_0 + \beta_1 Male_i + \beta_2 Cover\ Dependents_{it} + AGE_{it}\gamma + YEAR_{it} + MONTH_{it} + \mu_i + \epsilon_{it}$$

In Table 8, the first three columns present estimates for each of the main plan changes: (1) CWI-I on July 1, 2010; (2) CWI-II on July 1, 2011; and (3) repeal CWI plus introduce a premium on the Standard Plan on September 1, 2011. For these equations, we restrict the sample to those that were in the Standard Plan in the prior month, so the dependent variable is the "transition" from the Standard Plan to the Basic Plan. The final column of Table 8 presents the reverse equation:

$$(3)\ \Pr\left(Standard_{i,t} = 1 \mid Basic_{i,t-1}\right) = \beta_0 + \beta_1 Male_i + \beta_2 Cover\ Dependents_{it} + AGE_{it}\gamma + YEAR_{it} + MONTH_{it} + \mu_i + \epsilon_{it}$$

In equation 3, the sample is now those in the Basic Plan in the prior month and the dependent variable is the transition from the Basic Plan to the Standard Plan. These individuals may be those whose behavior was affected by the CWI but who are not sensitive to the introduction of the premium on the Standard Plan. Panel A of Table 8 presents results for the sample of NMR, while Panel B includes only MCR. The omitted age groups are ages 50-59 in Panel A and ages 66-69 in Panel B. The sample excludes subscribers who changed Medicare eligibility status (NMR versus MCR) in the two-month period.

[Table 8]

Some interesting patterns emerge when considering these month-to-month transitions during the open enrollment periods, presented in Table 8. First, considering the two CWI periods, we observe a large shift from the Standard Plan to the Basic Plan. This may be due to the need to "attest" to not being a tobacco user and not being overweight. However, it may also result from the default being changed to the Basic Plan. We observe that the effect of dependents is opposite under CWI-I and CWI-II. One explanation of this could be that retired public employees in North Carolina are more likely to have dependents that smoke (the point of emphasis in CWI-I) than to have dependents that are obese (the target of CWI-II). Also, the repeal of CWI was announced prior to CWI-II being implemented, so that individuals may have chosen their plan based on the repeal. If subscribers with dependents are less sensitive to the premium, because they are subject to a premium even under the Standard Plan (albeit a smaller premium), that would be consistent with the negative estimated coefficient on covering dependents in columns (2) and (3). In Table 8, Columns (3) and (4) we consider the transition from Standard to Basic and the transition from Basic to Standard, respectively. Interestingly, men are more likely to switch under the CWI than women. Men are slightly more likely to transition to the Basic Plan and significantly less likely to transition from Basic to Standard. Older NMR are less likely than younger NMR to transition from Standard to Basic, perhaps because of greater medical care needs.

Table 8, Panel B, repeats the same exercise for MCR. Recall that MCR were not affected by the CWI and were never defaulted to the Basic Plan. We see that less than a half of a percent of MCR transition to the Basic Plan from the Standard Plan during

either CWI period, and those that do transfer tend to be the youngest. Because nearly all workers were in the Standard Plan prior to the introduction of the premium, only about 2% of the population could be used to estimate Column 4 in Table 8 (Part B), so that has been omitted.

III.D. Robustness Check of Retirement Behavior and Dependent Coverage

One might be concerned that the choice to retire and/or the choice to cover dependents is affected by the plan parameters. As the health plan becomes less generous, workers might postpone retirement (see Shoven and Slavov 2013; Robinson and Clark 2010). If dependent coverage becomes more expensive relative to outside options, we might find subscribers dropping dependents, whose coverage is not explicitly subsidized. Table 9 explores both of these possibilities empirically. First, taking a sample of all subscribers (whether active or retired) ages 50-69, we regress a dummy variable for being retired on the plan period dummies, subscriber, month and year fixed effects, and the age categories (age 50-59 is the omitted category). Even with over 8 million observations, the time period dummy variables do not significantly predict retirement status, once year and month fixed effects are included in the model (except for the pooled sample under CWI-I). Reassuringly, we do observe that there is a strong age gradient with the probability of retirement. The estimated coefficients are very similar when comparing individuals that cover dependents versus those that do not.

[Table 9]

Columns (4) and (5) of Table 9 consider whether the choice to cover dependents is influenced by the plan changes. We might expect that as the generosity of the plan declines, individuals will chose to purchase health insurance in the private market,

switch to spouse's insurance, or choose to go without insurance. However, during this time period, health insurance costs are everywhere rising. The regressions again include subscriber, month, and year fixed effects. Although the coefficients are statistically significant, the magnitudes are small and do not indicate a strong pattern of a decline or increase of dependent coverage due to plan modifications. These results suggest that the CWI, repeal, and premium did not substantially influence the composition of the sample.

IV. Plan Costs and Unfunded Liabilities

Because the Basic Plan had a higher co-insurance rate and less generous plan parameters, the large shift of NMR to the Basic Plan should have led to a notable decline in both experienced and projected costs of RHI. Here we explore whether the rate of annual increase in the total cost of SHP for retirees was affected by these policy changes. While we can directly compare the level differences, it is more difficult to assess what the growth in expenses would have been absent these changes.

When enrollees are shifted from a more generous to less generous plan, one concern is that insurance unraveling could occur whereby the cost of providing the more generous plan increases as the least costly individuals exit to the less generous plan (see Cutler and Reber 1998 for an example of insurance unraveling). In our setting, because subscribers must pay the full cost for dependents and because the CWI was designed to bring less healthy, not the most healthy individuals into the Basic Plan, the extent of adverse selection is predicted to be relatively minor. Reductions in plan generosity are also predicted to decrease the consumption of medical care (reducing "moral hazard" of overconsumption of medical services), as individuals must pay more out-of-pocket for any medical treatments. The benefit of reduced consumption could be outweighed by

the cost of individuals forgoing preventative care and ultimately experiencing greater medical costs.

