Demographics, Aging, and State Taxes

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Summary

The aging population will have important impacts on the finances of state and local governments. This report examines the potential implications for state tax revenue, with a focus on personal income and general sales taxes, the two largest state government tax revenue sources nationally.

The population is aging for two reasons: People are living longer, in large part reflecting improvements in health, and fertility rates have fallen dramatically since the Baby Boomer years and have stayed low. Demographic forecasters predict that life expectancy will continue to improve and that fertility rates will stay low. Thus, the population will continue to age. The Baby Boom is a big part of this but is not the only cause.

The elderly population will grow rapidly, and the growth rate of the working-age population will slow. The younger, school-aged population will grow slowly. A shorthand measure of the potential implications of aging, the old age dependent ratio (the ratio of the number of older people to the number of working-age people), has been rising substantially and will continue to do so.

These changes will have important effects on the economy. Slower workforce growth will mean slower tax revenue growth, all else equal. In addition, some economists believe that an older workforce will be a less productive workforce, further slowing growth in the income and production upon which state tax systems generally rely. However, the research on this is not definitive.

Faster growth in the elderly population will mean relatively less income and sales tax revenue for several reasons. Older age groups tend to have lower incomes in part because many no longer have wage income. The composition of their other income also changes, with much of it coming from retirement income sources such as Social Security, pensions, and IRA withdrawals. Many states choose to tax these income sources far more lightly than the federal government, treating otherwise equal people unequally even though academic research suggests that taxing this income would have little impact on interstate migration. Older age groups tend to spend less than immediately younger cohorts, although expenditures do not fall as sharply as income does. The kinds of expenditures the elderly have tend to be taxed somewhat more lightly under state sales taxes than other expenditures, although this does not generally reflect intentional policies to tax the elderly lightly, and it is not as large a benefit as is conferred through the income tax.

While this report does not try to quantify effects other than for income and sales taxes, local property taxes will be affected, too. Property taxes paid by older homeowners tend to be far lower than taxes paid by immediately younger age groups. This appears to reflect primarily policies and practices that tax the elderly less heavily than younger homeowners, although lower home values play a role, too.

The aging of the population will change the spending demands that state and local governments face, although this is not a focus of the report. Health care costs of the elderly are much greater than those of the non-elderly. Forecasters expect that these costs will continue to grow more rapidly than the economy. Thus, states are likely to face pressure in their largest health care program, Medicaid. They may also face increased pension costs, although in principle, actuarial calculations take anticipated aging and longevity improvements into account. Nonetheless, it is a risk above and beyond other pension risks that state and local governments face. There may be savings in other parts of state and local government budgets. The slowly growing school-age population may provide relief compared to historical rates of spending growth pressure, and there may be other potential savings as well.

We estimated the potential impact of an aging population on the personal income and general sales taxes of six case-study states that have diverse population age structures and outlooks, and diverse revenue structures. The method used here holds all else constant except changes in the size and age distribution of the population; it does not consider other changes that could occur, such as recessions or policy changes. We focus on the period from 2020 to 2040 — a period for which we could obtain high-quality, well-regarded population forecasts for all states. The forecasts suggest that the most-rapid population aging will occur between 2020 and 2030, after which the pace will slow. An appendix to this report provides sufficient details on how we constructed these estimates so that interested analysts in states could construct similar estimates and improve upon them using forecasts prepared by in-state experts.

Table 1 summarizes the results. The first two columns show our estimates of how per-capita income and sales taxes would change in the case-study states if their projected population age distributions for 2040 were in effect in 2020. In other words, this reflects the fact that an older population in 2020 would have relatively lower incomes and income taxes, and relatively lower expenditures and sales tax payments.

Table 1: Summary of potential income and sales tax changes, and combined impact

Summary of potential revenue impact, per capita

	Percentage change in per-capita tax due to moving from 2020 to 2040 age composition		Combined income and sales tax impact as % of own-source revenue
	Personal income tax	General sales tax	
California	-3.2%	-2.1%	-1.8%
New Hampshire	-2.2%	n/a	0.0%
New York	-2.9%	-1.7%	-1.4%
Ohio	-3.5%	-2.4%	-1.3%
Tennessee	n/a	-1.9%	-0.7%
Texas	n/a	-1.6%	-0.7%

Source: Author's analysis of multiple data sources. See text for details.

It is important to keep these numbers in perspective. While a projected decline in per-capita revenue is never good news for policymakers trying to balance budgets, these changes are projected to roll out over 20 years. In 2009, as a result of the Great Recession, California's income tax revenue declined by 20.4 percent and Ohio's declined by 15.5 percent *in a single year*.[1] Declines of 3 to 3.5 percent over 20 years seem small in comparison. A similar point could be made about the sales tax.

We are not suggesting that states should be sanguine about the implications of population aging. In some cases, they may face outright declines in tax revenue before considering inflation, as we estimate could occur in Ohio. This is not to be taken lightly. Furthermore, states could face daunting expenditure challenges, although we have not estimated their magnitudes in this report. States do have time to address these issues. Time can be a mixed blessing for state policymakers: sometimes the most difficult problems to solve are the ones that accrete slowly, as opposed to crises that occur all at once. States should stay on top of these issues, study them carefully, estimate their potential effects, and make plans to deal with them. Some states are already doing exactly this.

Introduction

The United States population is aging, as it is in much of the world. One indicator is a rise in the median age from 30 years in 1980, to 35.2 years in 2000, to 38.2 years in 2018.[2] The United Nations World Population Prospects project forecasts that it will rise to 41.6 years by 2040.[3]

What does an aging population mean for state and local government finances, and specifically for state government tax revenue? That is the subject of this report.

Major demographic changes that will affect state and local government taxes

Aging of the population[4]

The population in the United States and much of the world is aging. There are two main causes: individual-level aging due primarily to improved health outcomes, and declining birth rates. Other forces, such as migration, generally play a smaller role for the nation, but they may play a larger role in smaller geographic areas. Migrants are on average younger than the overall U.S. population, so migration reduces population aging.

