Examining the Whole Picture: Retiree Health Obligations and the Long-Term Budget Outlook for the State and Local Government Sector*

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July 2013

Preliminary and incomplete: Do not cite**

* We thank Anne Burton, Jeff Groesbeck, and Lena Yemelyanov for truly outstanding research assistance. The paper would not have been feasible without them. We thank Robert Novy-Marx and Josh Rauh for generously sharing their pension calculations with us. We also thank the numerous public officials who discussed the details of public sector retiree health care in their state with us. The analysis and conclusions reached in the paper are the author's alone and do not indicate concurrence by the Board of Governors of the Federal Reserve.

** The total U.S. liabilities for state and local government retiree health care reported in this paper are the sum of the liabilities for the 35 states listed on Tables 1 – 5 (these states contain the vast majority of the U.S. population). Future drafts will incorporate liabilities for all 50 states.

I. Introduction

One of the most important concerns facing state and local governments is their long-term fiscal imbalances. While state and local pension obligations have been analyzed in great detail, much less attention has been paid to the costs of the retiree health insurance benefits promised to state and local retirees and workers. Furthermore, there has been only limited analysis of the fiscal condition of the sector as a whole, which may be influenced by population aging and continued rapid growth in health spending in ways that could alleviate or exacerbate the challenges associated with the sector's pension and retiree health obligations.

This paper seeks to begin to fill this void. Our first task is to develop a comprehensive set of projections of the retiree health obligations facing the state and local government sector. We build on past work which has carefully analyzed the present value of retiree health care liabilities for state and local workers (Clark 2010; Clark and Morrill 2010, 2011; Pew 2012) by projecting the annual cash flows which underlie these present values. While such cash flows have been constructed for retiree pension obligations (Novy-Marx and Rauh, 2011, 2013), we are the first to construct them for retiree health insurance. We reverse engineer the cash flows using the information provided in the retiree health care liability reports mandated by the Government Accounting Standards Board (referred to henceforth as the "GASB reports".) Many of our GASB reports cover only state employees and we therefore use supplemental information to gross up these cash flows so that they cover the entire state and local sector. We also develop a methodology to account for new entrants into the state and local government workforce that enables us to project the retiree health and pension obligations on a "current policy" basis, rather than assuming that these programs are terminated for new employees. Our state-specific modeling of retiree health obligations allows us to modify some of the important assumptions—including health care cost inflation, life expectancy, and the discount rate—in order to compare the retiree health obligations across states on a consistent basis.

In addition, we project each state's overall budget, which helps us to put these retiree health obligations in context. We use state-specific population projections from the Census to project state-specific GDP growth, education spending, and Medicaid spending, and fold in Novy-Marx and Rauh's (2013) estimates of pension cash flows.[1] We assume that state and local tax revenue and all other categories of spending rise with state GDP. We are thus able to compare the magnitude and timing of the retiree health obligations to those related to pensions and Medicaid, and also assess whether there may be other changes in state and local spending—for example, lower demand for education spending—that might offset some of the fiscal pressures associated with retiree health insurance.

More broadly, our construction of the long-term budget outlook for the state and local sector allows us to assess the overall importance of demographic change and health care costs on state

[1] We thank Robert Novy-Marx and Josh Rauh for generously sharing their calculations of pension cash flows by state.

and local budgets. Because our basic assumptions in projecting the state budgets hew to those used by the Congressional Budget Office (CBO) in their long-run budget projections, our projections of state and local budgets are directly comparable with theirs, and indeed, can be combined with theirs to present a picture of the long-run fiscal outlook for the government as a whole.

II. Retiree health care obligations

We estimate the annual cash flows for state and local government retiree health care obligations in two primary steps. First, we construct the cash flows for state government employees using detailed information on these liabilities. Second, we scale up the state cash flows to account for liabilities at the local government level. The scaling is based upon the best available information on a state-by-state basis.

State Government Employees

Present Value of Benefits (PVB)

For each state, we collected the 2011 fiscal year report required by GASB statements 43 and 45 which details the liabilities of the state retiree health insurance plan.[2] These reports generally provide enough detail to construct a reasonable projection of the cash flows of the retiree health plan. Specifically, for each state we collect the following 12 data objects: (1) the age distribution of current retirees by gender, (2) the age and years of service matrix for the current workforce, (3-5) expected rates of turnover, disability, and death by age and gender, (6-7) matrices for retirement and quit/termination probabilities by age, years of service and gender, (8) the eligibility requirements for retiree health insurance, (9) take up rates for retiree health insurance, (10-11) employer and retiree costs for retiree health insurance by age and gender, and (12) the assumed health care cost inflation rate. For many states, some of this information, particularly on retirement and other termination rates, was available only in the Comprehensive Annual Financial Reports (CAFRs) for the state employee pension plans rather than in the GASB reports directly. In other states, some of the necessary information was not included in either the pension or retiree health report, including data elements such as the age distribution or gender mix of current retirees or current workers; for these states, we used information from supplemental sources or information from an adjacent state with a similar retiree health plan.

We use this information to construct the present value of benefits (PVB) cash flows. The PVB is a liability measure which includes both obligations already accrued, as well as obligations associated with the future service of current employees (who are assumed to retiree according to actuarial assumptions). The methodology used to construct these cash flows is straightforward. For current retirees, we simply use the mortality tables to age the population each year, and use

[2] In some cases we obtained the 2012 report or the 2010 report. In these cases we adjust our cash flow estimates to place them on a 2011 fiscal year basis.

the information on current employer retiree health insurance costs, cost sharing and expected medical inflation to calculate the state government cost for all surviving retirees over time. For current workers, the procedure is considerably more cumbersome in practice but not more difficult conceptually. We age the workforce each year (incrementing years of service as well as age) and use the probabilities of retirement, disability, death, and quits/termination by age and years of service to create a matrix of newly-retired workers by year. We then used information on take-up rates, cost sharing, and health cost inflation to calculate the retiree health obligations for future retirees by year.

Actuarially Accrued Liabilities (AAL)

We also calculate cash flows for the Actuarially Accrued Liability (AAL), which is simply the present value of the retiree health obligations that have already been accrued by current workers and retirees. GASB allows states and localities to use a variety of methods to calculate the AAL, the two most common being the Projected Unit Credit (PUC) method and the Entry Age Normal (EAN) method. We calculate both concepts for each state. Under the PUC method, the share of benefits already accrued is equal to the ratio of the years of service already completed to the years of service that will be completed by retirement.[3] The EAN method is based on the idea that employers invest a fixed fraction of an employee's compensation each year so that the retiree health benefits will be fully funded at the time of retirement; the rate at which the benefits are funded thus depends on both the rate of salary growth as well as the discount rate. Under the EAN method, the AAL is simply the value of such an account at any given time. As we explain below, we use these AALs primarily as a check on the accuracy of our cash flows and to compare the financial burden of retiree health benefits to those of pension benefits, rather than as a measure of any sort of termination liability. Unlike the case of pension benefits, state and local governments have little to no legal obligation to continue to provide retiree health benefits, and thus state and local workers and retirees general have very limited legal entitlements to retiree health insurance (Clark 2009). There are numerous ways in which states could terminate or curtail their retiree health insurance liabilities, and thus the "accrued" liabilities do not represent any sort of minimum financial obligation.

Calibration

Our cash flows inevitably contain some error, primarily due to incomplete data in many of the reports which required the use of assumptions or data from neighboring states. For instance, in some states retirees can choose between several different health insurance plans. The GASB reports, however, do not always provide information on the percent of retirees choosing a given

[3] States differ in how they define the years of service at retirement—some states base it on the years of service that will have been completed at the time a worker is first eligible to retire with benefits, whereas others base it on years that will have been completed when the employee actually retires. When replicating the states' calculations for purposes of calibration, we use whichever method the state specified.

plan and we are forced to make assumptions about the percentages. To address this and other sources of error, we compare the present value of our projected cash flows to the present value for these flows given in the GASB report. We then calibrate our projected cash flows such that we match the stated present value calculated with the state chosen discount rate. Following Novy-Marx and Rauh (2009, 2011) we calibrate using a geometric series that starts at one:

$$C_t^{cal,m} = C_t^m * (1 + \lambda^m)^{t-1}$$

where C^m_t is our cash flow estimate, $C_t^{cal,m}$ is the calibrated cash flow estimate, *t* indexes year and *m* indexes the three actuarial methodologies underlying the cash flows: PVB, EAN and PUC. The calibration uses state-level variation in stated present values to proxy for unobserved variation in other variables, holding constant the year *t* liabilities. The geometric series is appealing because it implicitly assumes that any errors due to unobserved data accumulate and intensify over time—a possibility we view as likely.

We calibrate out retiree and active cash flow streams separately. All states report a present value for either the EAN or PUC methodology. Some states provide the PVB present value, others do not. When available, we calibrate directly to the stated present value based on the methodology upon which the cash flow is based — i.e. we calibrate the PVB stream to the stated PVB present value. When the report does not contain the present value corresponding to the methodology underlying our cash flow, we use the EAN or PUC calibration factor (which is provided in the report).

We calculate the calibration factors using state chosen values for medical cost inflation, mortality and other projections. Once we have generated the calibration factors, however, we can produce alternative cash flows based on different underlying assumptions, by recalculating the retiree health obligations under the different assumption (i.e. different medical cost inflation) and then applying the calibration factor.

Local Governments

The provision of public sector retiree health care to local government workers varies both by state and by type of local government worker (Clark 2010, Clark and Morrill 2010). In some cases there is centralized provision at the state level. This is often the case for K-12 teachers and other local education employees. In other cases, the benefit is provided directly by the local government—e.g. municipality, county, school district, etc.—who had employed the retiree. In at least a few instances, there is hybrid provision with retirees simultaneously receiving both centralized provision and local provision – e.g. Pennsylvania.

Collecting and processing the GASB OPEB reports for local governments in the manner done for the state reports is infeasible. To cite two admittedly extreme examples, Massachusetts and Pennsylvania have 87 and 1,422 entities, respectively, which potentially provide retiree health

care. Instead, we collect information on the *aggregate* state AALs for the two principal types of local government workers: K-12 education and other. The first step is determining who provides retiree health care to these workers. We use the state GASB reports as a starting point. In practice, though, the reports are often insufficient or misleading in determining who covers the two types of local workers.[4] We therefore rely on additional sources of information, such as publications and web source addressed to recipients of retiree health care and Chapter 6 of Clark and Morrill (2010). In many instances, we contacted public officials to collect the information.

The second step involves obtaining the information on the aggregate local AALs for the two classes of workers. Our preferred sources of this information are GASB OPEB reports (covering local workers), state government CAFRs and pension fund CAFRs. These sources, though, are generally only useful for states in which the provision of local retiree health care is centralized or for very large local government such as the City of Chicago and Cook County, Illinois. For non-centralized states and states for which we failed to locate the above reports, we rely on the best source of information available. Many decentralized provision states have commissioned reports which provide the aggregate AAL across the localities within the state. In other cases, non-government actors have produced similar reports.

Once we have obtained the aggregate AALs, we gross up the state government cash flows to reflect the local obligations. Specifically, we multiply the state government cash flow at all points in time by (1+s) where s is the local scaling factor: $s= s_e + s_o$, s_e=aggregate local education AAL / state AAL, and s_o=aggregate local non-education AAL / state AAL. For instance, if the aggregate AALs for teachers plus the AAL for other local workers sums to 100 percent of the state reported AAL, then s=1. By grossing up in this manner, we are assuming that the state workers provide a reliable proxy for the local workers in terms of the factors, such as the age-service distribution of active workers and the mortality of retirees, that determine the *contour*, or slope, of the retiree health care cash flows. (The *level* of the cash flows can be thought of as being pinned down by s.) We are also implicitly assuming that aspects of the retiree health plan that influence the contour, such as the relative generosity of the pre and post-Medicare benefit, are similar across state and local governments.

For some states, we were unable to locate any information on AALs for education and/or other local workers. (In many of these cases public officials in the state confirmed that no systematic collection of information has occurred on local OPEB obligations.) In these instances, we use Census Bureau counts of local government education and non-education employment and similar counts of state government employment. Specifically, we set the scale factor equal to the ratio of the count of local employees in question (education or non-education) to the count of employees covered in the state GASB report. For example, if we are lacking information on the aggregate

[4] E.g. several state GASB reports contain significant amounts of actuarial information for teachers which might be construed as suggesting that teachers are covered by the state retiree health plan. Further research, however, reveals that the state plan covers only the negligible number of teachers employed directly by the state (or grandfathered into the state plan) while the vast majority of teachers in the state are not covered by the state plan.

AAL for non-education workers and the state GASB report covers only state workers, we set s_o equal to the number of local workers divided by the number of state workers. As before, we are assuming that the state workers provide a reliable proxy for the local workers in terms of factors which determine the contour of the cash flows. In addition, though, we are further assuming that the per-active worker generosity of the program can be proxied for by the state cash flows. The validity of this assumption rests on the fact that state and local governments must compete for workers in the same labor market. We acknowledge, though, that the procedure is imperfect. While any errors from this procedure are likely to average out across the states for which we pursue this strategy, the local government estimates for states calculated under this method should be interpreted cautiously.

Appendix Table A1 contains the scaling factors for all of the states as well as detailed information on the sources of information underlying these scaling factors. The table also covers a few cases in which the state retiree health plan covers some, but not all, of one of the local worker categories. (This typically arises when localities have the choice of opting into the state retiree health program.) These situations are handled on a case-by-case basis as discussed on Table A1. In all cases, we have sought to obtain the best estimates possible for a given state, as opposed to enforcing uniformity in the method at which these estimates are derived across the states.

Results

Figure 1 presents some simple plots of the nominal liabilities for retiree health that we calculate from the GASB reports. Panel A shows the PVB and the AALs for all retirees, and Panel B decomposes these into a set of projections for retirees and current workers (actives). As would be expected, the liabilities for the existing retirees fade over time, while those for current active workers rise over time, peaking somewhere around 2040 for most states.

Table 1 reports the AALS and PVBs of the retiree health insurance obligations for each state plan.[5] Columns (1) and (4) report the AAL and PVB, respectively, as reported in the GASB statement. Similar presentations of stated liabilities have been made by Clark and Morrill (2010) and Pew (2012). The remaining columns impose a uniform discount rate of 5 percent across the states. The 5 percent discount rate is equal to the rounded average of the state chosen discount rates and is used only to impose uniformity (i.e. it does not reflect a position on what the appropriate discount rate is). States with missing stated PVBs (column 4) are those that only report the AAL (and thus are the states for which we have done the calibration off the AAL instead of the PVB). The retiree health obligations vary substantially across states, with 12 states having PVBs equal to less than 10% of annual revenues, while 5 states have PVBS that are

[5] As noted by Clark (2010), some states include local teachers in their plans, and some do not, so the values reported in the table do not necessarily represent the benefits of state government employees only.

roughly 90% of revenue or higher. Because some states include teachers and other local workers in their plans while others do not, however, the values in Table 1 are somewhat difficult to compare across states.