IV.A. Fiscal Year Plan Costs

Table 10 presents the total enrollment by Medicare-eligibility status and plan enrollment, total claims (cost to plan), total allowed charges (cost to plan plus member and Medicare paid expenses), and calculated cost per enrollee (equal to the claims/charges divided by enrollment). The enrollment figures and costs are broken out for the NMR and MC retirees separately by the Basic and Standard Plans. These figures are the yearly averages used by the administrator in reports to the SHP.[26]

[Table 10]

In Table 10, we see that between fiscal year 2010 (July 2009 – June 2010) and fiscal year 2011 (July 2010 – June 2011) there was a marked increase in costs among the NMR in both plans in terms of both the costs to the plan and the total charges. This should be expected if the least expensive members of the Standard Plan shifted to the Basic Plan, causing the per-enrollee costs to rise in each plan (see Cutler and Reber, 1998 for a description of insurance unraveling). However, when considering the average cost of providing RHI to NMR, we see a much more modest rise of about 5 percent. Using the National Health Expenditure Data, Hartman, et al. (2013) report that

[26] Note that the SHP data include only the explicit cost of retiree health insurance. By including retirees and their dependents in the risk pool, the cost of active worker health insurance rises (see Clark and Morrill, 2010). However, since the plan is self-insured, the "implicit" subsidy of pooling is not relevant for total costs of SHP which includes both active and retired employees. GASB standards require that the implicit subsidy be consider as a cost of RHI and must be reflected in the calculation of the accrued liabilities of the retiree health plan. However, on an annual cost basis, the lower cost of premiums for retirees is offset by a higher cost for active employees.

nationally, health consumption expenditures rose by exactly 3.9 percent in 2009, 2010, and 2011 (i.e., costs rose 11.7 percent between the beginning of 2009 and the end of 2011). If we consider the MCR as a control group in this first time period, we notice a much smaller growth in the cost to the plan among that group, approximately 1 percent. Interestingly, the total allowed charges rose by a similar 4 percent. So, somewhat surprisingly, it appears that the cost growth for NMR was actually larger than for the MCR. This does not necessarily imply that the CWI increased costs relative to what they would have been, but it does not suggest any large moderation in cost growth.

Considering the second fiscal year difference, July 2010-June 2011 versus July 2011-June 2012, we observe the blended effects of the implementation of CWI-II, the repeal of CWI-I and CWI-II, and the premium. Here we see that the SHP plan costs dropped slightly for NMR and by 8 percent for MCR. Interestingly, the total allowed charges rose by 6 percent among NMR and declined by 6 percent among MCR.

At this time, the growth in Medicare spending per enrollee was 4.3%, 1.8%, and 3.6% in 2009, 2010, and 2011, respectively (Hartman et al, 2013), or approximately 10% between 2009 and 2011. Thus, compared with national trends, the CWI did not appear to reduce costs for RHI and may have even lead to larger increases than would have been experienced in the absence of plan modifications. This is similar to the findings of insurance market unraveling in Cutler and Reber (1998), where when individuals on the margin are shifted into a less generous plan, the costs actually rise in both plans due to adverse selection. However, without a true control group, it is difficult to assess how the plan modifications changed costs.

To explore this further, Figure 4 plots historical data from 1991 through 2012, where available, for Medicare expenditures and Medicare costs per enrollee (in North

Carolina and in the United States on average). We then include historical cost information on the SHP per enrollee expenditure. These data are slightly different than that presented in Table 10, in order to develop a historical trend line. These figures include paid medical claims for retirees only (no dependents). From 1991-2006 the data include paid pharmacy claims for retirees only, while the 2009-2012 figures include pharmacy claims for dependents as well. The year here is the fiscal year ending in June (so 2009 corresponds to July 2008-June 2009). The data for 2007 and 2008 were not available as the SHP did not make a report to the legislature in those years. The estimates are for per enrollee expenditures on medical claims, net of Medicare reimbursements and out-of-pocket amounts and gross of refunds.

[Figure 4]

Figure 4 illustrates a steady rise in medical spending over the past two decades. The cost growth in the SHP is approximately equal to the growth in Medicare spending, with the exception of the most recent years. We see here that the rise between 2009 and 2011 and the decline in 2012 was very slight compared with earlier trends. In this figure it appears that during the time period under investigation in this study, the SHP costs grew at a lower rate than what would have been expected from either the historical trend or the cost growth in Medicare. As shown below, we believe this is attributable to the increases in out-of-pocket costs and the introduction of the premium, not the CWI.

On the whole, the large shifts in plan choice among NMR associated with CWI-I, and the more moderate shifts due to the repeal of CWI and the introduction of the premium, did not lead to a clear and unambiguous decline in the cost of providing RHI. We next consider how the actuarially accrued liabilities associated with RHI were affected by the plan modifications.

IV.B. RHI Unfunded Liabilities

Until recently, the liabilities associated with extending subsidized access to the SHP to retirees were not well understood or clearly quantified.[27] In 2004, the Governmental Accounting Standards Board issued statements that required public employers to prepare actuarial statements that reported the actuarial accrued liabilities (AAL) of retiree health plans. The first such statement in North Carolina was prepared by Aon Consulting in December of 2006 covering the plan as of December 31, 2005. The actuarial statement indicated the AAL was $23.9 billion and that the state had assets of only $139 million in reserve. Thus, the state had unfunded actuarial accrued liabilities (UAAL) of $23.8 billion in 2005. Subsequent reports covering the years 2007-2011 show a rise in the UAAL to $29.6 billion in 2011, an increase in 6 years of $5.8 billion (24 percent).

[Table 11]

The actuarial statements are based on current law, projections of future employment and the number of retirees, and the health care cost trend rate. Unlike pensions, which have a legislated formula that determines generosity, the actual health plan offered to retirees can be modified within certain limitations established by case law. Table 11 shows the projected liability in each valuation to date, as well as the

[27] Clark and Morrill (2010) discuss the GASB requirements and present evidence from these actuarial reports for all 50 states. Similar analysis can be found in Pew Center on the States (2010). Clark (2010) presents similar data focusing on retiree health plans for public school teachers. Additional discussion of retiree health plans and their financial status is provided in Clark (2009).

primary reasons for any change in the projected liability.[28] Notice that the projected liabilities are most affected by out-of-pocket increases and actuarial assumptions, and that the CWI did not seem to impact the UAAL at all.

Although the state maintains a small trust fund for retiree health, the annual cost of premiums for retired workers is paid primarily by annual appropriations. The annual cost of providing coverage to retirees has increased rapidly over the past three decades. In 1984, premiums for retirees were $23.3 million. By 1990, state expenditures had increased to $70.8 million, and by 2000 the employer cost of premiums for retirees reached $192.0 million. Annual costs have more than tripled in the last decade and in 2010 totaled $616.0 million. Using inflation adjusted dollars (1982-84 = 100), the annual state expenditures rose from $22.4 million in 1984 to $282.2 million in 2010. The rate of increase in the annual cost of retiree health insurance has outpaced the growth of the state budget. As a result, the proportion of the state budget devoted to retiree health insurance has increased from 0.65 percent in 1995 to 1.33 percent in 2010, roughly a 105 percent increase in the proportion of the state budget allocated to retiree health insurance over those 15 years. The UAAL as a percent of payroll has risen from 192.4 percent in 2005 to 216.5 percent in 2009. The actuarial statements report the annual required contribution (ARC), which is the normal cost of the plan plus contributions needed to amortize the UAAL over 30 years. The ARC has increased from $2.4 billion in 2005 to $3.0 billion in 2009. This represents an increase in the ARC as a percentage of state payroll from 19.3 to 19.9 percent. From 2005-2009, the state paid slightly more than the annual cost for current retirees but had not attempted to reduce