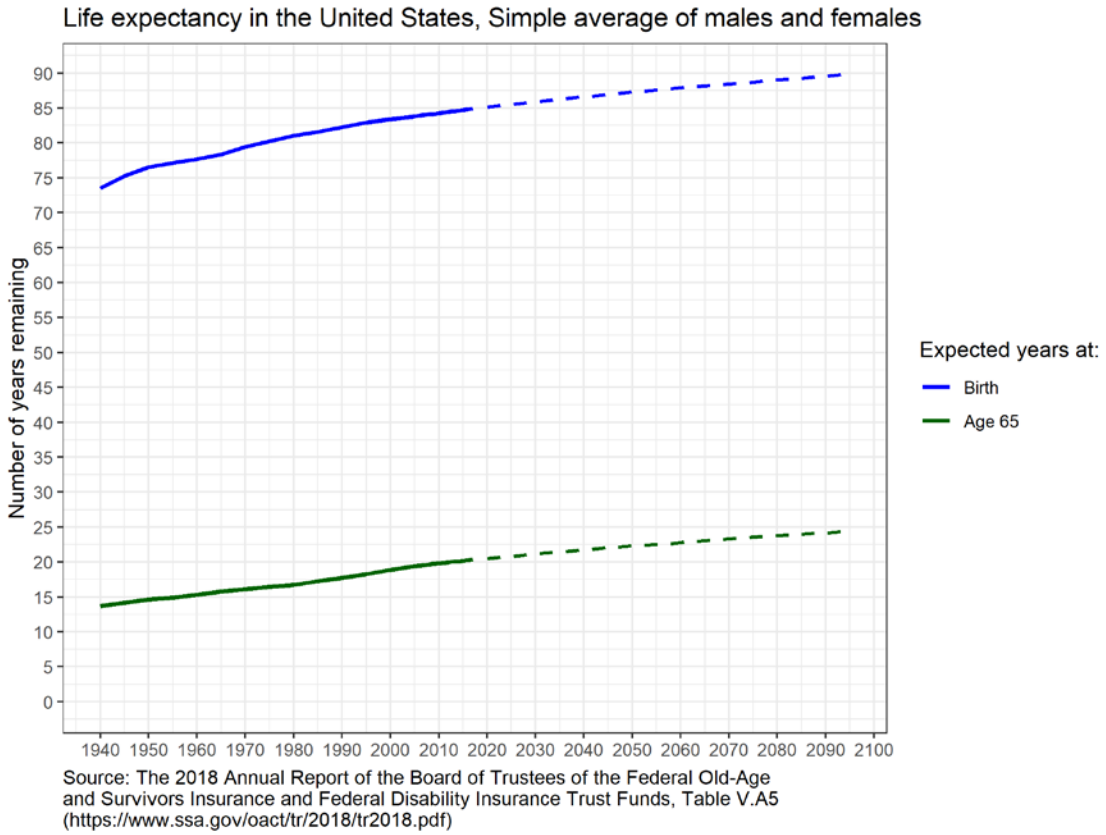
Individual-level aging and life-expectancy improvements

Individual-level aging reflects increases in the average length of life. In 1900, average life expectancy at birth was 47 years, but it is nearly 79 years today.[5] Forecasters project that it will exceed 80 years in 2040 and will continue to rise.[6] Improvements in the first half of the 20th century were driven by increased survival of children as infectious diseases were brought under control. Improvements since the 1950s have largely reflected declines in adult mortality, particularly improved management of cardiovascular disease. Life expectancy improvement in the United States has lagged improvement in most of the world, and life expectancy levels in the United States are below those of many other high-income countries. Researchers attribute much of this shortfall to a history of heavy smoking and high levels of obesity in the U.S.

Remaining life expectancy at older ages also has been rising. For example, in 1950 a 65-year-old woman in the United States had a remaining life expectancy of 15.1 years. By 2010 that had risen to 19.9 years, and it will rise to 24.1 in 2050 under projections prepared for a study by the National Research Council.[7] Men's life expectancy is lower than that of women but is projected to rise as well. A longer-living older population could lead to increased costs of programs that disproportionately benefit the elderly, such as Medicaid.

Figure 1 shows historical and projected life expectancy in the United States at birth and at age 65.[8]

Figure 1: Life expectancy has been increasing and is projected to rise further



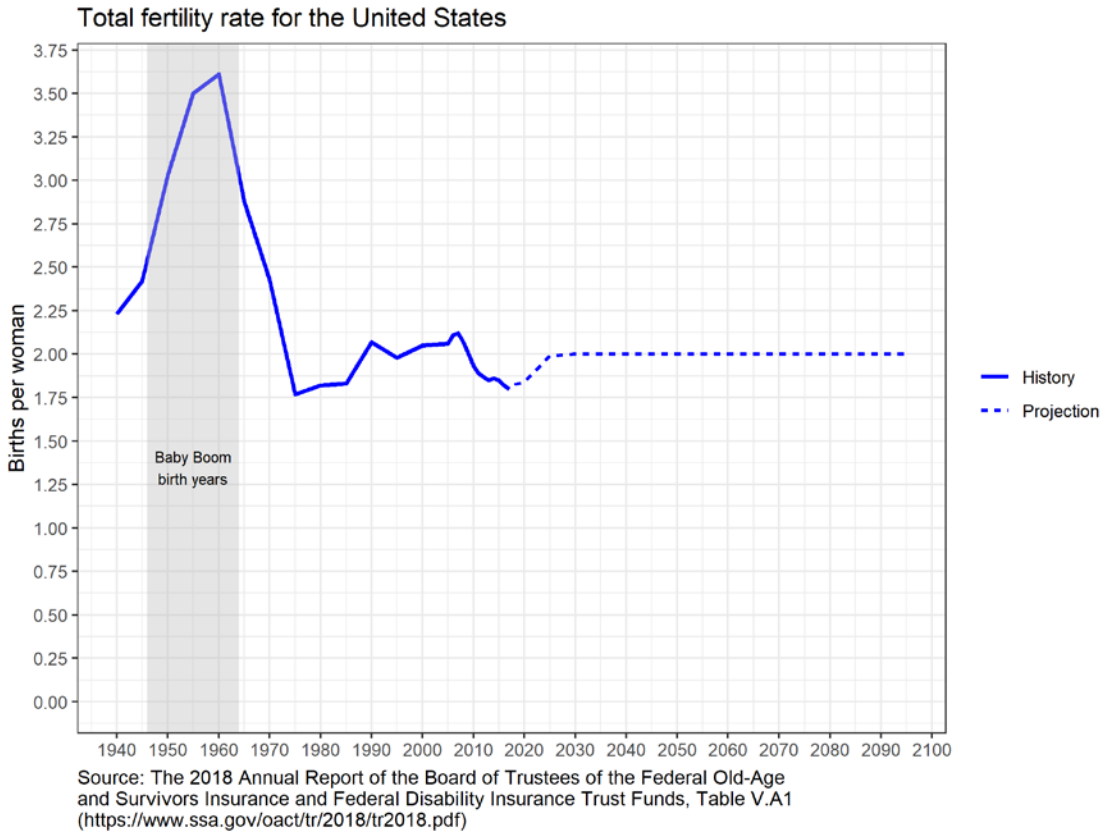
Life expectancy varies within the United States: It tends to be higher for people with greater educational attainment, higher for whites than for blacks, and often higher for Hispanics than for non-Hispanic whites. It also varies geographically: It is highest in Hawaii and in many of the Midwestern and Mountain states, and lowest in the Deep South.[9] The reasons for variation are complex but likely include differences in smoking, obesity, exercise, access to health care, stress, pollution, crime, and other factors.