Table 2 includes our estimate of the joint retiree health obligations of state and local governments. Column (1) reports the scaling factor that we used to gross up the state obligations and assets. For some states, like Delaware, New Jersey, and Hawaii, local workers receive their retiree health benefits through the state plan, and no grossing up is necessary. In other states, like Minnesota and Florida, the state retiree health plan covers only a small fraction of the state and local workers who receive retiree health insurance. The table is sorted by the ratio of retiree health care liabilities to state and local revenues. As the table makes clear, accounting for the local plans increases the variation in retiree health obligations, with the present value of accrued actuarial benefits varying from a low of 2 percent of state and local revenue (Indiana) to a high of 85 percent (Illinois). Most retiree health plans are largely unfunded, so there are generally only modest differences between the AALs and the unfunded AALs (UAALs), defined as the AAL less the assets in a dedicated trust fund.

Figure 2 shows the distribution of the UAALs across the states. More than half of our states have UAALs that are 20 percent or less of state and local revenues, but a number of states have UAALs greater than 50 percent of state and local revenues.

Table 3 compares the distribution of liabilities for retiree health plans with those of state and local pension plans. Solely for purposes of uniformity, both types of liabilities are discounted with a 5 percent rate. Columns (4) through (6) compare the PVBs of the two types of plans. The benefits provided by retiree health plans are typically much smaller than those provided by pension plans, both because the average retiree pension is larger than health expenditures, and because Medicare steps in at age 65 to cover the lion's share of health costs. On the other hand, continuing rapid growth in health costs mean that retiree health expenditures rise at a faster pace than pension benefits. On average across the states the present value of retiree health benefits is 21 percent of the present value of pension benefits, although there is wide variation. The top panel of Figure 3 shows the distribution across the states. In 16 states, the retiree health PVB is less than 15 percent of the pension PVB; in 6 states, the retiree health PVB is 50 percent or more of the pension PVB.

But most state and local pension plans are significantly better funded than the retiree health plans. Columns (1) through (3) of Table 3 present a comparison of the unfunded accrued liabilities (UAAL). On average, the retiree health UAAL is 43 percent of the pension UAAL. For about 10 percent of states, the retiree health UAAL is 75 percent or more of the pension AAL. The bottom panel of Figure 3 shows the distribution across the states. Furthermore, Figure 4 shows that there is some correlation between the size of the unfunded pension liability and the size of the unfunded retiree health liability, with states like Illinois, New Jersey, Connecticut, Hawaii and Michigan all showing sizable unfunded liabilities as a share of revenue for both

types of employee post-retirement benefits. On the other hand, a number of the states with large unfunded pension liabilities have relatively small unfunded retiree health liabilities, including Virginia, California, and Ohio.

Alternate Assumptions

As noted above, once we have projected the cash flows for each state and calibrated them, we can easily adjust any of the input assumptions and recalculate the PVB under the alternative assumptions. For example, Table 4 shows that the PVBs are quite sensitive to the assumed discount rate. For the US as a whole, for example, the PVB under a 7 percent discount rate is just over 40 percent of the PVB under a 3 percent discount rate. The sensitivity of the AALs, which are more heavily weighted toward current benefits (as many of the far off future benefits are as yet unaccrued) is just a bit less, with the AAL using a 7 percent discount rate just over 50 percent of the AAL using a 3 percent rate.

Table 5 examines the sensitivity of the retiree health benefits to the assumption about health care cost growth. The assumptions underlying the GASB reports almost universally assume that health care costs will slow over time, but generally to a rate that continues to exceed inflation and compensation growth. This assumption is at odds with the convention that has been adopted for some time by both CBO and the Center for Medicare and Medicaid Services (CMS) in their projections of Medicare, Medicaid, and private health insurance spending, which assumes that health cost growth slows over time. CBO, for example, assumes that excess cost growth in Medicaid and private insurance premiums—defined as the excess of health cost growth per beneficiary over GDP per capita—declines gradually from 1.6 percent in 2011 to 0 percent by 2087.[6] Applying these rates of growth to the retiree health liabilities lowers our measure of the PVB and AAL for state and local retiree health liabilities by an average of 15 percent. In four states (Michigan, Ohio, Utah, and West Virginia), the CBO health cost assumption boosts the PVBs. In the remainder of the states, the PVBs decline, with the decline exceeding 25 percent in Illinois, New Mexico, Florida, Pennsylvania and Washington.

III. State and Local Long-Term Budget Projections

In this section of the paper, we develop the broader long-term budget projections for the state and local sector, using state-specific population projections. We uses these population projections to project state GDP, which we the use as the basis to project state and local revenue growth. We also model the likely evolution of education expenditures—which we presume are affected by the size of the K-12 population— and Medicaid, which is affected both by demographic change and our assumptions about excess cost growth.

[6] See Congressional Budget Office, The 2012 Long-Term Budget Outlook, June 2012 and Table 6 in the Supplemental Material at http://www.cbo.gov/publication/43288.

We examine state and local governments within a state as a single, aggregated unit. For most budget items, we define "current policy" as the policy that maintains the budget item's share of state GDP over time. Thus, revenues such as taxes and fees are generally assumed to rise proportionally with state GDP. We divide expenditures into demographically-sensitive and demographically-insensitive categories. Demographically-sensitive categories are expenditures likely to respond to a shift in the age distribution of a state. In addition to pension benefits and retiree health care, the demographically-sensitive expenditure categories consist of Medicaid, K-12 Education and Higher Education. We also account for excess cost growth in Medicaid and retiree health.[7] These expenditures rise over time according to the methodology described below.

All other expenditures are assigned to the demographically-insensitive category and are assumed to increase with state GDP. This assumption of constant GDP shares seems to be a reasonable estimate of a current policy baseline and is the assumption used by the Congressional Budget Office (CBO) for their long-run projections of federal discretionary spending.

Population

We use the Census Bureau's most recent set of state population projections from 2000-2030 by age and sex, which were based on the 2000 census and released in 2005, and extrapolate them beyond 2030. Unfortunately, the Census Bureau has stopped producing these estimates, and thus our estimates are somewhat dated. Nonetheless, the basic population dynamics, which are summarized in Table 6, are not likely to have changed for most states. For the country as a whole, the adult share of the population declines by 10 percent by 2030, the kid share of the population declines by 4 percent, and the aged share of the population increases by 52 percent. The aged dependency ratio—the ratio of the aged population to the working age population—rises 14 percentage points for the country as a whole, from 23 percent in 2011 to 37 percent. There is some variation across the states, although most exhibit this basic pattern. Figure 5 plots the distribution across the states in the change in the adult population share (top panel) and the change in the aged dependency ratio (bottom panel). Almost half the states show an increase in the aged dependency ratio of between 12 and 15 percentage points, but some states (Utah and Texas, for example) have somewhat smaller increases, while other states (Montana, Wyoming, and New Mexico) show much larger increases.

State GDP

We use the population projections to develop our baseline state GDP. Our methodology is as follows. We take CBO's projection of nominal national GDP by year and divide it by our projection of the population aged 20 and over to get a measure of GDP per adult population, which, assuming no changes in adult labor force participation, should be proportional to GDP per

[7] We assume that total compensation rises with GDP, thus implicitly assuming that any excess cost growth in the health insurance costs of existing workers is offset by lower wages or other benefits.

worker. For each state, the growth rate of GDP per year is assumed to be equal to the growth rate of the adult population, taken from the Census projection, plus the growth rate of GDP per worker, which we assume does not vary across the states. Thus, we assume that there is no convergence or divergence in state rates of productivity growth, and deviations in the growth rate of GDP across states stem only from differences in demographics. States with more slowly growing working age population are expected to grow more slowly than other states. As shown in Table 7, using this methodology results in an average nominal GDP growth rate of 4.4 percent per year, with estimates by state ranging from 3.2 percent to 5.9 percent. Figure 6 shows the distribution of our projected GDP growth rates across the states.

Retiree Health Projections

Our measures of the annual expenditure, or cash flow, required to provide promised health care benefits to retirees are based on the stock of employees and retirees in the base year. They do not account for new employees. This is problematic as we aim to construct long-term budget projections under a current policy framework. Imposing any type of freeze on pension or retiree health participation for new workers would be inappropriate for our baseline projections, as it would represent a policy change rather than a continuation of current policy. Thus, for our retiree health cash flows, we explicitly create new workers and provide them with benefits.

The methodology to create new workers is straightforward. Our baseline projections already include a projection for state and local payroll; for personnel associated with demographically-insensitive categories of spending, payroll rises with state GDP; for teachers and other educators, personnel costs rise with education expenditures. Under the assumption that wage growth in the state and local government sector rises with productivity growth in the general economy, we can then calculate the total workforce of the sector by state. To create new entrants to the workforce, we simply add employees to the remaining existing workforce year by year in order to hit this total target workforce. We assume that new employees enter the workforce at the same ages as the existing workforce—that is, we use the age distribution of those with less than 1 year of service from the GASB reports to determine the age distribution of new workers. Once these workers are added to the stock of existing workers, we simply assume that they flow through the work years with the same termination, disability, mortality, and retirement probabilities as the existing workforce. Figure 7 shows our projection of the state and local labor force for the US as a whole. Over time, the existing workers move into retirement, and are replaced by newly hired workers. The bottom panel of the figure shows the same streams for retirees. One interesting finding is that, given the GASB report assumptions on employee turnover and eligibility, the share of current workers eventually receiving retiree health benefits is quite low. Thus, even including retirees from newly-hired workers, there is no large bulge in the population of retirees, despite the significant increases in the share of the elderly population in all the states.

Pension Projections

We also needed to supplement the pension cash flows provided to us by Novy-Marx and Rauh to account for new workers, as their flows only account for current workers. Given that our goal is to project government deficits in the state and local sector under a current policy framework, we require a method to project pension benefits on a continuing basis. Our procedure, which we carry out for each state individually, is as follows: We first calculate the average age of the stock of retirees and the average pension benefit per retiree in 2011and then gross up that benefit to account for the likely differences in lifetime wages, and hence pension benefits, between younger newly-retiring cohorts and the stock of existing (and older) retirees. We assume that the initial benefit increases with the wage, but that benefits thereafter increase with inflation. In particular, label the year of retirement R, the average age of the existing stock of retirees AE, the average age of newly retiring workers AN, the historical wage growth and inflation rate HW and HI, respectively, and the projected wage growth and inflation rate PW and PI respectively. Then for a worker who retires at year R, the pension benefit in time t is equal to:

$$\text{PB}_{R,t} = \text{Average Pension Benefit}_{2011}\left(\frac{1+HW}{1+HI}\right)^{AE-AN}(1+PW)^{R-2011}(1+PI)^{t-R}$$

By keeping track of the year of retirement, we can thus calculate the total pension benefits paid to retirees from newly-hired workers over time. Adding that to the cash flows from the existing retirees and workers gives us a measure of the pension obligations on a current policy baseline.

Medicaid Projections

Population aging can affect state Medicaid expenditures because per capita Medicaid spending varies by age. One often cited statistic is that two-thirds of Medicaid spending is allocated to the disabled and the elderly, suggesting that population aging will result in a large boost to Medicaid outlays. [8] However, Medicaid spending on the elderly alone is a much smaller share of overall spending—just 21 percent in 2010—so, nationally, demographic change is not likely to be a major driver of state Medicaid expenditures.

[8] For example, see Center on Budget and Policy Priorities, "Policy Basics: Introduction to Medicaid," http://www.cbpp.org/cms/index.cfm?fa=view&id=2223. May 8, 2013.

The following table reports national Medicaid spending by eligibility category for 2010.[9]

2010 Estimated Enrollment, Expenditures, and per Enrollee Expenditures, by Enrollment Group			
Eligibility Group	Enrollment Shares	Spending Shares	Per Enrollee Spending
Children	51%	20%	$2,717
Adults	22%	14%	$4,314
Disabled	18%	45%	$16,963
Aged	9%	21%	$15,495
Total	100%	100%	$6,775

The disabled category excludes all Medicaid beneficiaries ages 65 or older, but includes both disabled nonelderly adults and disabled children. Although there is no published age distribution of disabled Medicaid beneficiaries, the age distribution of the nonelderly SSI population –which is 20 percent children and 80 percent nonelderly adults--should be a reasonable proxy.[10] Under this assumption, we can compute national Medicaid expenditures and enrollment by age group:

	Estimated Medicaid Enrollment and Expenditures by Age, 2010				
Age	Share of Population with Medicaid	Share of Medicaid Enrollment	Share of Medicaid Expenditures	Per Beneficiary Medicaid Spending	Per Capita Medicaid
0-18	36%	54%	24%	$3,656	$1,334
19-64	10%	37%	49%	$9,229	$947
65+	12%	9%	27%	$15,354	$1,826
Total	17%	100%	100%	$6,766	$1,161

A back-of-the-envelope calculation gives a good idea of the effect of demographic change on total Medicaid expenditures. Using 2010 spending per age group, and assuming that the share of the population covered by Medicaid is unchanged, one can calculate what the spending would

[9] Department of Health & Human Service, 2011 Actuarial Report on the Financial Outlook for Medicaid, CMS Office of the Actuary, March 16, 2012.

[10] Distribution of Supplemental Security Income (SSI) Beneficiaries by Age, Kaiser Family Foundation State Health Facts, 2010. http://kff.org/medicaid/state-indicator/distribution-of-total-ssi-by-age/. The most recent data on Medicaid spending by age are from the CMS National Health Accounts for 2004.

have been in 2010 under the age distribution of 2030. As shown in the following table, the pure effect of demographic change between 2010 and 2030 is, on average, very small, increasing average Medicaid spending per capita by just 6 percent.

	Spending in 2010	Proportion in 2010	Proportion in 2030*
Children	$1,334	25%	27%
Adults	$947	61%	53%
Aged	$1,826	13%	20%
Average Spending		$1,160	$1,227

But there is a lot of variation across states in the extent of aging and the distribution of Medicaid expenditures by age, so it is possible that the effects of Medicaid on the states could be different. In addition, these calculations have not factored in the effects of the ACA or excess cost growth. Finally, by assuming that spending by age group is constant, these calculations ignore the fact that it is, by and large, the oldest old who account for most of the Medicaid spending for the aged, as they are the largest users of long-term care. However, as we show below, focusing on this group actually reduces the impact of demographic change on Medicaid spending between now and 2030, because the retirement of the baby boom generation actually lowers the average age of the elderly until about 2030.

Our procedure to estimate the effects of state-specific effects of population aging is as follows. For each state, we calculate per capita Medicaid expenditures in fiscal 2009 for three demographic groups: children, non-elderly adults, and the aged.[11] Our measure of per capita Medicaid spending is equal to total state Medicaid expenditures allocated to a demographic group (for example, total Medicaid spending on children) divided by that group's population (for example, total number of children in a state). Per capita expenditures for each demographic group will vary across states both because of differences in the level of per enrollee Medicaid spending on the group and because of differences in the proportion of the group population that is enrolled. We then adjust the base year per capita spending by demographic group to account for the likely effects of the ACA on state Medicaid spending, assuming that all states choose to take up the ACA's Medicaid expansion.[12]

[11]Kaiser State Health Facts provides the state share of Medicaid spending by eligibility category: children, nonelderly disabled, nonelderly adults, and the elderly for each state (www.statehealthfacts.org). We allocate 85 percent of spending on the disabled to non-elderly adults and 15 percent to children.