[28] These figures are either explicitly provided in the reports or were provided by the actuaries preparing the reports in publicly available presentations.

the UAAL by making the annual required contribution necessary to move toward full funding of the plan, which is one cause of the increase in the UAAL.[29]

IV.C. The Affordable Care Act

Like all employer-provided health insurance plans, the SHP has already been affected by the Affordable Care Act (ACA) and will be affected in the coming years. Short-term impacts of these changes in North Carolina are estimated have only minor cost implications. The expansion of dependent coverage up to age 26 is estimated to increase annual expenditures by the SHP by $15 to $20 million.[30] Changes in the use of pre-existing condition clauses and the elimination of lifetime caps on individual claims are expected to have only negligible effects on annual expenditures. It should be noted that these changes are unlikely to affect North Carolina's SHP because it already did not subsidize dependent coverage and did not have lifetime caps.

The Early Retiree Reinsurance Program provision of the Affordable Care Act provides subsidies to employers who offer retiree health insurance to former employees between the ages of 55 and 65. This program has already used all appropriated funds but provided approximately $70 million of revenue to the SHP. The state will also need to make a decision on whether it wishes to retain "grandfather status" of the SHP. Retaining this designation exempts the SHP from some aspects of the Affordable Care

[29] Clark (2009) compares the liabilities across states for general state employees while Clark (2010) examines retiree health liabilities associated with providing this benefit to public school teachers.

[30] Estimates were provided by plan actuaries and can be found in the following presentation made to the Board of Trustees: http://statehealthplan.state.nc.us/library/pdf/board-materials/April-2011/updated-actuarial-forecast.pdf, [accessed June 26, 2013].

Act but limits possible changes to the plan.[31] Longer-term cost implications will be determined by the insurance exchanges that are established and whether state employees or retirees migrate from the SHP to one of the exchanges. In addition, costs will be influenced by whether federal law ultimately requires the state to provide a specified level of health benefits that exceed the current levels offered by the SHP.

V. Discussion and Conclusions

The cost of providing health insurance for retired public workers continues to increase rapidly and has been in excess of the inflation rate, the rate of growth of payroll, and the rate of growth of state revenues in North Carolina. This fiscal pressure on state finances has occurred despite changes in the SHP that have reduced annual costs. Unfunded liabilities associated with health insurance for retirees are also rising because North Carolina, like many states, has financed its plan using pay-as-you-go funding. Therefore accrued liabilities continue to grow without any corresponding increase in funds to pay for these promised benefits.[32]

One method employers have adopted to moderate the increase in the cost health insurance is to provide incentives or penalties in an effort to move employees and retirees into plans that have lower employer costs. This study examines the impact of policy changes in the North Carolina State Health Plan on the plan choices of retirees. The state introduced two wellness initiatives that required smokers and then overweight

[31] For a discussion of the pros and cons of retaining grandfathering status see, SHP *Limits on Benefit Changes,* 2010a, 2010b, 2010c.

[32] It should be noted that in North Carolina collective bargaining by public employees is not allowed by law, so there are no powerful union interests that might hinder the state from adjusting employee benefits.

retirees who were not yet eligible for Medicare to move to a less generous plan which had lower employer costs. The adoption of these CWIs resulted in about one third of all such retirees moving immediately from the Standard to the Basic plan. At the same time, Medicare eligible retirees, who were not covered by the CWIs, had only a small increase in enrollment in the Basic plan. Thus, it seems reasonable to conclude that the policy initiatives successful achieved their primary objective of moving less healthy, higher cost retirees into the less generous plan.

Shortly after the introduction of the second CWI, North Carolina repealed both of the CWIs and instituted a premium on the Standard plan. After the implementation of these two policies, the total enrollment in the Basic plan remained relatively constant; however, we observed considerable movement from the Standard to the Basic plan as some retirees shifted plans to avoid the new premium and from the Basic to the Standard plan as many of those who were required to move to the Basic plan shifted back to the Standard plan. The evidence seems to clearly suggest that retirees are sensitive to policy changes such as wellness requirements and premiums.

Despite this substantial behavioral response to the plan modifications, the implications for costs were relatively modest. Under CWI-I costs rose for both the NMR and the MCR, although the evidence suggests that this growth may have been less than what would have been expected given historical trends and trends in Medicare spending. When considering the unfunded actuarially accrued liabilities (UAAL) associated RHI in North Carolina, we see that the most significant factors were assumptions about trends and increases in retiree-paid premiums. The CWI had very little impact on the UAAL calculations.