Declining birth rates after the era of the Baby Boomers

Birth rates have varied significantly over time in the United States. They are commonly measured by the total fertility rate, which can be thought of, approximately, as the average birth rate per woman of childbearing age.[10] After the end of World War II, the total fertility rate rose sharply, resulting in the Baby Boom generation born during the years 1946 through 1964. The total fertility rate fell from a peak of 3.68 in 1957 to a postwar low of 1.74 in 1976. Since then it has fluctuated in a narrow range and is projected by the Social Security Administration to be approximately 2 for as far as its forecasts extend. This would require an increase from the recent low fertility rate, as Figure 2 shows.[11] Many demographers believed the declines in fertility rates after the Great Recession were cyclical and that fertility rates would recover, but the awaited increase still has not occurred.[12] If fertility rates do not recover as the Social Security Administration projects, economic growth could be lower than projected, although most of the impacts on the working-age population would not be felt in the 2020 to 2040

period that is the focus of this report. Declining birth rates mean that younger generations are smaller relative to older generations, raising the average age of the population.

Figure 2: Fertility rates rose dramatically during the baby boom era but have fallen and stayed Low

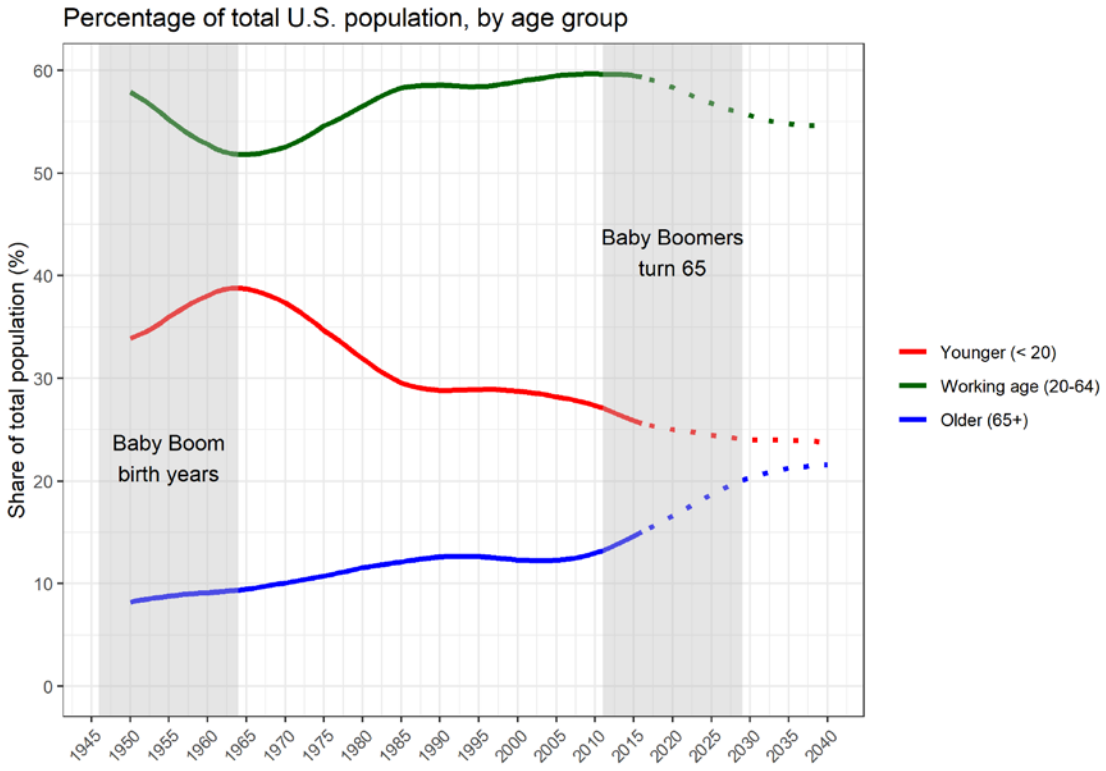


The combined impact of longer lives and lower birth rates: Population aging

The combination of longer lives and lower birth rates means the population is getting older, particularly as the large Baby Boomer cohort continues to age. However, it is more than a Baby Boomer phenomenon—with further improvements in life expectancy and low fertility rates the population will continue to age.

Figure 3 shows the percentage share of the population divided into three groups, defined here as younger (less than age 20), working age (ages 20 to 64), and older (age 65-plus).[13] [14] The Baby Boomers began to turn 65 in 2011, and the share of the population that is age 65-plus has been rising since, and will continue to rise, until it starts to level off in the late 2030s.