[12] Our methodology to adjust for the ACA is as follows. We use the estimates of the effects of the ACA on Medicaid spending by state over the 2013-2022 period from Holahan, Buettgens, Carroll, and Dorn (2012). The ACA is expected to increase Medicaid expenditures by expanding eligibility for non-elderly adults and by increasing take-up

Our estimates of the effect of aging on Medicaid spending by state assume that per capita expenditures by demographic group are constant over time; average per capita Medicaid expenditures change because the share of the population in each demographic group changes. Define mk_i, ma_i, and me_i as the state-financed per capita Medicaid spending in state *i* in the base year for children, non-elderly adults and the elderly, respectively. Define pk_{it}, pa_{it}, and pe_{it} as the population shares of children, adults, and the elderly in state *i* at time *t*. Then, average per capita state Medicaid spending m_{it} is just:

$$m_{i,t} = mk_i \cdot pk_{i,t} + ma_i \cdot pa_{i,t} + me_i \cdot pe_{i,t}$$

Define sk_i, sa_i, and se_i as the shares of Medicaid spending allocated to kids, adults, and the elderly in the base year. Then, then the percentage change in per capita Medicaid in state *i* at time *t* relative to the base year is:

$$\frac{m_{i,t} - m_{i,0}}{m_{i,0}} = \frac{mk_i(pk_{i,t} - pk_{i,0}) + ma_i(pa_{i,t} - pa_{i,0}) + me_i(pe_{i,t} - pe_{i,0})}{mk_i \cdot pk_{i,0} + ma_i \cdot pa_{i,0} + me_i \cdot pe_{i,0}}$$

$$= sk_i\left(\frac{pk_{i,t} - pk_{i,0}}{pk_{i,0}}\right) + sa_i\left(\frac{pa_{i,t} - pa_{i,0}}{pa_{i,0}}\right) + se_i\left(\frac{pe_{i,t} - pe_{i,0}}{pe_{i,0}}\right)$$

Table 8 presents our estimates of the effects of aging across the states in 2030. The first column reports our estimate of the impact of aging alone on Medicaid spending by 2030. We also report our estimates of the share of Medicaid allocated to each group in 2009 (with our ACA adjustment; the percentage changes in population shares by 2030 were reported in Table 6. On average, aging has a relative small effect on Medicaid, increasing expenditures 6 percent by 2030, relative to 2009. However, the effect of aging varies across the states. For example, aging boosts spending in North Dakota by 12 percent, whereas it lowers spending by 8 percent in New Mexico.

An alternative method of projecting the effects of aging on Medicaid spending would be to divide spending on the elderly into two components: spending on long-term care and spending for other services, and calibrate the growth in elderly long-term care spending based on the share of the projections of the growth in the 85 plus population. This methodology actually shows a

---

among those already eligible for Medicaid under current law. We assume that all of the increase in Medicaid expenditures associated with the eligibility expansion is spent on adults, and that the increase in expenditures related to higher take-up rates is allocated to both children and adults in proportion to their pre-ACA expenditures. We adjust the Urban Institute's estimates so that they reflect the costs to states once the ACA is fully phased in. (The federal share of expenditures for the newly-eligible population is 100 percent for the first three years of the program, and then declines gradually to 90 percent; we calculate the cost to the states as if their share were 90 percent.) We then calculate the percentage increase in state expenditures by demographic group and adjust our baseline data accordingly, so that it represents what spending would have been in fiscal 2009 had the ACA been in effect.

slightly smaller effect of aging by 2030, because the growth in the 85 plus population lags behind the growth of the 65 plus population. Given that the effects of aging on Medicaid expenditures are relatively small, and the differences between the two methodologies are likewise small, we have chosen to use the simpler method presented in the table.

Finally, Medicaid expenditures are likely to rise over time because of population growth and health cost growth. If relative health costs rose with per capita GDP, Medicaid spending would be constant as a share of GDP over time, save for the effects of the changing age distribution of the population. But per-person health costs have historically increased at a rate faster than per capita GDP; this excess is typically referred to as excess health cost growth. For our baseline projection, we use CBO's estimate of excess cost growth in Medicaid over the 2010-2030 period, which averages about 1½ percentage points. Thus, by 2030, the combined effects of aging and excess health cost growth increase state Medicaid spending as a share of GDP by about 45 percent on average.

Education Projections

We use a very similar methodology to project education spending. We assume that teacher's wages ($w_{Teachers}$) are proportional to the average wage in a state (w):

$$w_{Teachers\ j,t} = \xi w_{j,t}$$

and the number of teachers (*Teachers*) is proportional to the number of school-aged children in that state (*Kidpop*, assumed to be the number of people ages 6 to 18):

$$Teachers_{j,t} = \varpi Kidpop_{j,t}.$$

Also, as described above, state *GDP* is proportional to the wage bill, the wage times the number of workers, and the number of workers is assumed proportional to the working-age population:
$GDP_{j,t} = \phi w_{j,t} L_{j,t} = \phi w_{j,t} \mu Adultpop_{j,t}$

Under these assumptions, education spending as a share of GDP for state j at time t can be written as follows:

$$\begin{aligned}\frac{\text{Educ Spending}_{j,t}}{GDP_{j,t}} &= \frac{w_{Teachers\ j,t} \times Teachers_{j,t}}{GDP_{j,t}} \\ &= \frac{\xi w_{j,t} \times \varpi Kidpop_{j,t}}{\phi w_{j,t} L_{j,t}} = \frac{\xi w_{j,t} \times \varpi Kidpop_{j,t}}{\phi w_{j,t} L_{j,t}} = \frac{\xi w_{j,t} \times \varpi Kidpop_{j,t}}{\phi w_{j,t} \mu Adultpop_{j,t}} \\ &= z \frac{Kidpop_{j,t}}{Adultpop_{j,t}}\end{aligned}$$

Under these assumptions, K-12 education spending as a share of GDP moves with the ratio of school-aged children to adults. Similarly, spending for higher-education is assumed to move with the proportion of college-aged people, assumed to be ages 19 to 24.

Deficit Projections

With these projections of GDP and expenditures on Medicaid, education, retiree health, and pensions, and given our assumption that all other spending and all revenues rise with GDP, we can now project budget deficits by state. The state and local general government deficit for state *s* in year *t*, $Def_{s,t}$ is defined simply as the difference between revenues and expenditures. This projected deficit needs to be interpreted carefully. State and local governments operate under balanced budget rules which generally prevent them from borrowing for non-capital expenditures. States cannot, in practice, run long-term, structural deficits. Thus, the deficit measures should be viewed as a quantification of the extent of budget stress under which the governments will find themselves, conditional on the validity of our assumptions. Stated differently, the deficits capture the extent to which governments will have to cut expenditures and/or raise taxes in the future to address structural budget shortfalls. For this reason, we do not model a direct link between expenditures and revenue and government debt and assets (other than the pension and retiree health care trust funds). Thus, we assume that states do take measures each year to maintain balance in their operating accounts, and do not account for the interest payments that would be due were the sector actually to run the deficits implied by our projections. Implicitly we are assuming that states continue to issue and retire debt for capital expenditures at a rate which maintains a constant debt-to-GDP ratio, maintains a constant ratio of debt servicing costs as a fraction of GDP and provides a constant ratio of funds available for new capital expenditures.

Pension and retiree health care trust funds are generally not available for funding general government expenditures. They can generally only be used to fund retiree benefits. These trust funds are therefore considered to be outside of the general government budget and do not contribute to the calculation of annual deficits. Specifically, employee contributions to the pension trust fund are not considered to be government revenue when calculating the deficit. Nor are the annual returns on assets in the trust fund counted as revenue for the deficit calculation. Similarly, benefit payments from the trust fund are not considered as expenditures for the deficit calculation. Only government contributions into the trust fund are considered as expenditures, as are benefit payments made directly by the state when the trust fund has been exhausted.

In order to focus on structural, as opposed to cyclical, budget considerations, deficits as a percent of GDP are normed to equal zero in the base year. This removes from the deficit the large cyclical impact of the recent financial crisis and recession. The normalization also addresses the possibility that data inconsistencies across the various data sources may introduce error into the deficit calculations. Any such error should be removed by the normalization. (We make an

equal adjustment to revenues and expenditures so that the budget is in balance in our baseline year.)

Figure 8 plots our projected path of deficits in the state and local sector as a share of projected state and local revenue. The dashed blue line represents the total deficit for the sector. The green line in the figure shows the deficit caused by retiree health obligations, using the states' own assumption about excess cost growth. The red line shows the deficit attributable to state and local pensions. For this figure, we assume that pension plans do not show any deficits until their trust funds are exhausted. Pension deficits begin to drop off sharply sometime after 2025 as state pension funds begin to be exhausted. A comparison of the green and red lines shows the effects of the trust funds: Because retiree health obligations are mostly unfunded, they exert pressure on state and local budgets long before the pension plans do, even though the size of the pension problem is significantly greater in the long run. Finally, the yellow line shows the effect of changes in Medicaid and Education. The combination of an older population and excess cost growth in Medicaid spending present a much larger challenge to state and local governments than retiree health and pensions combined. And, although Medicaid's direct impact is only on state budgets, it seems reasonable to assume that pressures on state budgets will end up affecting local government finances as well, as higher Medicaid spending crowds out state grants to local governments.

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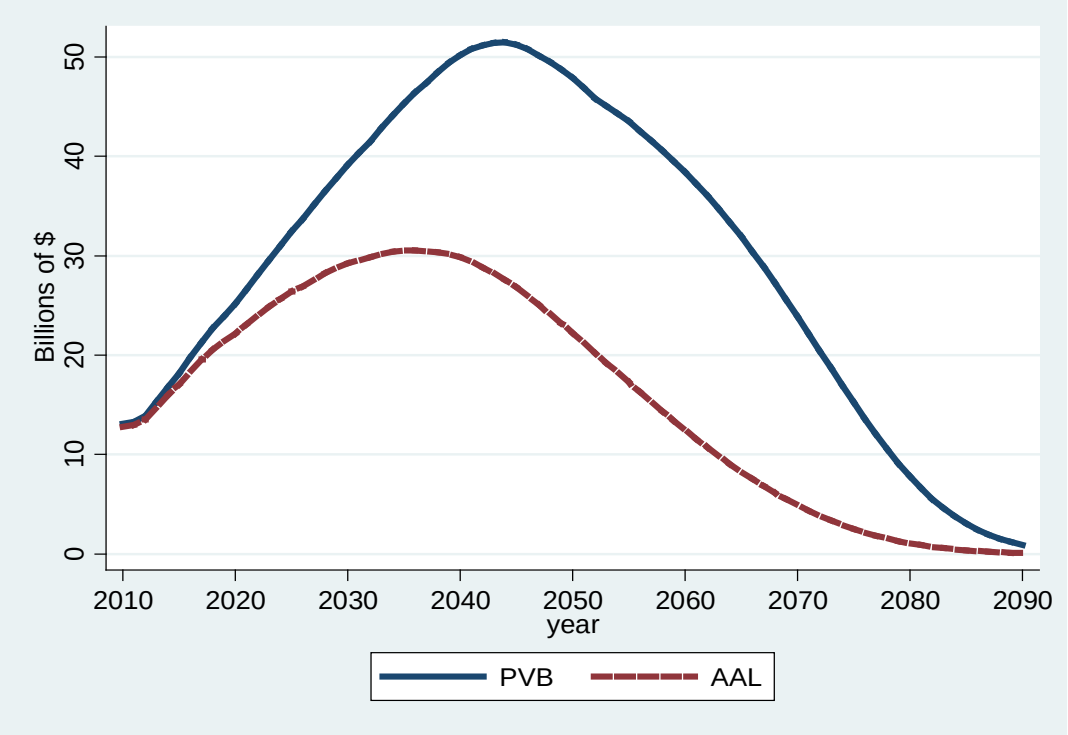
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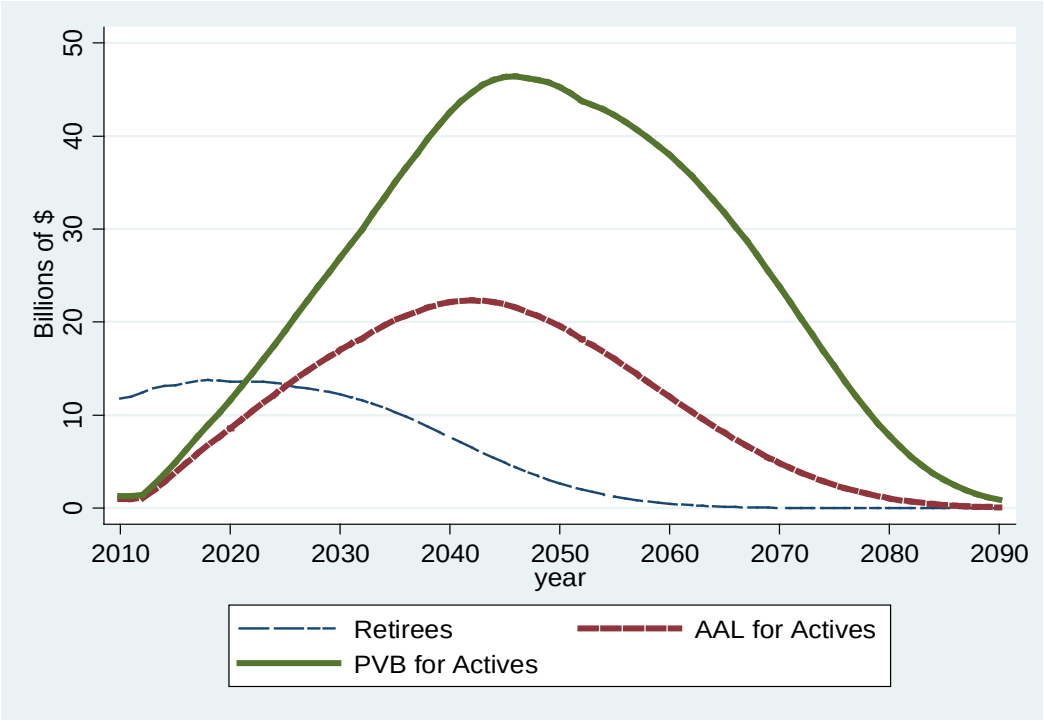
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Figure 1

Panel A: Total Retiree Health Care Liabilites, by Year



Panel B: Retiree Health Care Liabilites for Actives and Retirees, by Year



Note. The panelsdisplay cash flows for retiree health care obligations. The cash flows are calibrated to match the discounted value of the cash flows stated in the state GASB report. See the text for additional information. The AAL liabilites are calculated under the EAN methodology.