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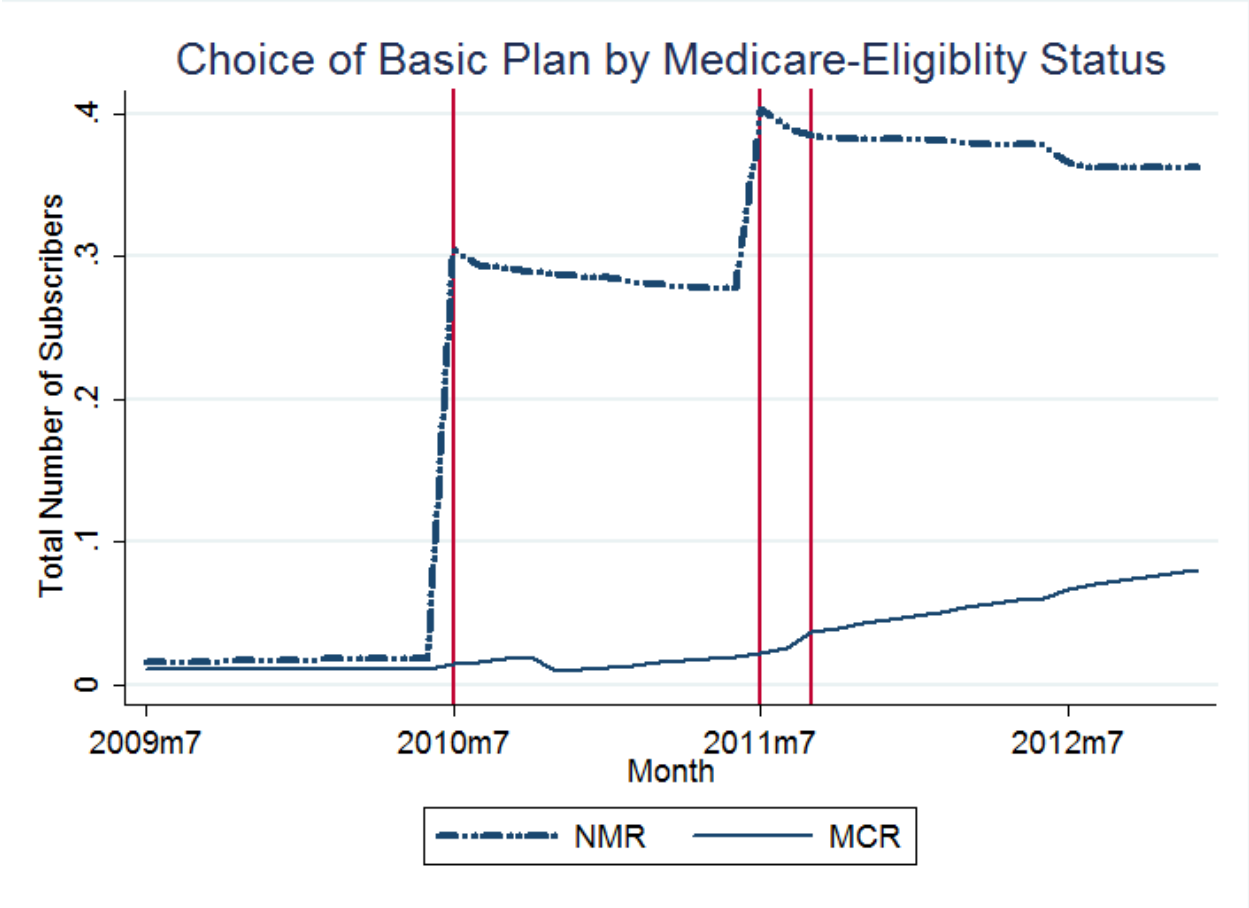
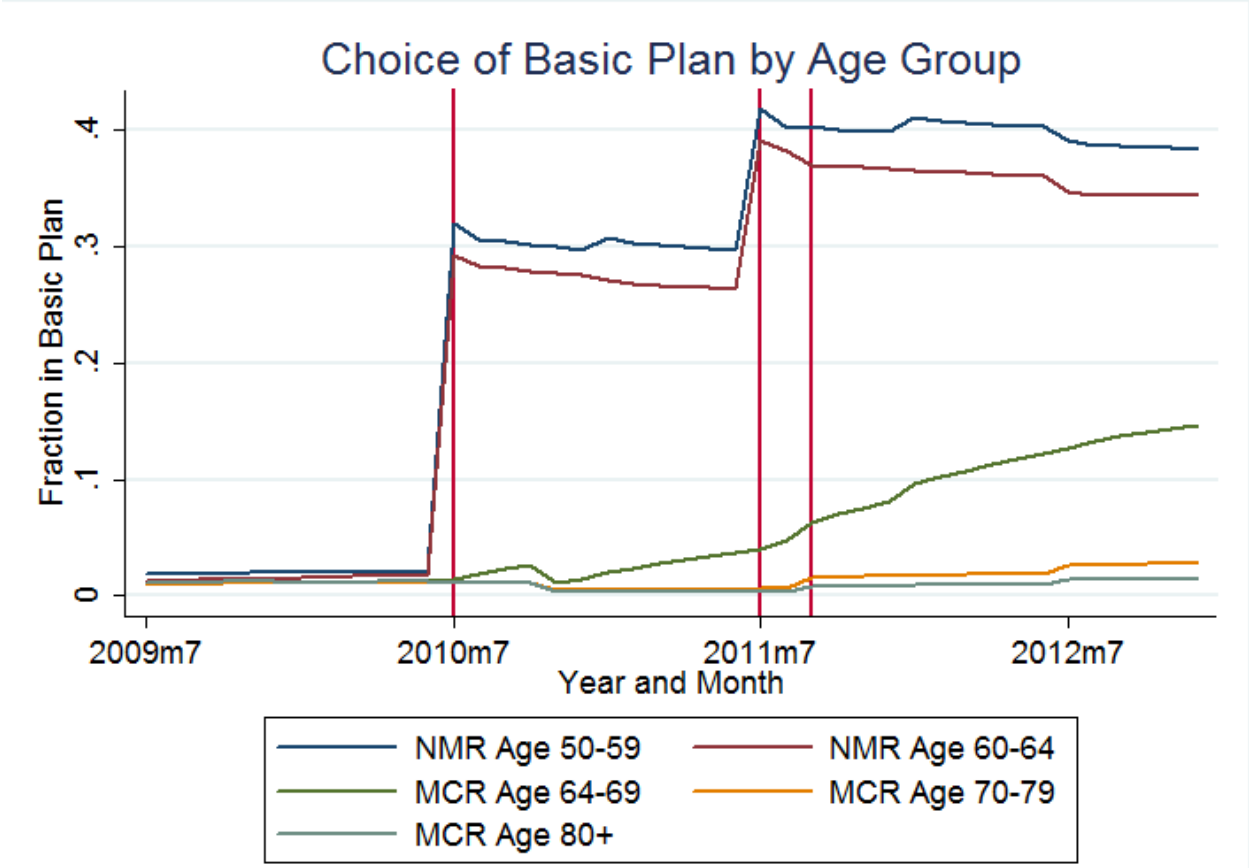


Figure 1: Plan Choices in Each Month from July 2009 – December 2012



Notes: The data only include year of birth, so age is measured as of January 1st of the given year. In these data, a 64-year-old is grouped based on Medicare-eligibility status. A small number of 64-year-olds may qualify for Medicare due to disability, and so may not have reached age 65 by the observation month. MCR younger than 64 are excluded from this graph.