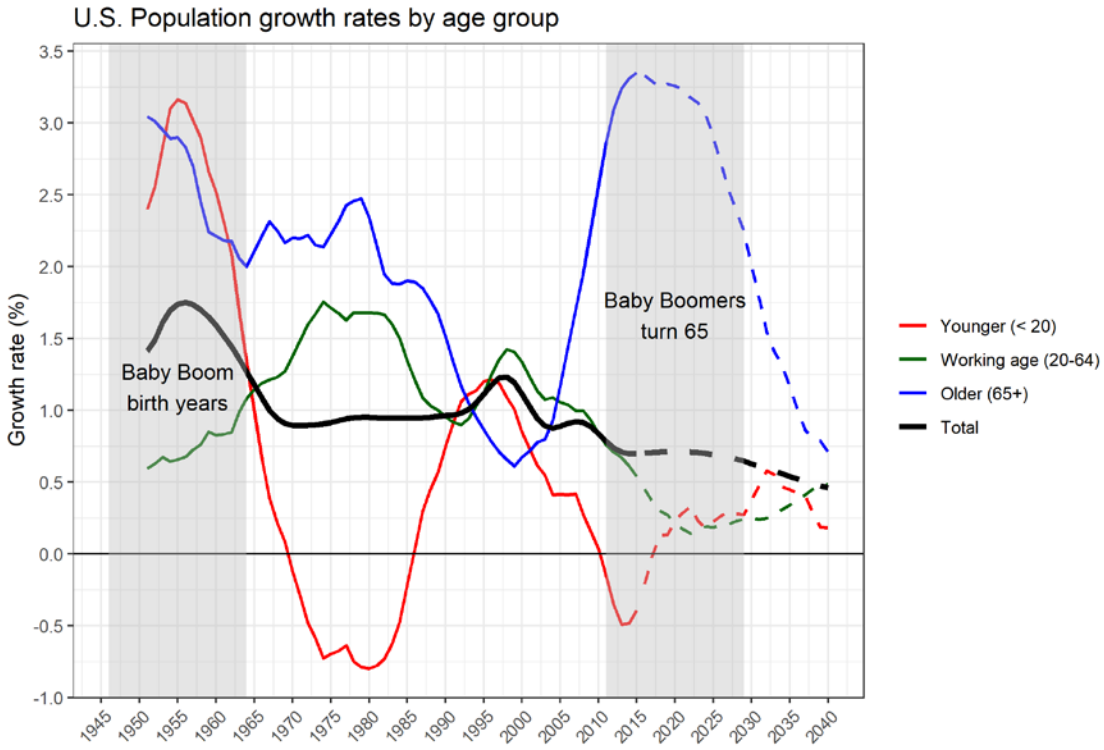
Figure 3: The age 65+ cohort has been increasing rapidly as a share of the nation's population



Source: Data underlying 2017 Revision of World Population Prospects, The United Nations, https://population.un.org/wpp/, (https://population.un.org/wpp/DVD/Files/1_Indicators%20(Standard)/CSV_FILES/WPP2017_PopulationBySingleAgeSex.csv)
First projection year is 2016, at which point lines are dotted.

The next figure provides a different perspective on the data underlying Figure 3, showing historical and projected annual growth rates for each cohort.

Figure 4: Population growth has slowed and will continue to slow



Source: Data underlying 2017 Revision of World Population Prospects, The United Nations, https://population.un.org/wpp/, (https://population.un.org/wpp/DVD/Files/1_Indicators%20(Standard)/CSV_FILES/WPP2017_PopulationBySingleAgeSex.csv)
Notes: Growth rate is 3-year centered moving average to avoid focus on spurious movements.
Projections begin in 2016, marked by dashed lines.

This graph offers several insights into how population aging could affect the finances of state and local governments.

First, and most well-known, the blue line depicting the growth rate of the older population rose sharply in the mid-2000s and will stay high throughout the projection period. This rapid growth will affect demand for services governments provide that disproportionately affect the older population or are disproportionately expensive for the older population, such as health care through the Medicaid program. It also will affect tax revenue because older people generally have lower incomes and a different composition of income than younger people and have different consumption patterns.

Second, the growth rate of the working-age population has declined significantly from the late 1990s and will remain relatively low during the projection period. This likely will lead to slower employment growth and income growth, discussed below.

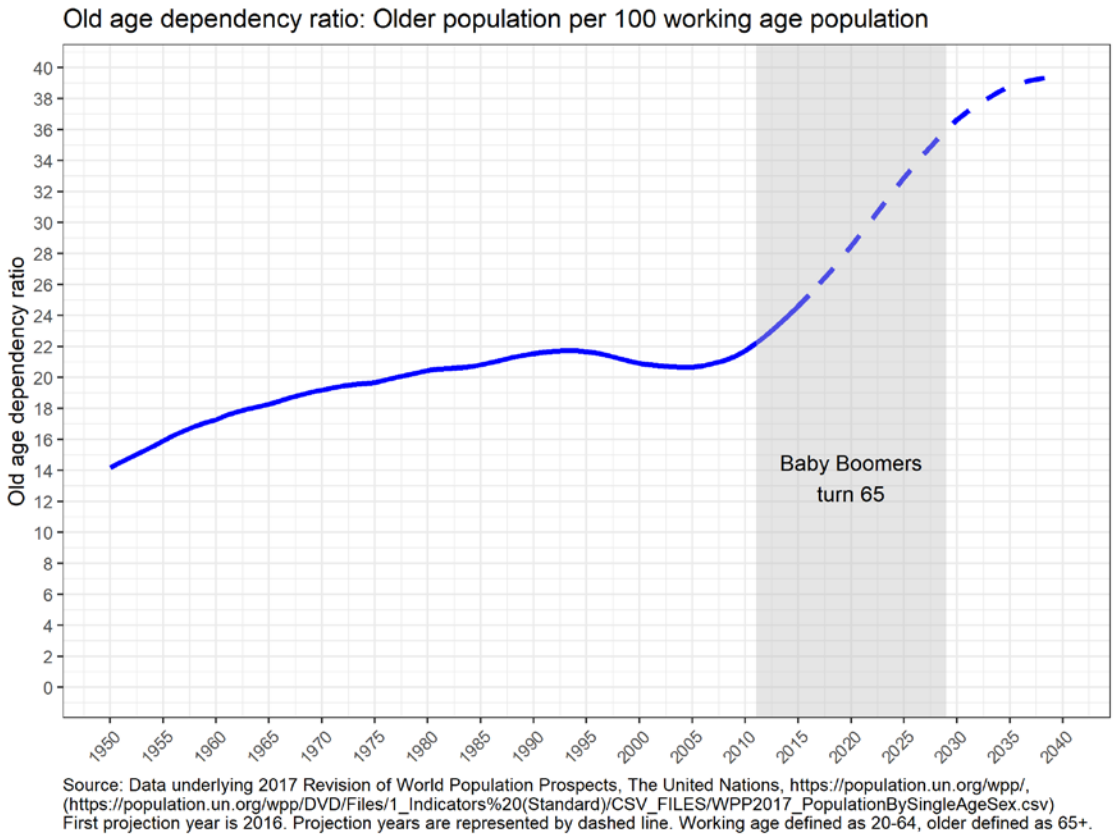
Third, the growth rate of the younger, mostly school-age population fell sharply after the mid-1990s, and growth has been negative in recent years (i.e., the school-age population has been declining). Growth soon will resume but will remain relatively low. This could mitigate pressures

on governments for services that disproportionately affect younger populations such as K-12 education.