Figure 2

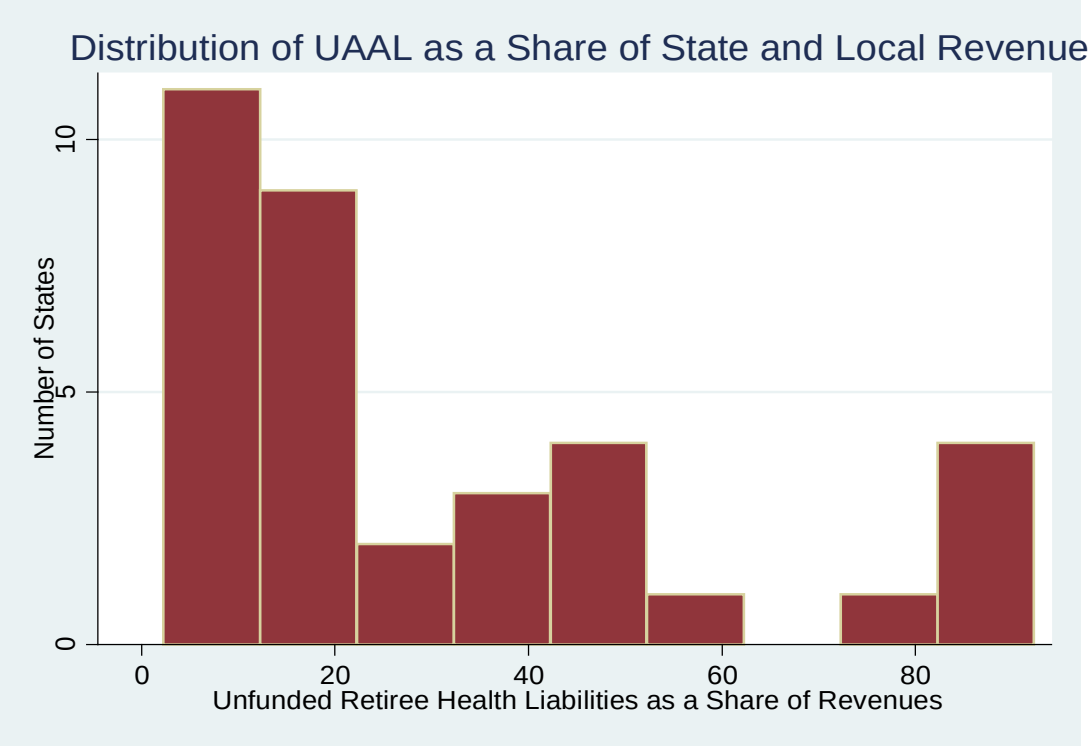
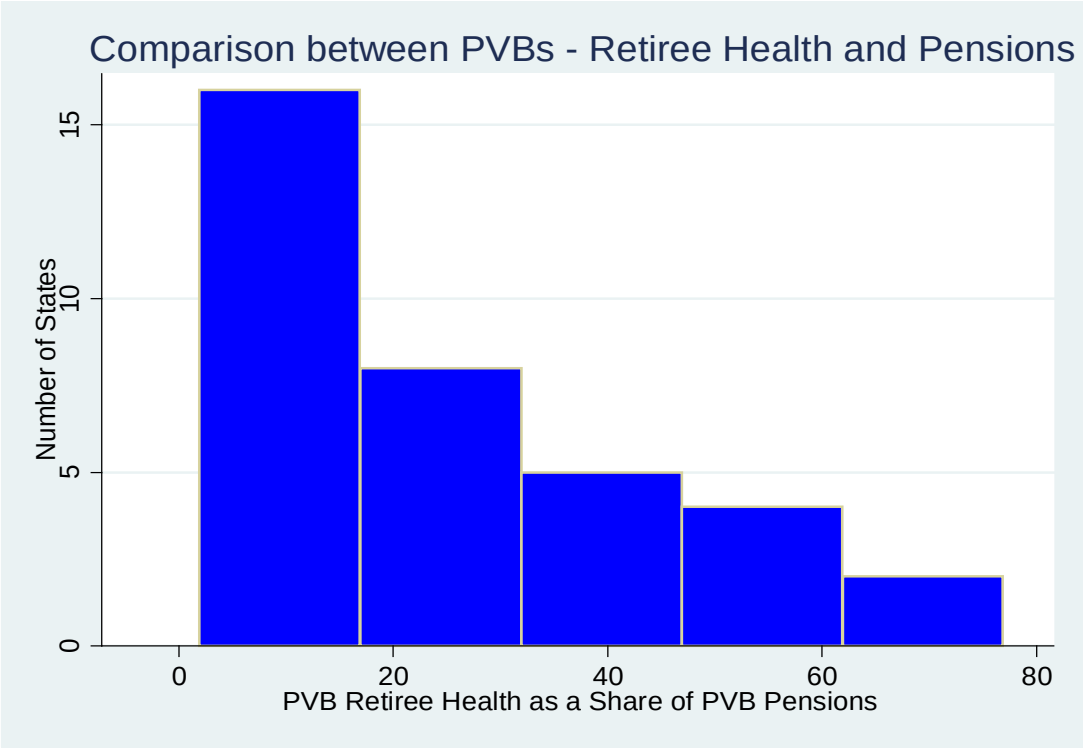

Distribution of UAAL as a Share of State and Local Revenue
Number of States
0
5
10
0
20
40
60
80
Unfunded Retiree Health Liabilities as a Share of Revenues

Figure 3


Comparison between PVBs - Retiree Health and Pensions
Number of States
0
5
10
15
0
20
40
60
80
PVB Retiree Health as a Share of PVB Pensions

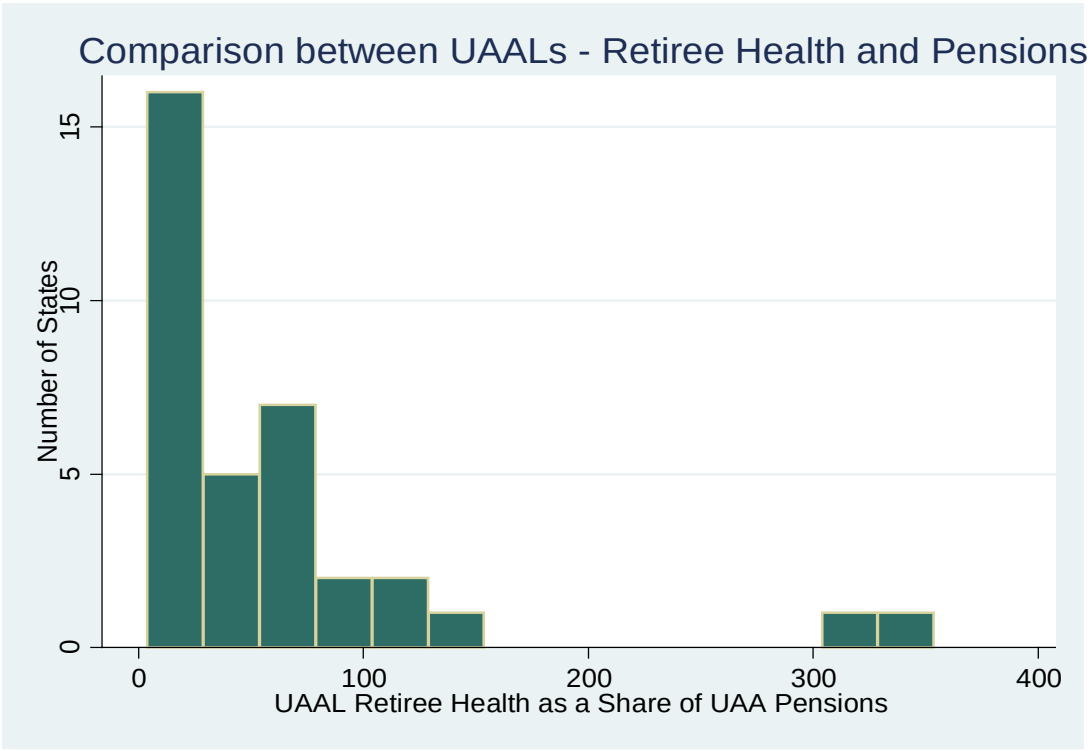

Comparison between UAALs - Retiree Health and Pensions
Number of States
0
5
10
15
0
100
200
300
400
UAAL Retiree Health as a Share of UAA Pensions

Figure 4

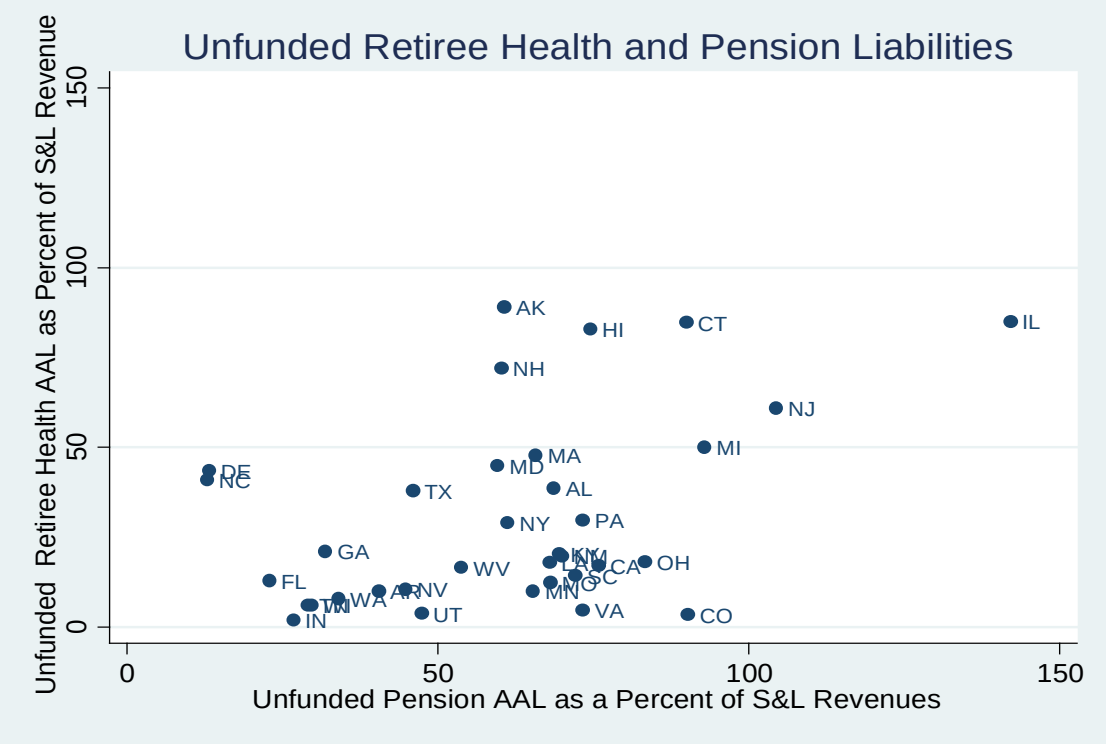
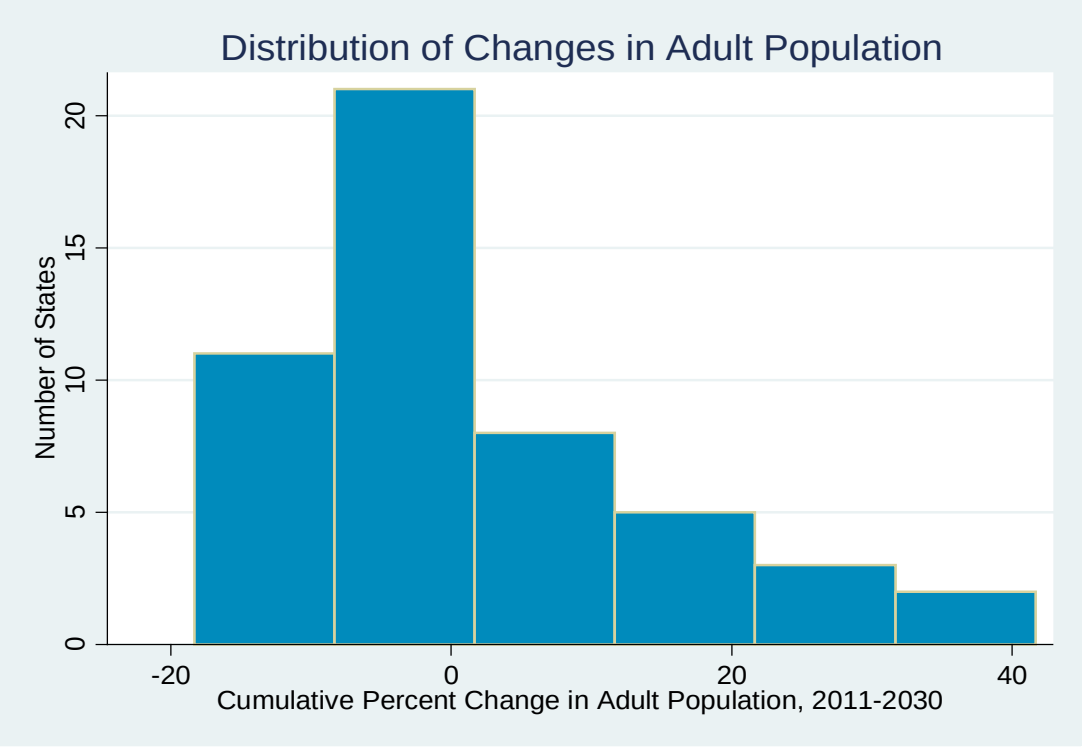

Unfunded Retiree Health and Pension Liabilities
Unfunded Retiree Health AAL as Percent of S&L Revenue
0
50
100
150
Unfunded Pension AAL as a Percent of S&L Revenues
0
50
100
150
AK
HI
CT
IL
NH
NJ
MI
MA
MD
DE
NC
TX
AL
NY
PA
GA
WV
OH
CA
FL
NV
UT
VA
CO
IN