Figure 2: Plan Choices by Age Group

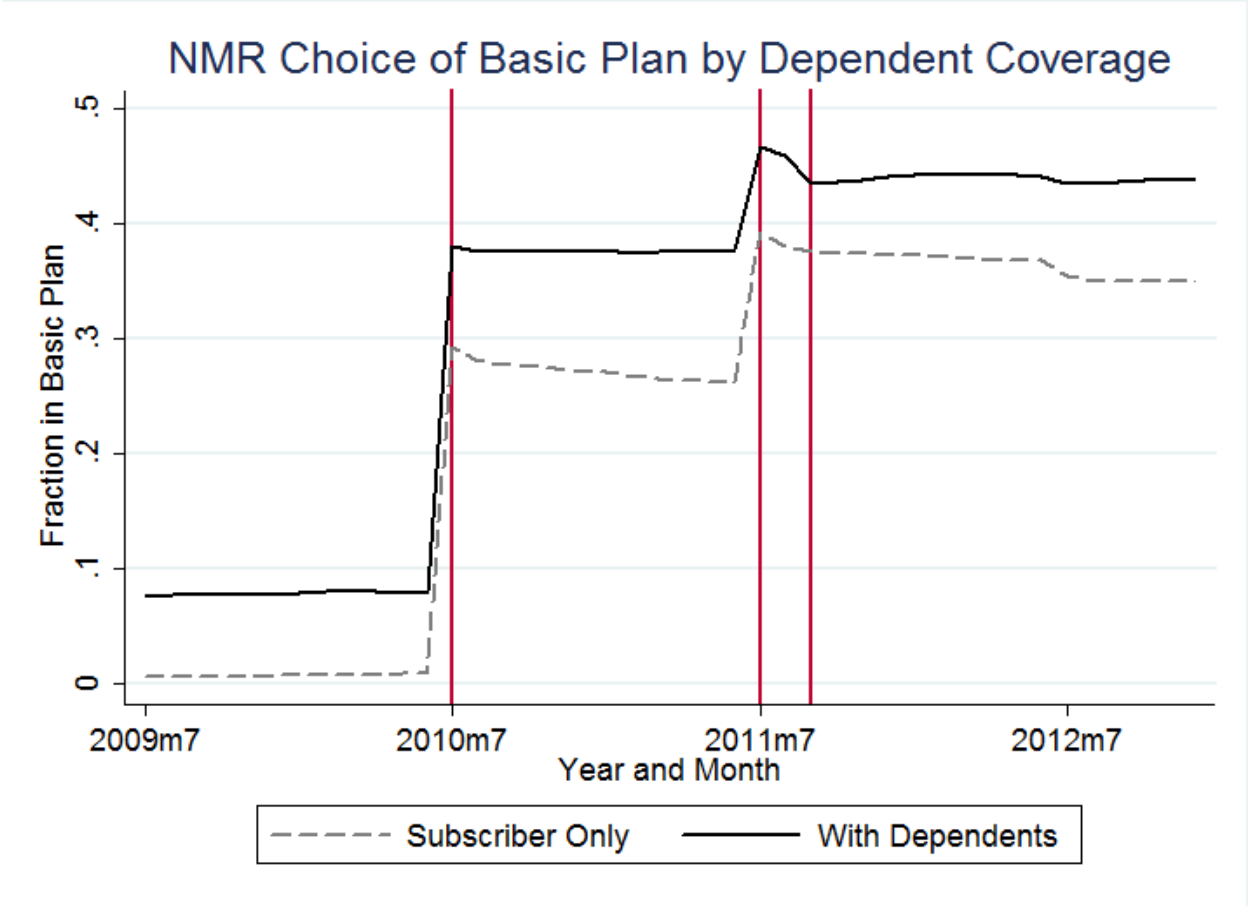
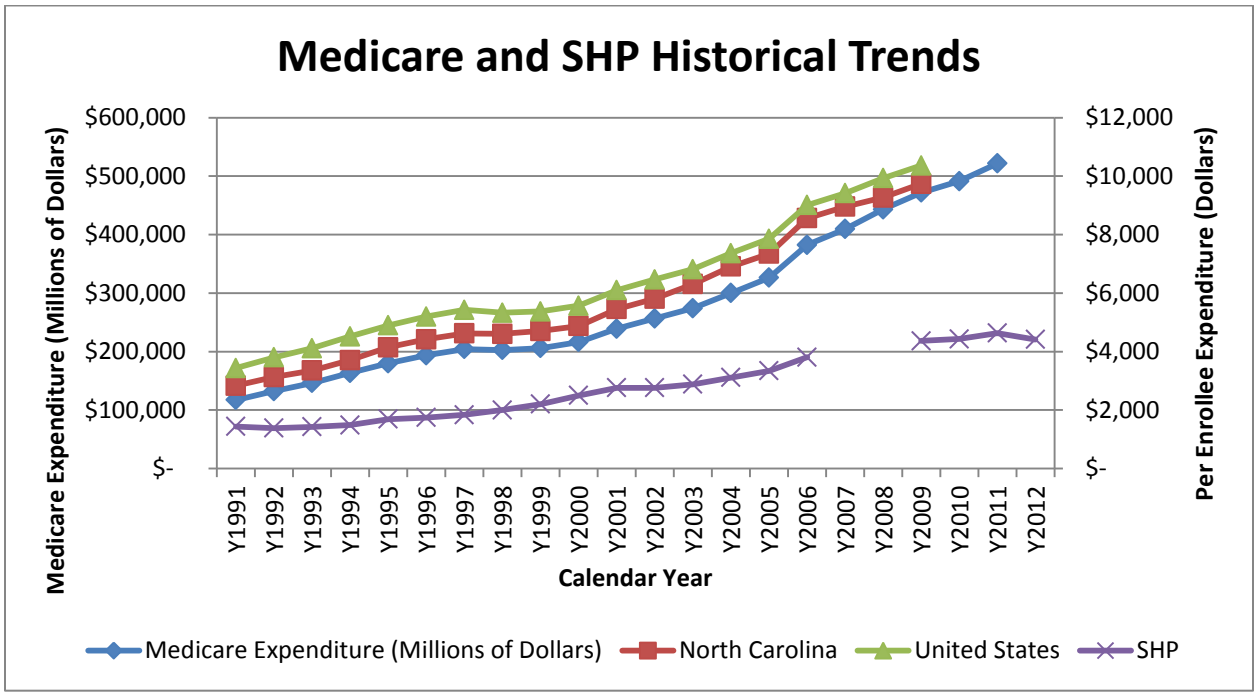


Figure 3: NMR Plan Choices by Dependent Coverage



Notes: The Medicare expenditure data is from the National Health Expenditures by type of service and source of funds, CY 1960-2011 file. Retrieved (July 9, 2013) at http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/NHE2011.zip. The North Carolina and United States per enrollee expenditures are calculated from the Centers for Medicare & Medicaid Services (2011). Health Expenditures by State of Residence. Retrieved (July 9, 2013) at http://www.cms.gov/NationalHealthExpendData/downloads/resident-state-estimates.zip . The State Health Plan historical claims data are from records kept by the Legislative Analyst Office based on reports from the SHP to the legislature. These figures include paid medical claims for retirees only (no dependents). From 1991-2006 the data include paid pharmacy claims for retirees only, while the 2000-2012 figures include pharmacy claims for dependents as well. The estimates are for per enrollee expenditures on medical claims, net of Medicare reimbursements and out-of-pocket amounts and gross of refunds.