Old-age dependency ratio

Finally, a summary measure often used to show how the age of the population is changing, and to suggest potential implications, is the old-age dependency ratio — the ratio of the older population to the working-age population. If the older population is truly dependent, as this term suggests, then a rising ratio suggests that government finances may become strained as the depending population increases relative to the working-age population earning income and paying taxes. Figure 5 shows the sharp rise in this ratio predicted over the next two decades.

Figure 5: The ratio of the older population to the working-age population will rise substantially



Economic effects[15]

Growth in per-capita income depends upon the share of the population that is employed, and average productivity per person employed.[16] Population aging will lead to slowing growth in the working-age population and to declines in the working-age population as a share of the total population. All else equal, it will lead to slowing economic growth. All else may not be equal, as people could choose to work more during normal retirement years, in part reflecting improvements in rates of disability among elders, which had been declining until recently.[17]

Population aging may also lead to changes in the fraction of the working-age population that is employed, and to changes in the productivity of those working, but researchers are less certain about the magnitudes of these effects.

From 1960 through 2010 labor force participation grew rapidly, reflecting a sharp increase in women's participation. Most forecasters project that labor force participation will decline modestly as the population ages, reflecting, among other things, the movement of Baby Boomers into cohorts that tend to have lower participation rates and a declining share of young and prime-age workers.[18] [19] These movements could be offset partly by more working by the older population, reflecting deferred retirements because of improved health relative to prior cohorts and necessity.

Another question is how the aging population will affect labor force productivity. Some researchers have argued that productivity growth will slow as the population ages, further dampening economic growth, in part because older workers may be less productive than younger workers. Research is mixed on this topic.[20]

The National Science Council Committee on the Long-Run Macroeconomic Effects of the Aging U.S. Population estimated that these effects would slow the growth in income per capita by 0.55 percentage points per year over the two decades from 2010 through 2030.

There will be other economic effects from population aging, including possible effects on human capital, asset values, rates of return and other aspects of the economy. However, the effects discussed above — namely, changes in the labor force participation rate — appear to be the most important from the perspective of state government tax revenue.[21]

We will look later at the changing composition of income and consumption in an aging population, which are tied to changes in labor force participation.

Projections of population aging for individual states

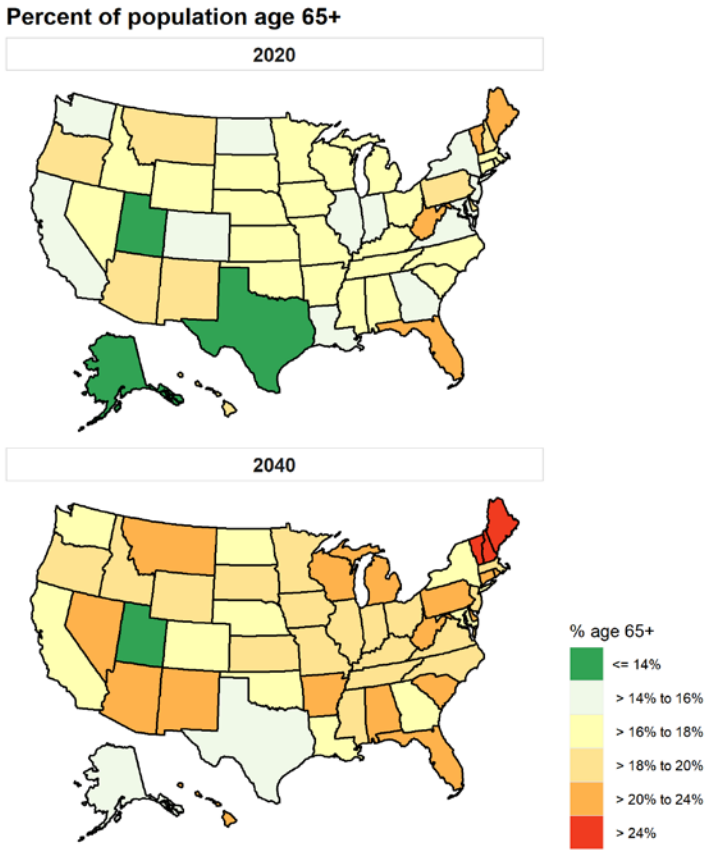
In this report, we focus on the impacts of aging between 2020 and 2040. The most rapid aging is projected to occur between 2020 and 2030, with aging proceeding at a slower pace between 2030 and 2040. We use state-level projections by age group prepared by the Weldon Cooper Center for Public Service at the University of Virginia in December 2018.[22] In our experience, these projections compare well with projections prepared by individual states, and they have the advantage of being available for all states, in a consistent format, based upon a methodology that is consistent across states.[23] Analysts in individual states studying the impacts of population aging on their state may prefer to use projections prepared by in-state organizations, if available, as forecasters may be able to take advantage of state-specific data and insights on state-specific policies and social factors not easily available to the Weldon Cooper Center.

States vary greatly in the age composition of their populations and in the rates at which they are aging. In 2020, the median age in the United States will be 37.9 years, according to the

Weldon Cooper Center projections.[24] However, the median age will range from 30.6 in Utah, the youngest state in the nation, to 45.5 years in Maine, the oldest state. The median age is expected to increase in every state over the next two decades, with most of that aging occurring between 2020 and 2030. For the nation the Weldon Cooper Center projects that the median age will increase from 37.9 years to 38.5 years in 2030, and edge slightly upward between 2030 and 2040, to 38.6 years. Vermont is projected to have the greatest change between 2020 and 2040, with the median age increasing by 2.2 years, from 44.1 to 46.3 years. North Carolina is projected to have the smallest increase, from 38.2 years to 38.3 years.