Figure 5
Demographic Projections



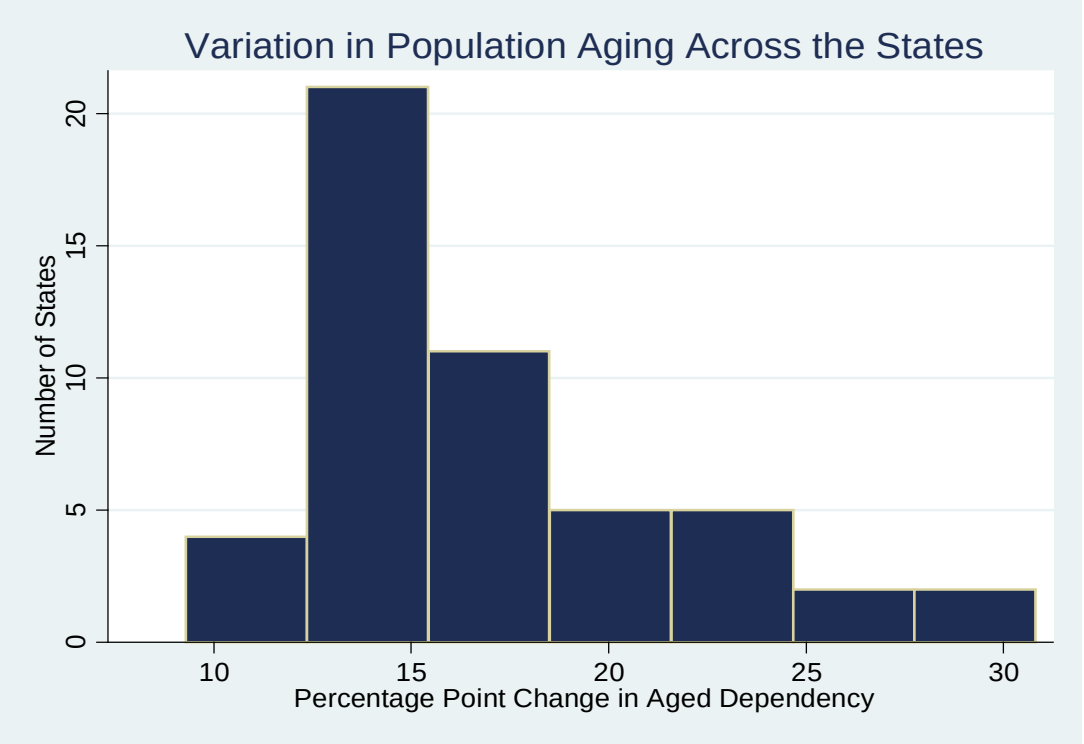


Figure 6

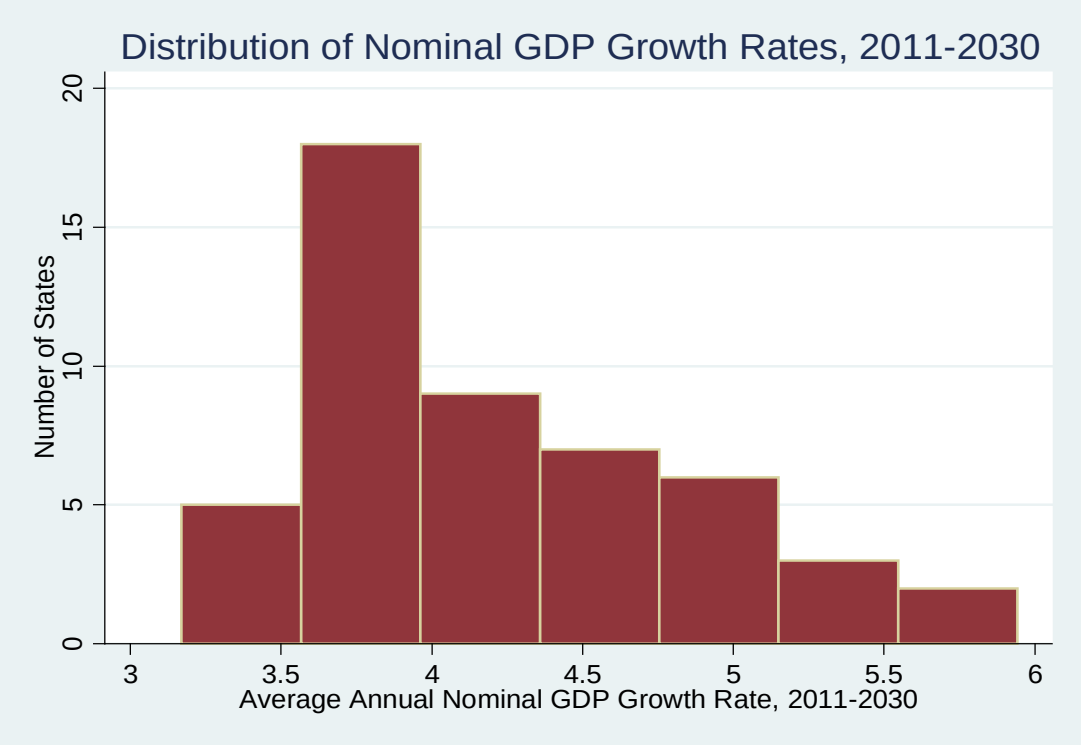
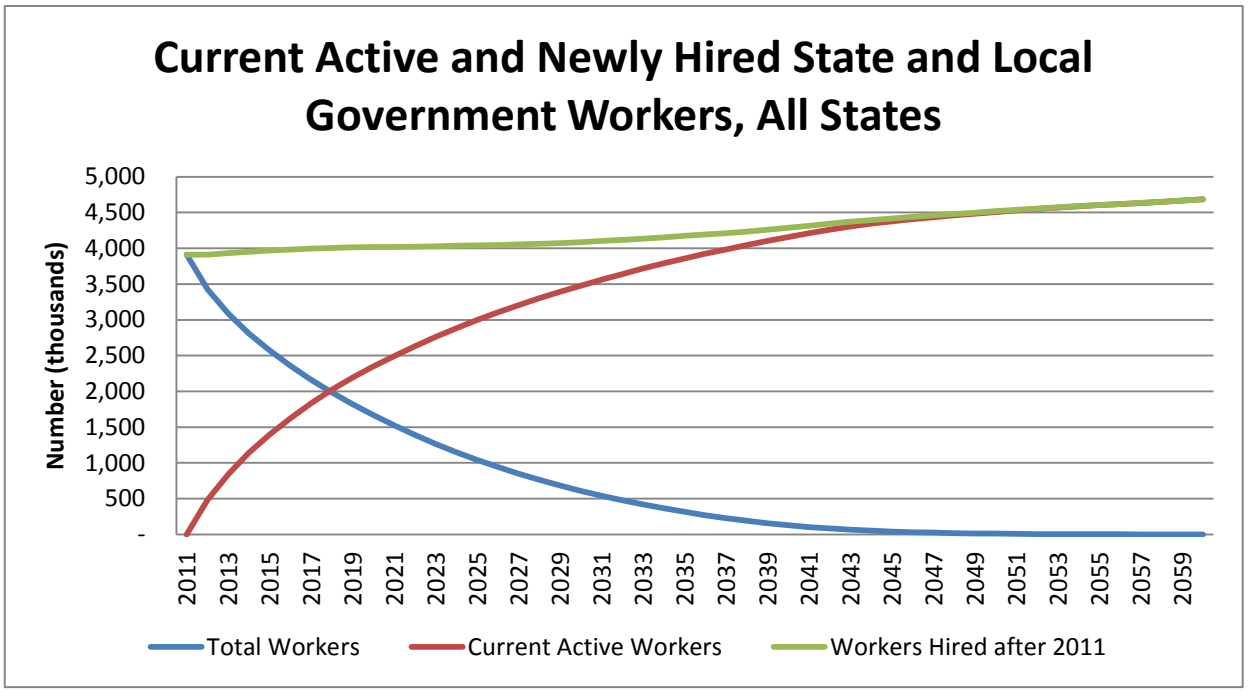

Distribution of Nominal GDP Growth Rates, 2011-2030
Number of States
0
5
10
15
20
3
3.5
4
4.5
5
5.5
6
Average Annual Nominal GDP Growth Rate, 2011-2030

Figure 7


Current Active and Newly Hired State and Local Government Workers, All States
Number (thousands)
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
-
2011 2013 2015 2017 2019 2021 2023 2025 2027 2029 2031 2033 2035 2037 2039 2041 2043 2045 2047 2049 2051 2053 2055 2057 2059
Total Workers
Current Active Workers
Workers Hired after 2011

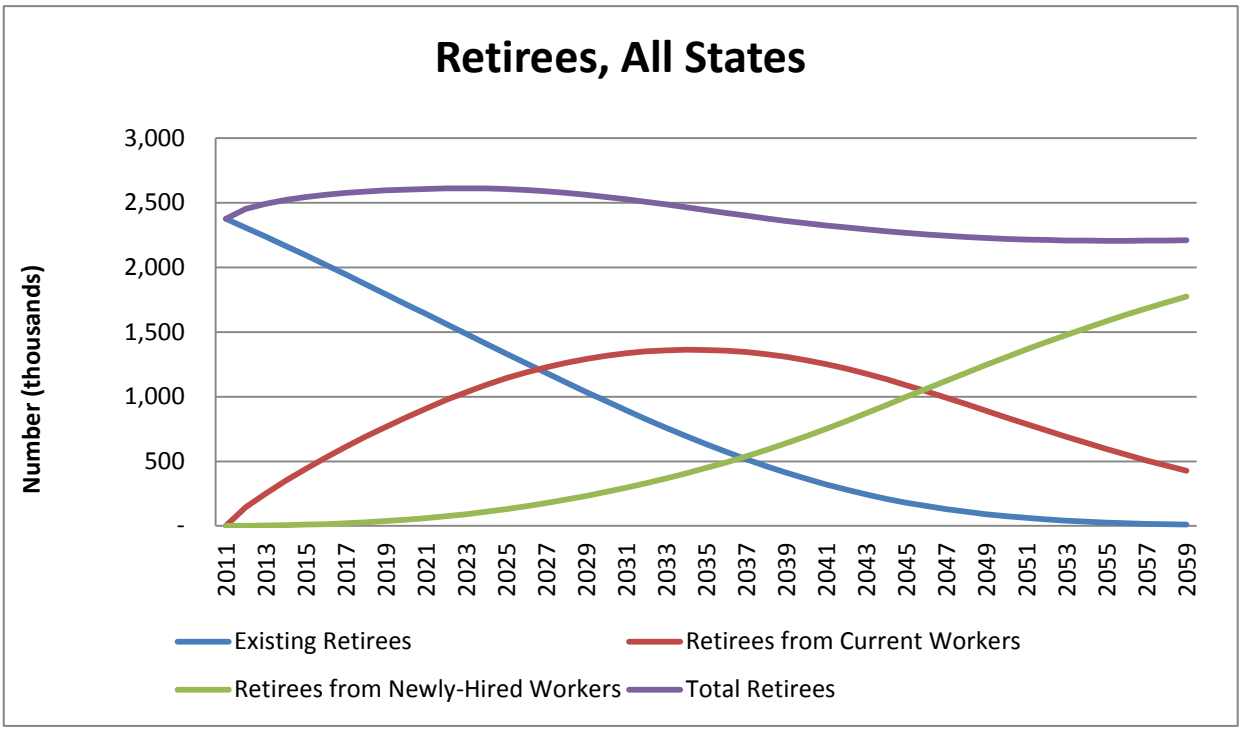

Retirees, All States
Number (thousands)
3,000
2,500
2,000
1,500
1,000
500
-
2011 2013 2015 2017 2019 2021 2023 2025 2027 2029 2031 2033 2035 2037 2039 2041 2043 2045 2047 2049 2051 2053 2055 2057 2059
Existing Retirees
Retirees from Current Workers
Retirees from Newly-Hired Workers
Total Retirees

Figure 8

Deficit for State and Local Governments

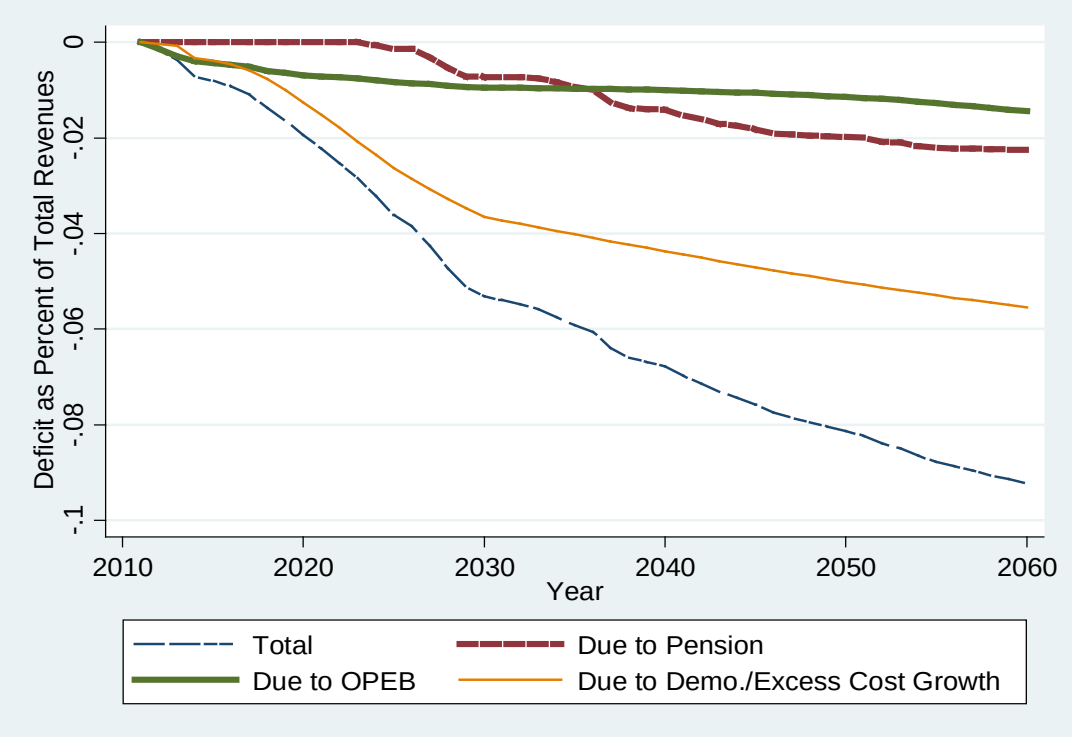


Table 1
State Retiree Health Care Liabilities

State	Actuarial Accrued Liability (AAL)			Present Value of Benefits		
	Stated ($ millions)	EAN Methodology & 5% Discount Rate ($ millions)	EAN Methodology & 5% Discount Rate (% State Revenue)	Stated ($ millions)	5% Discount Rate ($ millions)	5% Discount Rate (% State Revenue)
	(1)	(2)	(3)	(4)	(5)	(6)
AK	$7,429	$11,966	80%	$8,081	$13,382	90%
AL	$3,370	$3,370	13%	.	$4,262	16%
AR	$1,953	$1,688	7%	.	$1,734	8%
AZ	$1,504	$2,354	6%	.	$4,262	12%
CA	$62,144	$56,978	17%	$87,776	$79,148	24%
CO	$1,711	$2,327	8%	$1,791	$2,488	8%
CT	$17,954	$20,431	71%	$22,323	$25,679	89%
DE	$5,805	$5,064	56%	.	$5,225	57%
FL	$6,416	$5,343	5%	.	$6,632	6%
GA	$4,312	$3,990	8%	.	$4,945	9%
HI	$16,777	$13,763	106%	$24,008	$18,750	145%
IL	$33,295	$30,087	38%	.	$60,298	76%
IN	$288	$301	1%	$415	$438	1%
KY	$3,510	$3,472	11%	$4,710	$4,590	15%
LA	$7,076	$6,016	18%	.	$10,074	30%
MA	$16,401	$14,963	26%	$22,646	$20,413	36%
MD	$9,580	$8,418	20%	$12,509	$10,700	26%
ME	$1.981	$2.728	26%	$2.207	$3.130	29%
MI	$14,251	$11,968	19%	$18,092	$14,831	23%
MN	$693	$675	1%	$1,014	$982	2%
MO	$1,594	$2,020	5%	$1,761	$2,255	6%
NC	$30,339	$26,291	42%	$50,014	$42,917	68%
NH	$2,435	$2,279	27%	.	$2,519	30%
NJ	$71,372	$65,174	92%	$115,116	$102,002	144%
NM	$3,915	$3,830	19%	$5,602	$5,421	27%

Note. All values are for the 2011 fiscal year. For some states the GASB report upon which the liabilities are based pertain to the 2010 or 2012 fiscal years. In these cases, the liabilities are adjusted so as to be on a 2011 fiscal year basis.