Figure 4: Historical Medical Care Spending Levels

Table 1: Premiums for Retiree Health Insurance Coverage

		Non-Medicare Retiree Self Only		Medicare Retiree Self Only		Non-Medicare Retiree and Spouse		Employee and Spouse both with Medicare	
		Employer	Retiree	Employer	Retiree	Employer	Retiree	Employer	Retiree
July 2009	Standard	$377.22	0	$287.20	0	$377.22	$502.74	$287.20	$375.32
	Basic	$377.22	0	$287.20	0	$377.22	$422.74	$287.20	$315.10
July 2010	Standard	$410.80	0	$312.76	0	$410.80	$547.48	$312.76	$408.72
	Basic	$410.80	0	$312.76	0	$410.80	$460.36	$312.76	$343.14
July 2011	Standard	$410.80	0	$312.76	0	$410.80	$547.48	$312.76	$408.72
	Basic	$410.80	0	$312.76	0	$410.80	$460.36	$312.76	$343.14
September 2011	Standard	$410.94	$21.62	$320.64	$10.00	$410.94	$576.42	$320.64	$440.32
	Basic	$410.94	0	$320.64	0	$410.94	$484.70	$320.64	$351.90
July 2012	Standard	$432.66	$22.76	$336.25	$10.52	$432.66	$629.64[a]	$336.25	$463.58[a]
	Basic	$432.66	0	$336.25	0	$432.66	$510.32[b]	$336.25	$370.50[b]

[a] Total monthly premium with traditional Rx Plan for both self and dependent

[b] Traditional Rx Plan, not Medicare Part D Plan

Notes: The standard plan is the 80/20 and the Basic Plan is the 70/30. This is a subset of possible combinations of coverage, but includes the most common options.

Table 2: Other Plan Design Features for Retiree Health Insurance Coverage

	Jul, 2009 through Aug, 2011		Sep, 2011 through Jun, 2013	
	Basic 70/30 (1a)	Standard 80/20 (1b)	Basic 70/30 (2a)	Standard 80/20 (2b)
Plan Design Feature				
Primary Care Copay	$30	$25	$35	$30
Specialist Copay	$70	$60	$81	$70
Physical/ Occupational/ Speech Therapy, Mental Health, and Chiropractic Copay	$55	$45	$64	$52
Inpatient Copay	$250	$200	$291	$233
Deductible (Individual/Family)	$800/$2,400	$600/$1,800	$933/$2,799	$700/$2,100
Coinsurance Percentage	30%	20%	30%	20%
Coinsurance Maximum (Individual /Family)	$3,250/$9,750	$2,750/$8,250	$3,793/$11,379	$3,210/$9,630

Notes: All amounts are for services provided in network. Pharmacy copays are not shown because they are the same across the two plans. Deductible and coinsurance applies to inpatient and outpatient hospital and ambulatory surgery centers.

Table 3: State Health Plan Terms and Policies

Date	Default	Major Change	Other Changes
July 2009	Previous Plan (Standard Plan if previously in Premium Plan)	Eliminated Premium Plan	Increased annual deductibles, copayments, and out-of-pocket maximums. Premium increase by 8.9% on plans with premiums.
July 2010	Basic Plan	CWI-I Tobacco Cessation (NMR only)	Approximately 8.9% premium increase on plans with premiums.
July 2011	Basic Plan	CWI-II Weight Management Added (NMR only)	(1) ACA Coverage of Dependents 19-26 (2) No pre-existing condition waiting period if younger than 19 years old.
September 2011	Previous plan	(1) CWI Repealed; (2) Introduced Employee Premium on Standard Plan	Most copayments, plus deductibles and coinsurance maximums increased by approx. 16% relative to July 2011. Premium increase by 5.3% on plans with premiums.
July 2012	Previous plan	No major change	Approximately 5% premium increase on plans with premiums.

Table 4: Sample Descriptive Statistics

	All Retirees	Non-Medicare Retirees (NMR)	Medicare-Eligible Retirees (MCR)
	(1)	(2)	(3)
Observations	6,446,033	2,122,969	4,323,064
Basic Plan	10.5%	25.3%	3.3%
Covers Dependents	9.9%	13.9%	8.0%
Medicare-Eligible	67.1%		
Male	33.0%	31.6%	33.7%
Age 50-59	16.6%	43.5%	3.3%
Age 60-63	18.4%	50.3%	2.8%
Age 64-65	9.8%	6.1%	11.6%
Age 66-69	17.0%		25.3%
Age 70-79	27.1%		40.4%
Age 80+	11.1%		16.6%
	Percent Choosing Basic Plan		
July 2009: Baseline	1.28%	1.58%	1.13%
July 2010: CWI-I	11.16%	30.44%	1.48%
July 2011: CWI-II	14.75%	40.32%	2.24%
Sept. 2011: Repeal CWI, Premium	15.33%	38.46%	3.74%
July 2012: Premium Increase	16.06%	36.55%	6.77%
Dec. 2012: End of Sample	16.75%	36.19%	8.03%

Notes: The sample is all subscribers who are receiving benefits as a Medicare-eligible (MR) or non-Medicare eligible (NMR) and who are at least age 50 as of January 1 of the observation year. The sample is an unbalanced panel of plan choice in each month between July 2009 and December 2012. Age refers to age on January 1 of the given year (approximated from year of birth).

Table 5: Choice of Basic Plan

	All Retirees		Non-Medicare Retirees (NMR)		Medicare Eligible Retirees (MCR)	
	(1)	(2)	(3)	(4)	(5)	(6)
CWI-I	0.089	0.091	0.291	0.292	-0.015	-0.004
(July 2010-June 2011)	(0.001)	(0.0004)	(0.001)	(0.001)	(0.0004)	(0.0002)
CWI-II	0.126	0.130	0.422	0.426	-0.024	-0.009
(July 2011-Aug. 2011)	(0.001)	(0.001)	(0.003)	(0.002)	(0.001)	(0.0004)
Repeal CWI, Premium	0.132	0.137	0.412	0.421	-0.010	0.002
(Sept. 2011-Apr. 2013)	(0.001)	(0.001)	(0.003)	(0.002)	(0.001)	(0.0004)
Covers Dependents	0.066	0.051	0.076	0.075	0.053	0.024
	(0.0004)	(0.001)	(0.001)	(0.002)	(0.0003)	(0.001)
Male	0.029		0.076		0.011	-0.001
	(0.0002)		(0.001)		(0.0002)	(0.002)
Age 50-59					0.048	-0.023
					(0.0005)	(0.001)
Age 60-63	-0.010	0.117	-0.023	-0.018	0.043	-0.015
	(0.0004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age 64-65	-0.078	0.188	-0.019	-0.024	0.112	-0.002
	(0.0004)	(0.001)	(0.001)	(0.001)	(0.0003)	(0.0002)
Age 66-69	-0.213	0.122				
	(0.0004)	(0.001)				
Age 70-79	-0.221	0.053			-0.009	0.002
	(0.0003)	(0.001)			(0.0002)	(0.0002)
Age 80+	-0.226	-0.021			-0.013	-0.001
	(0.0004)	(0.001)			(0.0003)	(0.0004)
Subscriber FE		X		X		X
Observations (Subscriber-Months)	6,446,033		2,122,969		4,323,064	
Mean Dep. Var.	10.5%		25.3%		3.3%	