The median age is a summary indicator of the overall age of a state's population. Because we are particularly interested in the effects of the older population, it is also useful to look at the percentage of the population that is age 65 or older, shown in Figure 6. Maine is the oldest state by this measure as well as by median age, with 21.4 percent of its population — more than 1 in 5 people — expected to be age 65 or older in 2020, compared with 16.2 percent for the nation. Florida, Vermont, and West Virginia also are projected to have at least 1 in 5 people age 65 or older. By 2030, 24 states are projected to have more than one-fifth of their population age 65 or older; that number will actually drop slightly between 2030 and 2040, to 19 states.[25]

Figure 6: All states are aging, but they vary in their current age composition and in how rapidly they will age



Source: Author's analysis of projections from Weldon Cooper Center for Public Service, University of Virginia, updated December 2018, https://demographics.coopercenter.org/

How population aging could affect state tax revenue

Population aging will affect all levels of government. This report focuses on direct impacts on state tax revenue, but population aging will have other effects as well. It will create growing pressures for federal spending on Social Security, Medicaid, and Medicare, among other programs, and will affect federal income tax revenue. Population aging will affect local governments through new spending pressures on programs for the elderly, through property tax exemptions and other preferences for the elderly, and possibly though changes in transfers from state and federal governments.

To examine the impacts on state tax revenue, we focus on the largest sources of tax. The two largest revenue sources for most state governments are the personal income tax and the general sales tax. The income tax accounted for 37 percent of state government tax revenue in 2016, and the sales tax accounted for 32 percent. This report is focused on state governments, but the financial condition of local governments can affect states, also; the property tax is the mainstay of local government finance, accounting for 72 percent of tax revenue in 2016.[26]

Income tax

Four main issues will influence how the personal income tax will respond to population aging.

First, income tends to follow a hump-shaped pattern for individuals over their lifetimes, and for the population across age cohorts. It is lowest at younger ages but rises as people gain experience and expertise, and then tends to fall after about age 50, on average, reflecting retirement choices and other factors.[27]

Second, the composition of income changes. There do not appear to be recent national data on how the components of taxable income change across age cohorts or within individuals over time, but several older studies and state-specific studies point to a rise in pensions, Social Security and taxable withdrawals from individual retirement accounts (IRAs) as people grow older.[28] One implication is that these income sources, which generally are included in the federal income tax, will grow rapidly over the next two decades as a larger share of the population moves into retirement.

Retirement income included in federal adjusted gross income, defined as taxable pensions, the federally taxable portion of Social Security, and IRA distributions, grew 50 percent between 2009 (the end of the Great Recession) and 2016. IRA distributions grew 91 percent, Social Security grew 66 percent, and taxable pensions grew 35 percent.[29] By contrast, income from wages and salaries grew only 26 percent and consumer prices rose 12 percent[30] (Table 2).

Table 2: Between 2009 and 2016, retirement income grew 50 percent while salaries and wages grew only 26 percent

Retirement Income in Federal Adjusted Gross Income

Billions of dollars

				Change from 2009 to 2016	
	2009	**2016**	**% share of AGI in 2016**	**Dollar change**	**Percent change**
Adjusted gross income	$ 7,801.0	$ 10,200.1	100.0%	$2,399.1	30.8%
Salaries and wages	5,710.9	7,187.7	70.5%	1,476.8	25.9%
Net capital gains less loss	224.1	618.9	6.1%	394.9	176.2%
Taxable pensions	516.5	695.1	6.8%	178.6	34.6%
Taxable Social Security	171.3	285.0	2.8%	113.7	66.4%
Taxable IRA distributions	133.9	255.0	2.5%	121.2	90.5%
Retirement income	821.7	1,235.2	12.1%	413.5	50.3%
All other non-retirement income	1,044.4	1,158.3	11.4%	113.8	10.9%

Source: IRS Statistics of Income, Historical Table 2

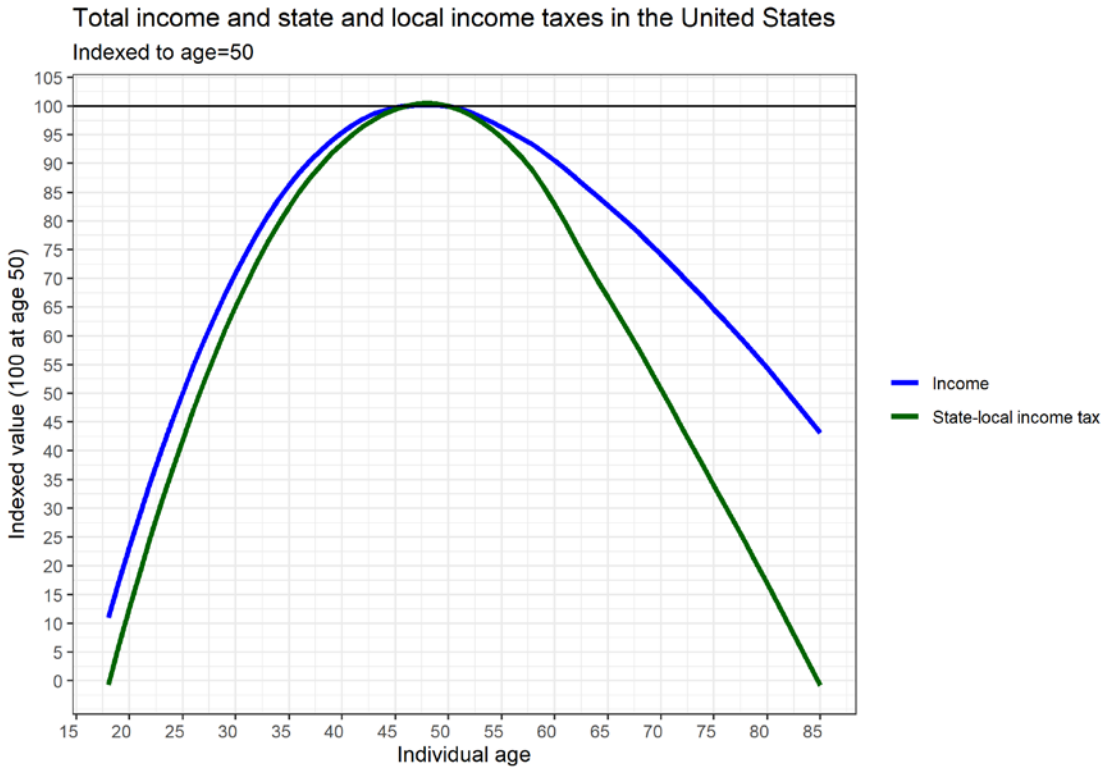
Other changes, not directly related to aging, will influence the composition of income. Defined benefit pension plans have been sharply curtailed in the private sector in favor of defined contribution (DC) plans. As a result, we would not expect taxable pensions to grow as quickly as taxable withdrawals from employer-sponsored defined contribution plans and from IRAs.[31] However, employer-sponsored DC plans are included in the taxable pensions line in Table 2, so it may be difficult to disentangle this relationship based on available data. While the composition of retirement income sources may change over time, rapid growth in these income sources is likely to continue, and they will constitute an increasing share of taxable federal income.[32]