Table 1 (cont.)
State Retiree Health Care Liabilities

State	Actuarial Accrued Liability (AAL)			Present Value of Benefits		
	Stated ($ millions)	EAN Methodology & 5% Discount Rate ($ millions)	EAN Methodology & 5% Discount Rate ($ per capita)	Stated ($ millions)	5% Discount Rate ($ millions)	5% Discount Rate ($ per capita)
	(1)	(2)	(3)	(4)	(5)	(6)
NV	$977	$826	5%	$1,769	$1,431	8%
NY	$39,268	$28,204	14%	$58,749	$39,000	19%
OH	$31,020	$31,014	31%	.	$37,947	39%
PA	$15,400	$14,876	16%	$20,243	$19,435	21%
RI	$937	$937	10%	$1,156	$1,156	12%
SC	$4,880	$4,880	15%	$6,062	$6,062	19%
TN	$1,476	$1,329	4%	$2,409	$2,096	6%
TX	$21,502	$23,388	17%	$31,181	$34,301	26%
UT	$481	$445	3%	$566	$525	3%
VA	$2,127	$2,736	5%	$2,388	$3,171	6%
VT	$1,012	$857	13%	.	$2,065	32%
WA	$6,936	$6,264	12%	$11,764	$10,368	21%
WI	$953	$843	2%	.	$948	2%
WV	$3,121	$3,644	24%	$3,768	$4,492	29%
US	**$456,196**	**$425,737**	**20%**	**$518,120**	**$610,073**	**29%**

Note. All values are for the 2011 fiscal year. For some states the GASB report upon which the liabilities are based pertain to the 2010 or 2012 fiscal years. In these cases, the liabilities are adjusted so as to be on a 2011 fiscal year basis.

Table 2
State and Local Retiree Health Care Liabilities

State	Local Scaling Factor	Actuarial Accrued Liability (AAL)		Present Value of Benefits	
		$ millions	% of State and Local Revenue	$ millions	% of State and Local Revenue
	(1)	(2)	(3)	(4)	(5)
IL	2.9	$117,638	85%	$235,766	171%
HI	0.0	$13,763	84%	$18,750	114%
CT	0.8	$35,841	85%	$45,047	107%
AK	0.4	$16,873	89%	$18,868	99%
NJ	0.0	$65,174	61%	$102,002	96%
NH	2.9	$8,875	72%	$9,809	80%
NC	0.5	$40,025	42%	$65,336	69%
MA	1.8	$41,842	49%	$57,084	67%
MI	2.8	$45,550	50%	$56,447	62%
MD	2.5	$29,586	46%	$37,605	59%
TX	2.7	$87,598	38%	$128,472	55%
AL	3.8	$16,021	40%	$20,261	51%
DE	0.0	$5,064	45%	$5,225	47%
NY	2.4	$96,266	29%	$133,116	41%
PA	1.8	$41,102	30%	$53,698	39%
OH	0.3	$39,643	29%	$48,506	36%
KY	2.2	$11,054	26%	$14,611	34%
LA	0.5	$8.825	18%	$14.778	30%
NM	0.4	$5,195	21%	$7,353	30%
GA	3.8	$19,264	21%	$23,874	27%
WV	0.0	$3,644	19%	$4,492	24%
CA	0.6	$90,895	17%	$126,262	23%
NV	3.0	$3,272	11%	$5,672	20%
SC	0.4	$6,892	15%	$8,560	18%
FL	3.9	$26,083	13%	$32,376	17%

Note. All values are for the 2011 fiscal year and are produced using a 5% discount rate. For some states the GASB report upon which the liabilities are based pertain to the 2010 or 2012 fiscal years. In these cases, the liabilities are adjusted so as to be on a 2011 fiscal year basis.

Table 2 (cont.)
State and Local Retiree Health Care Liabilities

State	Local Scaling Factor	Actuarial Accrued Liability (AAL)		Present Value of Benefits	
		$ millions	% of State and Local Revenue	$ millions	% of State and Local Revenue
	(1)	(2)	(3)	(4)	(5)
MO	2.7	$7,436	13%	$8,302	14%
MN	8.4	$6,327	10%	$9,197	14%
WA	0.0	$6,264	8%	$10,368	13%
AR	0.7	$2,810	10%	$2,888	10%
TN	1.8	$3,666	6%	$5,783	9%
WI	3.2	$3,504	6%	$3,940	6%
UT	1.7	$1,222	5%	$1,439	6%
VA	0.4	$3,770	5%	$4,370	6%
CO	0.0	$2,327	4%	$2,488	5%
IN	3.6	$1,369	2%	$1,992	3%
US	**2.1**	**$914,678**	**28%**	**$1,324,737**	**41%**

Note. All values are for the 2011 fiscal year and are produced using a 5% discount rate. For some states the GASB report upon which the liabilities are based pertain to the 2010 or 2012 fiscal years. In these cases, the liabilities are adjusted so as to be on a 2011 fiscal year basis.

Table 3
State and Local Retiree Health Care Liabilities Compared to Pension Liabilites

State	Unfunded Actuarial Accrued Liability (UAAL)			Present Value of Benefits		
	Retiree Health Care Liabilities	Pension Liabilities	(1) as a percent of (2)	Retiree Health Care Liabilities	Pension Liabilities	(5) as a percent of (6)
	(1)	(2)	(3)	(4)	(5)	(6)
AK	$16,873	$11,510	147%	$18,868	$27,023	70%
AL	$15,504	$27,500	56%	$20,261	$63,553	32%
AR	$2,810	$11,374	25%	$2,888	$39,888	7%
CA	$90,895	$405,657	22%	$126,262	$1,342,217	9%
CO	$2,045	$52,495	4%	$2,488	$128,860	2%
CT	$35,754	$37,934	94%	$45,047	$81,903	55%
DE	$4,901	$1,488	329%	$5,225	$11,356	46%
FL	$26,083	$46,005	57%	$32,376	$254,661	13%
GA	$19,264	$29,302	66%	$23,874	$117,858	20%
HI	$13,585	$12,219	111%	$18,750	$31,299	60%
IL	$117,638	$196,731	60%	$235,766	$391,468	60%
IN	$1,345	$18,330	7%	$1,992	$54,931	4%
KY	$8,621	$29,545	29%	$14,611	$65,386	22%
LA	$8,825	$33,325	26%	$14,778	$83,512	18%
MA	$40,862	$56,173	73%	$57,084	$140,684	41%
MD	$28,852	$38,341	75%	$37,605	$114,335	33%
MI	$45,550	$84,663	54%	$56,447	$181,858	31%
MN	$6.327	$41.341	15%	$9.197	$116.110	8%
MO	$7,129	$38,938	18%	$8,302	$121,567	7%
NC	$38,915	$12,279	317%	$65,336	$102,637	64%
NH	$8,875	$7,425	120%	$9,809	$17,219	57%
NJ	$65,174	$111,619	58%	$102,002	$248,512	41%
NM	$4,886	$17,316	28%	$7,353	$53,217	14%
NV	$3,153	$13,332	24%	$5,672	$50,472	11%
NY	$96,266	$203,253	47%	$133,116	$648,943	21%

Note. All values are for the 2011 fiscal year. For some states the GASB report upon which the liabilities are based pertain to the 2010 or 2012 fiscal years. In these cases, the liabilities are adjusted so as to be on a 2011 fiscal year basis. The UAAL for pension liabilities is based on the ABO actuarial methodology, while the UAAL for retiree health is based on the EAN methodology. The discrepancy reflects data availability. Novy-Marx and Rauh (2009), Table V, show that the ABO is, on average, 88 percent of the size of the EAN for state pension liabilities. We therefore inflate the ABO liabilities to account for this mean difference.

Table 3 (cont.)
State and Local Retiree Health Care Liabilities Compared to Pension Liabilites

State	Unfunded Actuarial Accrued Liability (UAAL)			Present Value of Benefits		
	Retiree Health Care Liabilities	Pension Liabilities	(1) as a percent of (2)	Retiree Health Care Liabilities	Pension Liabilities	(5) as a percent of (6)
	(1)	(2)	(3)	(4)	(5)	(6)
OH	$24,820	$113,943	22%	$48,506	$325,031	15%
PA	$40,741	$100,486	41%	$53,698	$225,445	24%
SC	$6,581	$33,144	20%	$8,560	$69,838	12%
TN	$3,666	$17,777	21%	$5,783	$78,163	7%
TX	$87,598	$106,003	83%	$128,472	$381,436	34%
UT	$929	$11,577	8%	$1,439	$43,255	3%
VA	$3,505	$55,279	6%	$4,370	$164,436	3%
WA	$6,264	$26,651	24%	$10,368	$113,740	9%
WI	$3,504	$17,368	20%	$3,940	$121,855	3%
WV	$3,172	$10,318	31%	$4,492	$25,456	18%
US	**$890,911**	**$2,075,220**	**43%**	**$1,324,737**	**$6,161,794**	**21%**

Note. All values are for the 2011 fiscal year. For some states the GASB report upon which the liabilities are based pertain to the 2010 or 2012 fiscal years. In these cases, the liabilities are adjusted so as to be on a 2011 fiscal year basis. The UAAL for pension liabilities is based on the ABO actuarial methodology, while the UAAL for retiree health is based on the EAN methodology. The discrepancy reflects data availability. Novy-Marx and Rauh (2009), Table V, show that the ABO is, on average, 88 percent of the size of the EAN for state pension liabilities. We therefore inflate the ABO liabilities to account for this mean difference.

Table 4
State and Local Retiree Health Care Liabilities under Various Discount Rates

State	Actuarial Accrued Liability (AAL)			Present Value of Benefits		
	3 Percent Discount Rate	5 Percent Discount Rate	7 Percent Discount Rate	3 Percent Discount Rate	5 Percent Discount Rate	7 Percent Discount Rate
	(1)	(2)	(3)	(4)	(5)	(6)
AK	$25,010	$16,873	$12,118	$28,649	$18,868	$13,290
AL	$22,937	$16,021	$11,825	$30,843	$20,261	$14,266
AR	$4,028	$2,810	$2,068	$4,120	$2,888	$2,131
CA	$131,573	$90,895	$66,402	$196,493	$126,262	$87,042
CO	$2,981	$2,327	$1,882	$3,254	$2,488	$1,982
CT	$54,419	$35,841	$25,278	$70,848	$45,047	$30,846
DE	$7,195	$5,064	$3,770	$7,398	$5,225	$3,896
FL	$38,179	$26,083	$18,931	$50,115	$32,376	$22,512
GA	$26,852	$19,264	$14,585	$35,378	$23,874	$17,241
HI	$20,142	$13,763	$9,994	$30,041	$18,750	$12,708
IL	$181,419	$117,638	$82,051	$443,160	$235,766	$140,770
IN	$2,013	$1,369	$992	$3,193	$1,992	$1,346
KY	$15,326	$11,054	$8,417	$21,838	$14,611	$10,510
LA	$12,400	$8,825	$6,638	$22,430	$14,778	$10,437
MA	$61,926	$41,842	$30,093	$88,961	$57,084	$39,419
MD	$42,252	$29,586	$21,878	$56,548	$37,605	$26,686
MI	$65,666	$45,550	$33,534	$85,783	$56,447	$40,096
MN	$7.903	$6.327	$5.194	$12.096	$9.197	$7.236
MO	$10,741	$7,436	$5,461	$12,199	$8,302	$6,014
NC	$60,040	$40,025	$28,583	$100,553	$65,336	$45,439
NH	$12,694	$8,875	$6,570	$14,200	$9,809	$7,192
NJ	$96,231	$65,174	$47,070	$171,599	$102,002	$66,402
NM	$8,081	$5,195	$3,610	$12,385	$7,353	$4,783
NV	$4,651	$3,272	$2,432	$8,828	$5,672	$3,923
NY	$136,353	$96,266	$72,131	$203,197	$133,116	$94,068

Note. All values are for the 2011 fiscal year. For some states the GASB report upon which the liabilities are based pertain to the 2010 or 2012 fiscal years. In these cases, the liabilities are adjusted so as to be on a 2011 fiscal year basis. The AAL liabilities are produced using the EAN methodology.

Table 4 (cont.)
State and Local Retiree Health Care Liabilities under Various Discount Rates

State	Actuarial Accrued Liability (AAL)			Present Value of Benefits		
	3 Percent Discount Rate	5 Percent Discount Rate	7 Percent Discount Rate	3 Percent Discount Rate	5 Percent Discount Rate	7 Percent Discount Rate
	(1)	(2)	(3)	(4)	(5)	(6)
OH	$56,361	$39,643	$29,639	$72,976	$48,506	$34,743
PA	$55,343	$41,102	$31,882	$76,387	$53,698	$39,962
SC	$9,931	$6,892	$5,079	$12,971	$8,560	$6,061
TN	$4,557	$3,666	$3,024	$7,720	$5,783	$4,496
TX	$127,654	$87,598	$63,893	$197,051	$128,472	$89,833
UT	$1,699	$1,222	$917	$1,984	$1,439	$1,088
VA	$5,066	$3,770	$2,931	$6,121	$4,370	$3,292
WA	$9,653	$6,264	$4,356	$17,542	$10,368	$6,660
WI	$4,521	$3,504	$2,811	$5,123	$3,940	$3,139
WV	$5,058	$3,644	$2,776	$6,554	$4,492	$3,295
US	**$1,330,852**	**$914,678**	**$668,815**	**$2,118,539**	**$1,324,737**	**$902,804**

Note. All values are for the 2011 fiscal year. For some states the GASB report upon which the liabilities are based pertain to the 2010 or 2012 fiscal years. In these cases, the liabilities are adjusted so as to be on a 2011 fiscal year basis. The AAL liabilities are produced using the EAN methodology.

Table 5

State and Local Retiree Health Care Liabilities Under CBO's Excess Medical Cost Growth Assumptions

State	Actuarial Accrued Liability (AAL)			Present Value of Benefits		
	State Excess Cost Growth Assumptions	CBO Excess Cost Growth Assumption	Percent Difference Between (2) and (1)	State Excess Cost Growth Assumptions	CBO Excess Cost Growth Assumption	Percent Difference Between (2) and (1)
	(1)	(2)	(3)	(4)	(5)	(5)
AK	$16,873	$13,892	-18%	$18,868	$15,386	-18%
AL	$16,021	$14,529	-9%	$20,261	$18,292	-10%
AR	$2,810	$1,975	-30%	$2,888	$2,705	-6%
CA	$90,895	$80,067	-12%	$126,262	$112,032	-11%
CO*	$2,327	N/A	N/A	$2,488	N/A	N/A
CT	$35,841	$31,502	-12%	$45,047	$39,489	-12%
DE	$5,064	$4,041	-20%	$5,225	$4,849	-7%
FL	$26,083	$19,623	-25%	$32,376	$23,702	-27%
GA	$19,264	$16,900	-12%	$23,874	$20,841	-13%
HI	$13,763	$11,196	-19%	$18,750	$15,064	-20%
IL	$117,638	$88,896	-24%	$235,766	$165,462	-30%
IN	$1,369	$1,152	-16%	$1,992	$1,689	-15%
KY	$11,054	$8,682	-21%	$14,611	$12,793	-12%
LA	$8,825	$8,213	-7%	$14,778	$12,532	-15%
MA	$41,842	$36,476	-13%	$57,084	$49,522	-13%
MD	$29,586	$25,838	-13%	$37,605	$32,655	-13%
MI	$45,550	$45,432	0%	$56,447	$58,010	3%
MN	$6.327	$5.197	-18%	$9.197	$7.645	-17%
MO	$7,436	$6,020	-19%	$8,302	$7,280	-12%
NC	$40,025	$35,167	-12%	$65,336	$57,345	-12%
NH	$8,875	$5,154	-42%	$9,809	$8,356	-15%
NJ	$65,174	$56,058	-14%	$102,002	$86,649	-15%
NM	$5,195	$3,844	-26%	$7,353	$5,330	-28%
NV	$3,272	$2,593	-21%	$5,672	$4,438	-22%
NY	$96,266	$89,134	-7%	$133,116	$123,400	-7%

Note. All values are for the 2011 fiscal year and are produced using a 5% discount rate. For some states the GASB report upon which the liabilities are based pertain to the 2010 or 2012 fiscal years. In these cases, the liabilities are adjusted so as to be on a 2011 fiscal year basis. The AAL liabilities are produced using the EAN methodology. * Colorado and Virginia provide retirees with a fixed subsidy for health care. As a result their liabilities are not dependent upon medical cost inflation.