Notes: The dependent variable is the choice of the basic plan. Coefficients are estimated by a linear probability model with standard errors in parentheses. The sample is all subscribers who are receiving benefits as a non-Medicare eligible retiree (NMR) or Medicare-eligible retiree (MCR) and who are at least age 50 as of January 1 of the observation year. The sample is an unbalanced panel of plan choice in each month between July 2009 and December 2012. The omitted groups are the period from July 2009-June 2010 (baseline) and the age categories columns (1)-(4) ages 50-59, columns (5)-(6) ages 66-69. The even numbered columns include individual fixed effects. All specifications include month and year fixed effects, not reported.

Table 6: Choice of Basic Plan by Whether Covering Dependents in Current Year

	Non-Medicare Retirees		Medicare Eligible Retirees	
	Dependents	Self Only	Dependents	Self Only
	(1)	(2)	(3)	(4)
CWI-I	0.310	0.290	0.002	-0.005
(July 2010-June 2011)	(0.002)	(0.001)	(0.001)	(0.0002)
CWI-II	0.405	0.431	-0.002	-0.009
(July 2011-Aug. 2011)	(0.005)	(0.002)	(0.001)	(0.0004)
Repeal CWI, Premium	0.382	0.430	0.005	0.001
(Sept. 2011-Apr. 2013)	(0.004)	(0.002)	(0.001)	(0.0004)
Age 50-59			-0.020	-0.023
			(0.003)	(0.001)
Age 60-63	-0.007	-0.021	-0.001	-0.017
	(0.002)	(0.001)	(0.002)	(0.001)
Age 64-65	-0.045	-0.024	-0.003	-0.002
	(0.004)	(0.002)	(0.001)	(0.000)
Age 70-79			0.001	0.003
			(0.001)	(0.000)
Age 80+			-0.002	-0.001
			(0.001)	(0.000)
Observations	294,082	1,828,887	344,013	3,979,051
Percent in Basic Plan	32.04%	24.21%	8.60%	2.84%

Notes: Column (1) – (2) have an identical specification and sample to Table 5 column (4); column (3)-(4) have an identical specification and sample to Table 5 column (6). The dependent variable is the choice of the basic plan. Coefficients are estimated by a linear probability model with standard errors in parentheses. The sample is all subscribers who are receiving benefits as a Medicare-eligible (MR) or non-Medicare eligible (NMR) and who are at least age 50 as of January 1 of the observation year.

Table 7: Choice of Basic Plan for Newly Retired and Newly Medicare Eligible

	First Month Retired		First Month Medicare-Eligible
	NMR	MCR	$MCR_t \mid NMR_{t-1}$
	(1)	(2)	(3)
CWI-I	0.096	-0.014	0.251
(July 2010-June 2011)	(0.011)	(0.017)	(0.014)
CWI-II	0.142	-0.050	0.340
(July 2011-Aug. 2011)	(0.019)	(0.031)	(0.026)
Repeal CWI, Premium	0.217	0.066	0.376
(Sept. 2011-Apr. 2013)	(0.020)	(0.031)	(0.024)
Covers Dependents	0.115	0.062	0.018
	(0.006)	(0.012)	(0.009)
Male	0.054	0.024	0.070
	(0.004)	(0.007)	(0.006)
Age 50-59		-0.009	
		(0.017)	
Age 60-63	-0.005	0.070	
	(0.004)	(0.028)	
Age 64-65	-0.037	0.026	
	(0.011)	(0.008)	
Age 70-79		-0.010	
		(0.010)	
Age 80+		-0.079	
		(0.016)	
Observations	33,869	9,796	23,064
Mean Dep. Var.	17.4%	12.9%	25.3%

Notes: The dependent variable is an indicator for whether the retiree chose the Basic Plan in the first month of being newly retired or being newly eligible for Medicare. The specifications include month and year fixed effects, not reported. Coefficients are estimated by a linear probability model with standard errors in parentheses. In Column (1) the sample is all NMR in the first month observed as a NMR (omitting July 2009), while Column (2) includes retirees that first appear as MCR (omitting July 2009). In Columns (3) the sample is restricted to individuals ages 64-65 in the first month after a transition from NMR to MCR.

Table 8: Probability of Transitioning

	CWI		Repeal CWI + Add Premium	
	CWI-I: Standard to Basic	CWI-II: Standard to Basic	Standard to Basic	Basic to Standard
	June-July 2010	June-July 2011	Aug.- Sept. 2011	Aug.-Sept. 2011
	(1)	(2)	(3)	(4)
Panel A: Non-Medicare Eligible Retirees (NMR)				
Covers Dependents	0.037	-0.047	-0.045	-0.041
	(0.006)	(0.007)	(0.005)	(0.007)
Male	0.091	0.042	0.011	-0.053
	(0.004)	(0.005)	(0.004)	(0.005)
Age 60-63	-0.026	-0.005	-0.018	0.017
	(0.004)	(0.005)	(0.003)	(0.005)
Age 64-65	-0.008	0.003	-0.036	0.016
	(0.010)	(0.009)	(0.008)	(0.012)
Observations	47,367	36,180	31,737	20,336
Mean of Dep. Var.	29.7%	24.4%	8.5%	14.4%
Panel B: Medicare-Eligible Retirees (MCR)				
Covers Dependents	0.005	0.001	-0.001	
	(0.001)	(0.001)	(0.001)	
Male	0.003	0.000	0.004	
	(0.000)	(0.000)	(0.001)	
Age 50-59	0.032	0.018	0.000	
	(0.001)	(0.001)	(0.002)	
Age 60-63	0.030	0.011	-0.002	
	(0.001)	(0.001)	(0.002)	
Age 64-65	0.005	0.011	0.009	
	(0.001)	(0.001)	(0.001)	
Age 70-79	0.000	0.000	-0.003	
	(0.000)	(0.000)	(0.001)	
Age 80+	-0.001	-0.001	-0.008	
	(0.001)	(0.000)	(0.001)	
Observations	95,598	100,575	101,852	
Mean of Dep. Var.	0.3%	0.2%	1.2%	

Notes: The sample is subscribers who did not change status (NMR versus MCR) in the two-month period. In Part A the omitted age group is Ages 50-59; in Part B the omitted age group is Ages 66-69. The dependent variable is the change between plans, as indicated in the column headings. Coefficients are estimated by a linear probability model with standard errors in parentheses.