Third, although much of this retirement income is included in the federal income tax base, many states exempt some or all this income or provide other tax breaks for the elderly. The federal government taxes up to 85 percent of Social Security income, but as of 2014, 28 of the 41 states with a broad-based income tax did not tax it at all.[33] States frequently exempt some or all pension income from tax. Four states wholly exclude private pensions from tax and another 23 partially exclude this income. Eight states wholly exclude state and local government pensions from tax, and 26 partially exclude this income. Eleven states wholly exclude federal civilian pensions from tax, and 23 partly exclude them.[34] States have additional ways in which they reduce taxes on older taxpayers, including extra exemptions, deductions, or credits based on age.[35] Illinois, despite its deep fiscal troubles and difficulty paying for pensions promised to state and local government workers, exempts virtually all retirement income from tax.[36]

As a result of these policies and other factors, income tax payments to state and local governments by older individuals fall far more sharply than income falls as age increases, as

data from the Current Population Survey show (Figure 7). The horizontal axis shows the age of individuals and the vertical axis shows their income and state-local income tax payments relative to these amounts at age 50. For example, at age 60 the blue line (income) has a value of approximately 90, indicating that the average person age 60 has about 90 percent as much income as the average person age 50. The green line (state and local income taxes) has a value of approximately 82.5 at age 60, indicating that the average person age 60 pays about 82.5 percent as much state and local income tax as the average person age 50.

Figure 6: Average income and state-local income taxes are lower after about age 50, with income taxes falling more than income



One study found that in 1999, the average state effective tax rate on the elderly was significantly lower than it was on the non-elderly.[37] A study in Iowa found that effective tax rates in 2003 peaked at 3.1 percent of total income for taxpayers in the 45-54-year age group, falling to 2.7 percent for those in the 55-64 range, and to 1.2 percent for those in the 65-74 age range.[38] State tax treatment of the elderly generally has become more generous since either study.

Fourth, while the factors above focus on the elderly and how their incomes and taxes will change, the slowing growth or even decline in the working-age population will affect state tax revenue, too, because employment and income growth will slow. Forecasters in many states are aware of the slowdown and concerned about it. For example, a recent report in Oregon noted, “Given demographic trends today, particularly the aging Baby Boomer cohort, job

growth of 3 percent is considered full throttle. In decades past, growth of 4 or 5 percent was common during expansions in Oregon, however that time period also coincided with the Baby Boomers entering their prime working years. Today the opposite is occurring. Even so, demographic trends are not all bad, as the even larger cohort of Millennials are currently entering their prime working years. The net effect is overall lower rates of labor force and economic growth, due to demographics."[39]

Sales tax

Similar issues arise with state sales taxes, but not to the same degree as with the income tax.

First, as discussed in relation to the income tax above, income tends to be lower for elderly households than it is for those in their prime working years or near retirement. Partly as a consequence, consumption expenditures by the elderly on goods and services fall also, but not by as much as income falls. This could simply be a generational difference, with older age groups now spending less than their younger counterparts, or it could reflect efforts by people to smooth their consumption over their lifetimes, avoiding sharp changes in standard of living. The evidence on this is mixed, with some studies suggesting that households do smooth consumption over their life cycles and others suggesting not, or that smoothing is limited to certain kinds of consumption.[40] A recent study that followed people over time, rather than comparing across cohorts, noted that total household spending dropped 5.5 percent in the first two years of retirement and 12.5 percent by the third or fourth year, after which the decline slowed down.[41] [42]

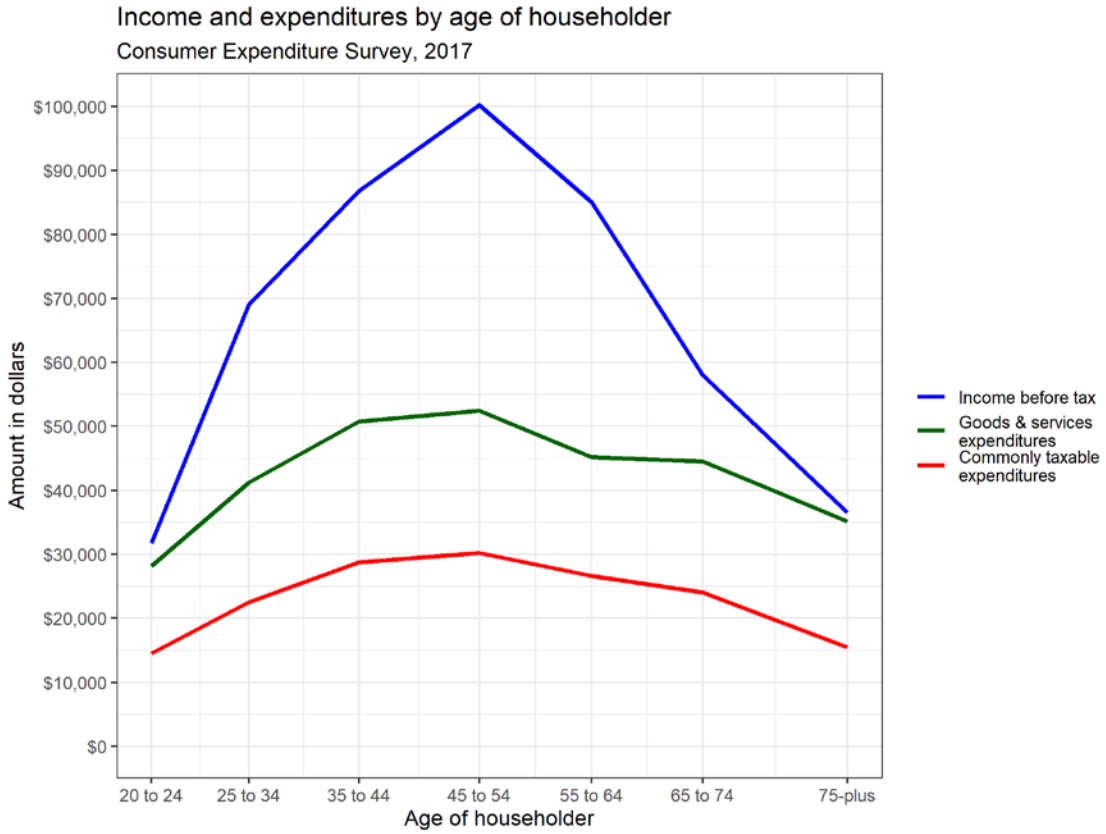
Second, the composition of consumption shifts among older households. A recent Census Bureau analysis of Consumer Expenditure Survey (CEX) data compared spending across cohorts at a single point in time and noted declines among older households in spending on clothing and transportation as a share of total expenditures, both of which may be related to declines in commuting and increases in spending on health care.[43]