Table 5 (cont.)
State and Local Retiree Health Care Liabilities Under CBO's Excess Medical Cost Growth Assumptions

State	Actuarial Accrued Liability (AAL)			Present Value of Benefits		
	State Excess Cost Growth Assumptions	CBO Excess Cost Growth Assumption	Percent Difference Between (2) and (1)	State Excess Cost Growth Assumptions	CBO Excess Cost Growth Assumption	Percent Difference Between (2) and (1)
	(1)	(2)	(3)	(4)	(5)	(5)
OH	$39,643	$39,528	0%	$48,506	$49,677	2%
PA	$41,102	$30,884	-25%	$53,698	$40,063	-25%
SC	$6,892	$6,314	-8%	$8,560	$7,874	-8%
TN	$3,666	$3,004	-18%	$5,783	$4,690	-19%
TX	$87,598	$71,969	-18%	$128,472	$103,923	-19%
UT	$1,222	$1,409	15%	$1,439	$1,587	10%
VA*	$3,770	N/A	N/A	$4,370	N/A	N/A
WA	$6,264	$4,399	-30%	$10,368	$6,849	-34%
WI	$3,504	$2,470	-29%	$3,940	$3,461	-12%
WV	$3,644	$2,896	-21%	$4,492	$5,730	28%
US	**$914,678**	**$783,158**	**-14%**	**$1,324,737**	**$1,125,925**	**-15%**

Note. All values are for the 2011 fiscal year and are produced using a 5% discount rate. For some states the GASB report upon which the liabilities are based pertain to the 2010 or 2012 fiscal years. In these cases, the liabilities are adjusted so as to be on a 2011 fiscal year basis. The AAL liabilities are produced using the EAN methodology. * Colorado and Virginia provide retirees with a fixed subsidy for health care. As a result their liabilities are not dependent upon medical cost inflation.

Table 6
Projected Demographic Change

Percentage Change in Population Shares from 2009-2030

	(1) Kids	(2) Adults	(3) Elderly		(1) Kids	(2) Adults	(3) Elderly
AK	5%	-14%	87%	MT	-10%	-14%	75%
AL	-5%	-10%	53%	NC	2%	-10%	44%
AR	-2%	-10%	43%	ND	-7%	-14%	66%
AZ	-5%	-12%	62%	NE	-1%	-12%	51%
CA	-7%	-7%	57%	NH	-5%	-12%	68%
CO	2%	-11%	57%	NJ	-6%	-8%	48%
CT	-5%	-10%	51%	NM	-12%	-16%	92%
DE	-7%	-13%	69%	NV	0%	-11%	54%
FL	-7%	-14%	54%	NY	-5%	-9%	49%
GA	-1%	-9%	57%	OH	-5%	-9%	50%
HI	-6%	-12%	60%	OK	0%	-10%	42%
IA	-6%	-10%	51%	OR	0%	-9%	41%
ID	-7%	-8%	55%	PA	-4%	-10%	46%
IL	-3%	-8%	46%	RI	-6%	-10%	52%
IN	-1%	-9%	43%	SC	-7%	-12%	65%
KS	-4%	-10%	52%	SD	-2%	-14%	60%
KY	-5%	-9%	53%	TN	1%	-11%	46%
LA	-7%	-9%	58%	TX	-2%	-8%	50%
MA	-4%	-10%	54%	UT	-4%	-5%	48%
MD	0%	-9%	46%	VA	-1%	-10%	54%
ME	-12%	-14%	72%	VT	-8%	-14%	74%
MI	-7%	-8%	53%	WA	-3%	-9%	51%
MN	-2%	-10%	54%	WI	-5%	-11%	60%
MO	-4%	-9%	47%	WV	-11%	-11%	56%
MS	-11%	-8%	63%	WY	-15%	-15%	94%
TOTAL	**-4%**	**-10%**	**52%**				

Table 7
Changes in the Adult Population and Projected GDP

	Cumulative Percent Change in Adult Population 2011-2030	Average Annual Growth Rate of Adult Population 2011-2030	Average Annual Nominal GDP Growth Rate 2011-2030		Cumulative Percent Change in Adult Population 2011-2030	Average Annual Growth Rate of Adult Population 2011-2030	Average Annual Nominal GDP Growth Rate 2011-2030
	(1)	(2)	(3)		(1)	(2)	(3)
AK	7%	0.4%	4.6%	MT	-8%	-0.4%	3.8%
AL	-5%	-0.2%	3.9%	NC	16%	0.8%	5.0%
AR	1%	0.1%	4.3%	ND	-18%	-1.0%	3.2%
AZ	39%	1.8%	5.9%	NE	-9%	-0.5%	3.7%
CA	11%	0.6%	4.8%	NH	3%	0.2%	4.4%
CO	6%	0.3%	4.5%	NJ	-1%	0.0%	4.2%
CT	-8%	-0.4%	3.8%	NM	-11%	-0.6%	3.6%
DE	-1%	0.0%	4.2%	NV	39%	1.8%	5.9%
FL	26%	1.3%	5.4%	NY	-9%	-0.5%	3.7%
GA	12%	0.6%	4.8%	OH	-10%	-0.5%	3.7%
HI	-4%	-0.1%	4.0%	OK	-2%	-0.1%	4.1%
IA	-12%	-0.6%	3.5%	OR	15%	0.8%	4.9%
ID	18%	0.9%	5.1%	PA	-10%	-0.5%	3.7%
IL	-5%	-0.2%	3.9%	RI	-8%	-0.4%	3.8%
IN	-3%	-0.1%	4.0%	SC	2%	0.1%	4.3%
KS	-6%	-0.3%	3.9%	SD	-13%	-0.7%	3.5%
KY	-3%	-0.2%	4.0%	TN	5%	0.3%	4.5%
LA	-6%	-0.3%	3.9%	TX	23%	1.1%	5.3%
MA	-6%	-0.3%	3.9%	UT	25%	1.2%	5.4%
MD	7%	0.4%	4.5%	VA	9%	0.5%	4.6%
ME	-11%	-0.5%	3.6%	VT	-7%	-0.3%	3.9%
MI	-7%	-0.3%	3.9%	WA	19%	0.9%	5.1%
MN	3%	0.2%	4.4%	WI	-5%	-0.2%	3.9%
MO	-2%	-0.1%	4.1%	WV	-16%	-0.9%	3.3%
MS	-5%	-0.2%	3.9%	WY	-14%	-0.8%	3.4%
TOTAL	**5%**	**0.3%**	**4.4%**				

Table 8
Effects of Demographic Change on State Medicaid Spending

	Effect of Aging in 2030 Relative to 2009	Share of FY 2009 State Medicaid Spending Allocated to Each Group		
		Kids	Adults	Elderly
	(1)	(2)	(3)	(4)
AK	9%	32%	52%	16%
AL	6%	28%	48%	24%
AR	5%	23%	53%	25%
AZ	-3%	24%	65%	11%
CA	9%	19%	55%	26%
CO	7%	24%	53%	22%
CT	9%	17%	53%	30%
DE	3%	22%	60%	17%
FL	3%	21%	57%	22%
GA	5%	27%	56%	17%
HI	7%	17%	58%	24%
IA	4%	20%	59%	22%
ID	3%	22%	62%	16%
IL	2%	28%	57%	16%
IN	3%	21%	59%	20%
KS	5%	22%	57%	21%
KY	2%	23%	61%	16%
LA	2%	22%	61%	16%
MA	8%	19%	55%	26%
MD	4%	19%	60%	21%
ME	7%	22%	55%	23%
MI	4%	23%	57%	19%
MN	6%	20%	58%	22%
MO	2%	28%	54%	18%
MS	6%	22%	56%	21%
TOTAL	**6%**	**21%**	**56%**	**23%**

Table 8 (continued)
Effects of Demographic change on State Medicaid Spending

	Effect of Aging in 2030 Relative to 2009	Share of FY 2009 State Medicaid Spending Allocated to Each Group		
		Kids	Adults	Elderly
	(1)	(2)	(3)	(4)
MT	10%	24%	50%	26%
NC	1%	24%	60%	16%
ND	12%	18%	52%	30%
NE	5%	27%	50%	23%
NH	11%	26%	48%	26%
NJ	9%	19%	51%	30%
NM	-8%	41%	53%	6%
NV	2%	30%	55%	15%
NY	9%	13%	57%	30%
OH	5%	16%	62%	23%
OK	2%	28%	55%	17%
OR	5%	18%	57%	25%
PA	7%	18%	53%	30%
RI	6%	20%	57%	24%
SC	3%	23%	59%	18%
SD	4%	27%	53%	20%
TN	1%	25%	60%	15%
TX	4%	37%	47%	16%
UT	1%	29%	61%	11%
VA	4%	26%	55%	19%
VT	9%	22%	53%	25%
WA	5%	23%	57%	20%
WI	9%	15%	58%	27%
WV	3%	19%	61%	20%
WY	7%	27%	53%	20%

Table A1: Local Government Scaling

	State GASB Report Captures			Scaling				
State	teachers	non-education local employees		teacher: based on liabilities in teacher OPEB report or CAFR	teacher: based on census employee counts	local non-ed.: based on census employee counts	general: based on supplememtal sources	Notes
AL				2.69		x		The 2011 AAL for teacher retiree health care is equal to 9,081,334,485, compared to a state reported retiree health care AAL of 3,369,896,864: ratio of 2.7. The state report is for the State Employee's Health Insurance Plan (SEHIP). The state also has a Local Government Health Insurance Plan (LGHIP). The LGHIP website states that it provides retiree health coverage in some cases: "An active employee who retires from a unit that allows retirees to continue coverage has the option of electing retiree coverage or COBRA." https://www.alseib.org/healthinsurance/lghip/FAQ.aspx
AK		x		0.41				The state report captures all state workers and the vast majority of non-education local workers. The Teacher's Retirement Systemt (TRS) CAFR gives an AAL of $3,076,288,000 for workers hired before 2006. For those hired after 2006, and whom are on a different retiree health care plan, the AAL equals $2,809,000. Thus, the total AAL for retiree health care is $3,079,097,000. Given the state AAL of $7,428,905,000, this implies a scaling factor of 0.41.
AZ								
AR							0.67	State GASB repot covers state employees and some local workers, including some school district employees. It does not cover any teachers. State retiree health care is linked to receipt of a pension from the state pension system (PERS). PERS had 45,200 active members actives in 2011 relative to 134,995 activemembers for all the state's pension plans according to the Census Bureau. Thus, we use an overall scaling factor of (134, 995 - 45, 200) / 134, 995 = 0.67.
CA							0.60	State GASB report captures most state employees (although excludes higher-ed. employees outside of CSU system -- e.g. the UC system and community colleges are excluded). Supplemental Source for general scaling: "Funding Pensions & Retiree Health Care for Public Employees: A Report of the Public Employee Post-Employee Benefits Commision," State of California, 2008. The report (table 3) calculates the UAAL for all retiree health liabilities in the state. The calculations suggest that the State GASB report captures 40 percent of total state and local government retiree health liabilities. A scaling factor of 0.60 is therefore applied to the liability streams calculated from the state GASB report. (Table 6 of the report shows that only 14 percent of total state and local retiree health liabiliteis are pre-funded, making the UAAL based scaling factor a reasonable approximation.)
CO	x	x						The state GASB report captures most state and local employees. Retiree health insurance in linked to receipt of a pension benefit from the state pension sysytem -- PERA. PERA membership include: "employees of the Colorado state government, public school teachers in the state, many university and college employees, judges, many employees of cities and towns, state troopers, and the employees of a number of other public entities." (https://www.copera.org/pera/about/overview.htm)
CT				0.17		x		The state GASB report only covers state government employees. The state report does refer to individuals covered by the State Teacher's Retirement System. A phone conversation with Thomas Woodruff, Healthcare Policy & Benefits Service Division, Office of the State Comptroller, indicates that this refers to a very small number of state employees covered by the Teacher's Retirement System. In general, teachers are covered by their own plan and are not captured in the state report. Dr. Woodruff also confirmed that local non-education employees receive retiree health care directly from local governments and are not captured in the state report. The State Teacher's Retirement System GASB OPEB report suggests an AAL of $3,023,082,000 for 2011. (This ia an average of the reported 2010 and 2012 AAL provided by the report. The STRS report is for fiscal year 2012, while the state OPEB report is for fiscal 2011.) Given the state reported AAL of nearly $18 billion, this yields a teacher scaling factor of 0.17. The teacher AAL is relatively low because it only refers to the provision of a Medicare supplement plan. Prior to Medicare, retired teachers may obtain health care from their former districts, but pay 100 percent of the cost.
DE	x	x						State GASB report appears to cover all local government workers (including teachers) with the exception of a couple of very small groups such as volunteer firefighters.
FL					x	x		The state GASB report covers the provision of retiree heatlh care under the State Group Insurance Plan (GSP). Eligibility for GSP health insurance as a retiree is contingent on qualifying for a pension benefit from the Florida Retirement System (FRS). Although the FRS covers local employess (including teachers), the GSP health insurance *only* applies to state employees. Moroever, the number of active employees in the state GASB report is much too small to include local workers. (The state GASB report counts 159,407 active employees in the GSP plan. There are 326,753 k-12 employees and 168,583 state employees.) The exclusion of local workers (both K-12 and non-ed.) was confirmed in a telephone call with Sally Wade, an employee of the Florida State Group Insurance Plan. The provision of retiree health care at the local level is handled by the individual governments with varying levels of subsidy according to a telephone conversation with Gary Green of the FRS.
GA	x			2.58		x		The state GASB report is two reports appended together: one for state workers and one for k-12 personnel. We calculated annual liabilities for the state workers. The school personnel report indicates that the retire health care AAL is equal to 2.6 times the state retiree health care AAL.
HI	x	x						Report covers all state and local government workers.
ID								