Table 9: Effects of Plan Modifications on Retirement Status and Choice to Cover Dependents

	Dependent Variable: Retired Sample: All subscribers (active and retired) ages 50-69			**Dependent Variable: Cover Dependents** Sample: All retired subscribers ages 50+	
	All Subscribers	Covers Dependents	Self Only	Non-Medicare Retirees	Medicare Eligible Retirees
	(1)	(2)	(3)	(4)	(5)
CWI-I	-0.001	-0.001	-0.001	-0.001	-0.001
(July 2010-June 2011)	(0.0003)	(0.001)	(0.0003)	(0.0004)	(0.0002)
CWI-II	-0.001	-0.0003	-0.001	0.002	-0.001
(July 2011-Aug. 2011)	(0.001)	(0.001)	(0.001)	(0.001)	(0.0004)
Repeal CWI, Premium	0.0001	-0.0004	0.0005	0.002	-0.001
(Sept. 2011-Apr. 2013)	(0.0005)	(0.001)	(0.001)	(0.001)	(0.0003)
Age 50-59					0.017
					(0.001)
Age 60-63	0.047	0.036	0.049	0.002	0.017
	(0.0003)	(0.001)	(0.0003)	(0.0004)	(0.001)
Age 64-65	0.075	0.059	0.076	-0.003	0.007
	(0.0005)	(0.001)	(0.001)	(0.001)	(0.0002)
Age 66-69	0.074	0.063	0.073		
	(0.001)	(0.001)	(0.001)		
Age 70-79					-0.001
					(0.0002)
Age 80+					0.003
					(0.0004)
Observations	8,791,158	1,438,649	7,352,509	2,122,969	4,323,064
Mean of Dep. Var.	45.48%	31.81%	48.16%	13.85%	7.96%

Notes: The unit of observation is a subscriber-month. In Columns (1) - (3) the dependent variable is whether the individual is currently retired (MR or NMR) among all subscribers (active or retired) who were age 50-69 on January 1. In Columns (4) – (5), the dependent variable is whether the retiree chose to cover dependents in that month among all subscribers who are receiving benefits as a Medicare-eligible (MR) or non-Medicare eligible (NMR) and who are at least age 50. Coefficients are estimated with a linear probability model. The sample is an unbalanced panel of status in each month between July 2009 and December 2012. Each specification includes subscriber, month, and year fixed effects.

Table 10: Plan Costs

	July 2009-June 2010 Baseline	July 2010-June 2011 CWI-I	July 2011-June 2012 CWI-II, Repeal CWI + Premium
ENROLLMENT			
Standard (80/20) NMR	60,167	44,934	39,759
Basic (70/30) NMR	1,826	19,173	25,470
Standard (80/20) MCR	108,491	112,224	114,863
Basic (70/30) MCR	1,555	2,014	5,725
TOTAL CLAIMS (SHP Plan Expenses)			
Standard (80/20) NMR	$310,519,827	$249,275,811	$223,911,053
Basic (70/30) NMR	$7,234,633	$94,786,396	$123,374,536
Standard (80/20) MCR	$97,286,559	$101,238,143	$96,113,461
Basic (70/30) MCR	$1,098,474	$2,095,173	$4,067,169
TOTAL ALLOWED CHARGES (Member + SHP Expenses + Medicare Payments)			
Standard (80/20) NMR	$373,965,997	$297,872,802	$270,431,623
Basic (70/30) NMR	$8,891,336	$117,265,627	$154,628,457
Standard (80/20) MCR	$958,769,880	$1,025,725,775	$990,181,713
Basic (70/30) MCR	$12,116,447	$19,020,966	$40,113,218
TOTAL CLAIMS PER ENROLLEE (SHP Plan Expenses)			
Standard (80/20) NMR	$5,161	$5,548	$5,632
Basic (70/30) NMR	$3,962	$4,944	$4,844
Average NMR	**$5,126**	**$5,367**	**$5,324**
Standard (80/20) MCR	$897	$902	$837
Basic (70/30) MCR	$706	$1,040	$710
Average MCR	**$894**	**$905**	**$831**
TOTAL ALLOWED CHARGES PER ENROLLEE (Member + SHP Expenses + Medicare Payments)			
Standard (80/20) NMR	$6,215	$6,629	$6,802
Basic (70/30) NMR	$4,869	$6,116	$6,071
Average NMR	**$6,176**	**$6,476**	**$6,516**
Standard (80/20) MCR	$8,837	$9,140	$8,621
Basic (70/30) MCR	$7,792	$9,444	$7,007
Average MCR	**$8,823**	**$9,145**	**$8,544**

Notes: Plan income, enrollment, and costs are calculated from the SHP financial reports. Medical claims are from the BCBSNC monthly claims reports (Report 2) using incurred reported through December (misses about 25 million dollars due to COBRA and local governments) and the enrollment figures are from BCBSNC (Report 12) average enrollment over the fiscal year. The "per enrollee" costs are calculated by the authors by dividing total charges by total enrollment.

Table 11: UAAL RHI

Year	2005 Report	2007 Report	2008 Report	2009 Report	2010 Report	2011 Report
2005	23.786					
2006	25.852					
2007	27.932	28.594				
2008	30.069	30.621	27.854			
2009	32.259	32.707	29.995	32.765		
2010	34.508	34.896	32.132	35.074	32.839	
2011	36.837	37.137	34.214	37.451	35.063	29.610
2012	39.295	39.489	36.324	39.798	37.323	31.391
2013	41.895	41.961	38.427	42.136	39.559	33.156
2014	44.646	44.487	40.555	44.483	41.789	34.912
2015		47.147	42.712	46.855	44.029	36.662
2016			44.910	49.255	46.270	38.416
2017			47.165	51.716	48.541	40.186
2018				54.256	50.897	41.985
2019					53.325	43.823
2020						45.712
Substantive Changes		No trend reset	Out-of-pocket increased; Eliminated Premium Plan	New assumptions from experience study; Trend reset	Out-of-pocket increased; Retiree premiums in Standard Plan	New drug plan (EGWP); Change to Segal methods; No trend reset

Note: UAAL's are expressed in billions of dollars.

Source: Actuarial reports of the postemployment medical plan for retired teachers and state employees of North Carolina, prepared by Aon Hewitt (2005-2010 reports) and The Segal Company (2011 report).