Table A1: Local Government Scaling

	State GASB Report Captures			Scaling				
State	teachers	non-education local employees		teacher: based on liabilities in teacher OPEB report or CAFR	teacher: based on census employee counts	local non-ed.: based on census employee counts	general: based on supplememtal sources	Notes
IL							2.91	We collected three state-wide GASB OPEB reports. The first report , which is the basis of our cash flow projections, covers state employees other than some "college" employees. The second report covers these college workers and the third report covers k-12 teachers. These second two reports contain AALs jointly equal to 63 percent of the AAL in the first report. Local non-education workers are not covered in these three reports. We collected information on the AALs of both the City of Chicago and Cook County. The remaining non-teacher local workers (e.g. excluding Chicago and Cook County) were handled using a scaling factor equal to the ([number of local non-primary and secondary education instructional workers in Illinois] - [number of City of Chicago and Cook County non-primary and secondary education instructional workers]) / number of state workers = 1.9. Employee counts refer to full-time workers as measured by the Census Bureau. The provision of retiree health benefits in the City of Chicago is subject to the provisions of the settlement of City of Chicago v. Korshak. The agreement expires on June 30, 2013 and the city's CAFR statement values the OPEB obligations assuming the termination of the benefit on this date. This is not consistent with our current policy assumption. We therefore use the AAL reported by the Retiree Healthcare Benefits Commission (RHBC). (The RHBC was created as a condition of the settlement agreement.) The AAL equals $10.9 billion and assumes that the benefits which have been provided under the settlement agreement continue indefinitely. (Report to the Mayor's Office on the State of Retiree Healthcare, Retiree Healthcare Benefits Commission, January 11, 2013; http://www.cityofchicago.org/city/en/depts/fin/provdrs/ben/alerts/2013/jan/retiree_healthcarebenefitscommissionreporttothemayor.html) (In May 2013 Chicago announced it was terminating the subsidy for retiree health care. As this occurred after our "base" fiscal year of 2011 we do not account for this termination.) The Cook County Employee's Annuity and Benefit Fund reports an AAL of $1.1 billion for retiree health benefits. However, this was computed using a 7.5% discount rate. We utilize the $1.7 billion AAL, calculated under a 4.5% discount rate (the same used by the state GASB report used as the basis of the cash flows for the state), reported in Status of Local Pension Funding Fiscal Year 2011: An Evaluation of Ten Local Government Employee Pension Funds in Cook County, The Civic Federation, May 21, 2013. The City of Chicago and Cook County have a combined retiree health care AAL of 12.6 billion, equal to 38 percent of the state GASB report AAL. The total scaling factor for the state is equal to the two
IN					x	x	0.24	The state GASB report covers all state employee, but is basically two separate reports: one for state police and one for everyone else. The state police account for 76% of the total present value of the retiree health care liablities. As a result, we generated the cash flows from the state police portion of the report and then scale up these cash flows by a 0.24 factor. (Retiree health benefits to non-police employees , other than the legislature and conservation and excise police which are distinct from state police, are relatively small as there is no explicit subsidy.) The state report does not cover teachers or other local employees. A phone conversation with Nancy Tolson, Executive Director of the Indiana Retired Teachers Association, indicates that teacher retiree health care is handled on a district-by-district basis. Some districts do not even offer access to their health plans to retirees and those that do almost never provide a subsidy. The local scaling up is based upon the full state cash flows (i.e. the state police cash flows scaled up to reflect all state government employees.)
IA								
KS								
KY							2.18	The state GASB report does not cover state police, teachers or non-education local workers (who are covered under the "County" retirement system.) We obtained a separate GASB report for each of these groups. The ratio of each groups retiree health care AAL to the state retiree health care AAL is: 9.5% (state police), 106.4% (local non-ed. worker) and 102.4% (k-12 employees). Thus, the total scaling factor is 2.18.
LA	x					x		The state GASB report covers the following workers: state, teachers, other school and state police. Based on a phone coversation with an employee of the statewide municipal pension fund (MERS: 800-820-1137; www.mersla.com) individual local governments typically provide coverage, but not universally as some of the very small governments do not.
ME								
MD					x	x		The state GASB report, following a discussion of eligibility for retiree health benefits, has an unlabeled table listing several state pension systems. The Teacher's Retirement System is listed in the table. However, the count of active members in the state GASB report appear much too small to include teachers. This was confirmed by a conversation with a staff member of the Legislation and Research Division of the Maryland State Retirement and Pension System who indicated that the state did not provide retiree health benefits to any K-12 teachers in the state of Maryland.
MA							1.80	A report by a special commission on retiree health benefits estimates that the retiree health care AAL for the state's municipalities is $30 billion, equal to 1.8 times the state government's retiree health AAL. The report suggests that only the state and municipal governments provide retiree health care in Massachusetts. "The Commonwealth of Massachusetts Special Commission to Study Retiree Healthcare and Other Non-Pension Benefits Final Report", Submitted January 11, 2013. (http://www.mass.gov/anf/docs/anf/opeb-commission/opeb-commission-final-report.pdf) The Public Employee Retirement Administration Commission (a state government entity which oversees the 105 retirement sytems in the state) website states the following in regards to local government retiree health care: "While continuation of insurance coverage for retirees is an optional matter for the various governmental units in the Commonwealth, most cities and towns have accepted the necessary provisions of the law which permit them to be able to provide this service. (http://www.mass.gov/perac/guide/mainguide28.htm)

Table A1: Local Government Scaling

	State GASB Report Captures			Scaling				
State	teachers	non-education local employees		teacher: based on liabilities in teacher OPEB report or CAFR	teacher: based on census employee counts	local non-ed.: based on census employee counts	general: based on supplememtal sources	Notes
MI				1.90		x		2012 school retirement fund CAFR shows a 2011 OPEB AAL of $14,496,000,000 for retirees and $12,550,000,000 for actives = $27,046,000,000. As the state declared AAL equals $14,251,103,792, the scaling ratio equals 1.90.
MN				2.91			5.46	The state report only covers state workers and excludes state higher education workers. The GASB report for state higher ed. employees (the Minnesota State Colleges and Universities Postretirement Medical Plan Actuarial Valuation) shows a present value of future benefits of $163,925,000. Given the state present value of $1,013,680,000, we use a scaling factor of 0.16 to account for the state higher ed. employees. K-12 educational employee OPEB obligations are based on "Special Study: Other Postemployment Benefit Liabilities of School Districts in Minnesota", Government Information Division, Office of the State Auditor, State of Minnesota, March 31, 2009. The report contains the results of a survey of the declared GASB OPEB liabilites of school distircts in the state (see Table 6). The total AAL for responding districts was $1,404,530,364. The only measure of district size given is operating revenues. The total of these revenues for the reporting districts was $5,978,186,071. The Census Bureau's Public Elementary-Secondary Education Finance Data reports $8,599,468,000 in total current spending in the fiscal year to which the state report refers in Minnesota. (The Census total current spending category matches up conceptualy well with the state reported total operating revenues. They also match up well in dollar terms on a district-by-district basis.) We gross-up the reported AAL by 1.44 ($8,599,468,000 / $5,978,186,071) to obtain an AAL of $2,020,381,062. The state GASB report has an AAL of $693,297,000. Thus, to account for K-12 local workers we use a scaling factor of 2.91 ($2,020,381,062 / $693,297,000). Finally, for local non-education workers we use data on GASB declared OPEB liabilities from non-ed. local governments in Minnesota tabulated in a web appendix to Wirtz, Ronald, "OPEBs: What lies beneath the balance sheet" FedGazette, Minneapolis Federal Reserve, April 2011. The web appendix has data for 18 local governments and reports a total OPEB AAL for these entities of $1,665,069,714. The Census Bureau data on public employment shows these governments have 33,115 employees. As total local, non-ed. public employment is 73,119 in Minnesota, we gross up the reported AAL by 2.21 (73, 119 / 33, 115) to obtain an AAL of 3,676,528,232. The state GASB report has an AAL of 693,297,000. Thus, to account for local non-ed. workers we use a scaling factor of 5.30. The general scaling factor reported in the table is the sum of the local non-ed. scaling factor and the state higher ed. scaling
MS								
MO					x	x		The state GASB report covers only state employees. Although "state" employees who are receceving a pension from the teacher's pension system (PSRS) are eligible for retiree heatlh care from the state, almost all k-12 employees are employed by local governments, not the state. These local k-12 retirees receieve, by law, retiree health from the local government which had previously employed them (see https://www.psrsmo.org/PSRS/HealthInsurance.html for teachers and https://www.psrsmo.org/PEERS/HealthInsurance.html for non-teacher education retirees).
MT								
NE								
NV					x	x		The state - local breakdown in Nevada is unusually complcaietd. From 2003 - 2007 non-state public retirees could opt for the state retiree health plan. The state plan picked up a number of local employees (i.e. they opted out of their local plans to join the state plan). Actives in the 2011 GASB report are nearly 100 percent state employees. Local public retirees currently receive health care directly from the local government for whom they worked. The above information was provided by Celestina Glove, the CFO of the Public Employee's Benefits Program, State of Nevada. Given that local retirees could only opt in over a five year window and that all of the actives are state employees, we treat the state report as if it pertains only to state employees. This will slighly overstate total state and local liability, but the bias should be small, particurarly as actives account for 70% of the present value of liabilites.
NH								The state GASB report covers only state employees. The report states that retired employees receiving a pension benefit from the New Hampshire Retirement System who meet "certain requirements" are eligible for the state retiree health care benefit. This includes Group 1 retirees -- a group which includes teachers. However, the count of actives in the GASB report, 11, 514, is too small to cover both state workers and teachers (there were 31, 499 full-time local education workers in the same year and 15, 548 full-time state workers). A coversation with the staff of the Risk Management Unit of the Department of Administrative Services, State of New Hampshire confirms that only retired state employees are eligible for the state retiree health care plan. Local workers, both education and non-education, are not covered.
NJ	x	x						State report covers all state and local public employees.
NM	x	x*					0.36	The state GASB report covers all state and all k-12 employees. It also covers "participating" local employers. Collectively the two pension funds (PERA and ERB) which provide the retiree health benefits covered in the state report have 122,188 active members according to their 2012 CAFRS. This accounts for essentially the entire universe of NM active public pension plan members captured in the Census Bureau pension plan data. The state GASB report captures 90,083 actives. We therefore infer that there are 32, 105 local employees whose employer have opted not to participate in the state retiree heatlh plan and assume they are providing this benefit at the local level instead. The local gross up factor is therefore (32, 105 / 90, 083) = 0.36.

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NY	x					2.41	State GASB Report includes state workers, including the SUNY system, and some local government workers. New York City's GASB report shows a UAAL (they have no pre-funding) equal to 115 percent of the state reported UAAL. E.J. Mahon, "Iceberg Ahead: The Hidden Cost of Public-Sector Retiree Health Benefits in New York," Empire Center For New York State Policy, September 2012 catalogs the declared UAAL liabilities for 87 local governments and provides an estimate for the remaining local governments (the estimated portion comprises 15 percent of the non-state, non-NYC reported total UAAL). These liabilities are equal to 127 percent of the state reported liability. The total scaling factor used is therefore 2.41.
NC	x				x		State report covers state workers and teachers.
ND							
OH		x	0.28				State GASB report includes state and local workers excluding teachers. The2011 teachers retirement system CAFR reports a retiree health care AAL equal to 27 percent of the state reported retiree health care AAL.
OK							
OR							
PA				x		0.14	The state report covers only state employees. The Public School Employee's Retirement System (PSERS) Actuarial Valuation for 2011 (which values both pension and OPEB liabilities) shows an AAL of $1,339,444,000. Given the state reported AAL of $15,400,070,000, this implies a scaling factor of 0.087 for education workers. However, the PSERS OPEB valuation refers to a Premium Assistance (PA) program available to retirees with out-of-pocket premium expenses for health insurance through the PSERS health insurance coverage (which is funded 100% from retiree premiums including funds from the Premium Assistance Program) or from a school district's group health plan. (http://www.psers.state.pa.us/premiumasst.htm) According to James McAneny, Executive Director of the Public Employee Retirement Commission (PERC), Commonwealth of Pennsylvania (www.perc.state.pa.us), almost all school districts provide funding for retiree health care over and above the state funded PA program. This is done on a district-by-district basis and their is no systematic collection of the size of these liabilities. As a result, we scale up for education employees based on census employee counts and thereby implicitly assume that the school districts set their level of retiree health care benefits such that when they are added to the state PA program, the total benefit is equivalent to the benefit provided to state workers. (I.e. we do not use the 0.087 scaliong factor.) Local, non-education, retiree health is handled solely by each individual government. PERC conducted a survey of all municipal OPEB liabilities in the state. Although the results are unpublished, PERC generously shared the underlying data. Municipalities with 63, 475 active pension members responded with information on their OPEB AAL's which totaled $1,060,000,000. (The active counts come from PERC data on pension liabilities.) Accounting for 58, 645 active pension members at the County level and an additional 10, 499 actives whose employers either did not respond to the survey or failed to provide a AAL value, the total non-education local AAL scales to $2,215,000,000. Given the state reported AAL of $15,400,070,000, this implies a scaling factor for these
RI	x						
SC	x				x		The state GASB report is unusually clear about who is, and is not, covered by the retiree health insurance evaluated: "For the State of South Carolina, these benefits primarily include medical, prescription drug and dental insurance benefits provided to all eligible State and School District retirees, and also include the basic long term disability benefits provided to State employees, School District employees, and employees for Local Political Subdivisions. Any other OPEB benefits offered to the employees of the State of South Carolina are outside the scope of this report." Thus, the retiree health care in the state report covers state and local school employees, but not non-education employees.
SD							
TN						1.76	The Tennesse Department of Finance and Administration, Division of Accounts, provides a summary of all public OPEB obligations in the state (http://www.tn.gov/finance/act/OPEB.shtml). There are four plans in total: State Plan (the basis of our cash flow projections), Teacher Plan, Tennessee Plan (Medicare Supplement Plan which is separate from the State plan) and the Local Government Plan. The respective ratios of plan UAAL to the UAAL for the State Plan are: 0.69 (Teacher Plan), 0.33 (Tennessee Plan), and 0.06 (Local Government Plan). All four plans are unfunded and these ratios cannot there be thought of as based on the relative AALs. (The Local Plan AAL reported on the above state website excludes some of the obligations and the above ratio is therefore based upon the AAL value in the July 1, 2011 Local Plan OPEB report.)
TX			1.34		x		Teachers 2011 GASB shows 681,457 actives and a UAAL of $28,894,299 (5.25% discount rate). Given the state AAL of $21,502,434,000, this yields a scalng factor of 1.34. The state report appears to only cover state employees. The Texas municipal retirement system does not provide retiree health care and their fact sheet states this is done directly by localities.
UT				x	x		The state GASB report appears to only cover state employees and this was confirmed by Marcie Handy, the state of Utah Assistant State Comptroller, Department of Administrative Services, Division of Finance. Both ed. and non-ed. local retiree heatlh care is completely decentralized and handled by individual governments. The state valuation covers liabilities accrued before Jan. 1, 2006. On Jan. 1, the retiree health program was converted to a plan which places money into a Health Reimburesement Account (HRA) which can be used to purchase health insurance. This new benefit does not trigger liabilities under GASB 43 or 45. Instead it is accounted for under GASB 16. (In 2014, the HRA program will terminate.)
VT							

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VA	x					x		The Health Insurance Credit Program (HICP) supplements the pension benefit by providing $4 a month per year of service (no COLA; cannot exceed monthly health insurance premium). Although the program is avaliable to "participating" political subdivisions (i.e. local governments), the state GASB report only covers state employees and teachers. In addition to the HICP, the state offers health insurance to state retirees through the Health Insuance Benefit for State Retirees program. However, this only provides access to the insurance pool as the state pays none of the cost (http://www.dhrm.state.va.us/hbenefits/openenroll2012/NonMedicareRetireePremiums2012.pdf.)
WA	x	x						Reasonable clear that state report gets all state and local workers as there are categories for: state (including higher ed.), k-12 and political subdivisions
WV	x	x						State GASB report covers all state and local workers, including k-12.
WI					x	x		The state GASB report covers only state workers, including higher ed. This was confirmed by Bob Willett of the Department of Employee Trust Funds, State of Wisconsin. Mr. Willett also provided the information that, although localities can use the state health plan for their workers and retirees, the state does not fund this and all acturial accounting for local retiree health is done by each individual local government.
WY								