Third, state sales tax policies vary in ways that may affect the elderly differently from others, but policies that explicitly target the elderly for benefits are less common in the sales tax than they are in the income tax. One interesting exception is South Carolina, which provides a one percentage point exclusion from the state sales tax for purchases of tangible personal property by people 85 years of age or older, effectively lowering the rate from 6 percent to 5 percent. To qualify for the exclusion, an eligible person must ask for the benefit at the time of sale. Oklahoma provides a "sales tax relief credit" against its income tax, sometimes called a "grocery tax credit," of up to $40 for elderly, low-income, and disabled taxpayers.[44] However, this does not vary with sales-taxable consumption, and really is an income tax preference in the guise of sales tax relief.

Most state sales tax policies that affect the elderly are less direct. However, states generally exempt many health care and housing expenditures from their sales taxes, and most exempt food consumed at home, all of which are substantial expenditures of the elderly.

Unlike with state income taxes, we do not have data on sales taxes paid by households in different age groups, but we can construct estimates of taxable sales by age group in a manner similar to the method used in an influential paper on the impact of population aging on state tax revenue, drawing on data from the Consumer Expenditure Survey.[45] Figure 8 shows the result of these calculations. It has three lines, all drawn from the CEX: total income before tax, expenditures on goods and services (excluding items such as mortgage payments, insurance purchases, and cash contributions), and expenditures on goods and services commonly subject to state sales taxes.[46] Income falls off sharply for households where the head is older than 54, but expenditures on goods and services and on commonly taxable goods and services fall by much less.

Figure 7: Consumer spending and sales-taxable spending fall among older people, but not as sharply as income falls



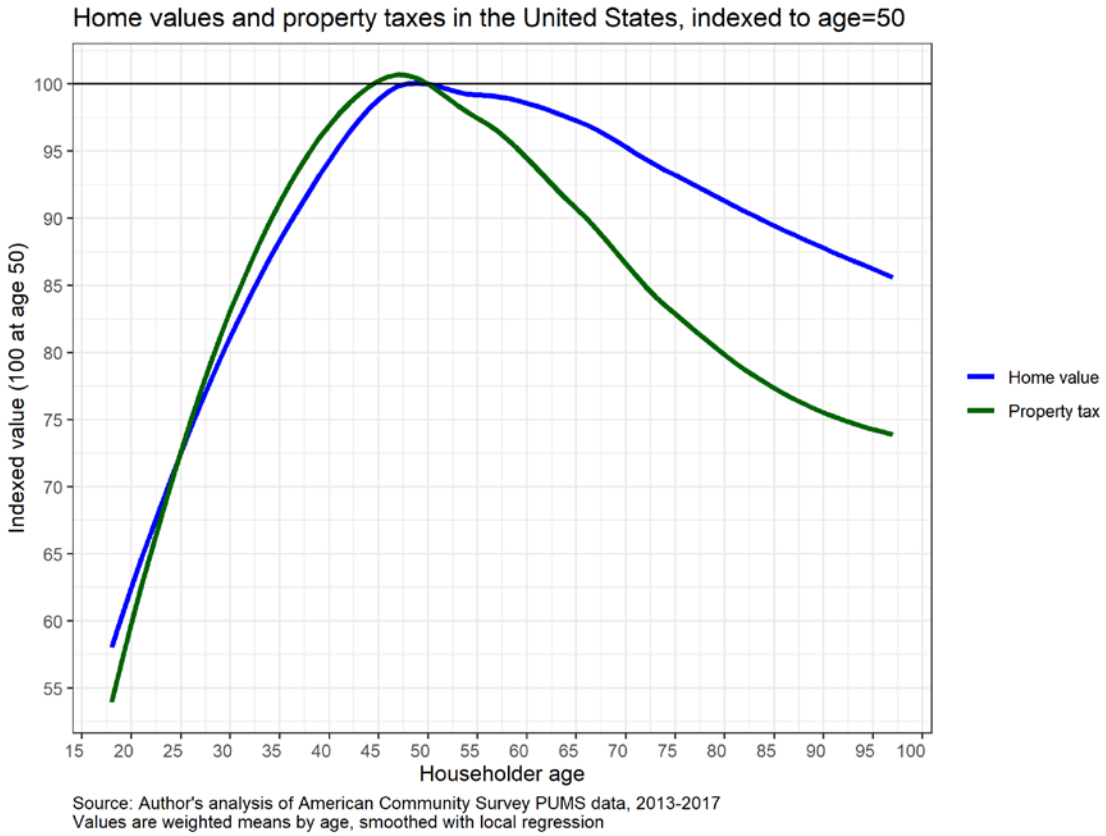
Other taxes

An aging population will affect other state taxes, but in ways that are not as obvious as they are for income and general sales taxes. Furthermore, the changes are likely to have a smaller impact on overall state budgets because the taxes themselves are smaller. For example, Alison Felix and Kate Watkins concluded in their study: "Corporate income taxes and severance taxes are not likely to be directly affected by an aging population and instead are much more closely related to the business cycle. State collections from estate and gift taxes are likely to increase as the population ages, but these collections are typically assessed only on high-wealth individuals and make up less than 1 percent of state tax collections."[47]

Local property taxes will be affected by population aging, and this could have spillover effects on states, although states generally will not feel direct effects. States do not generally rely on the property tax. For the United States as a whole, it accounted for only 1.3 percent of own-source revenue for state governments in 2016, and 1.8 percent of tax revenue. For one state, New Hampshire, it amounted to 9.3 percent of tax revenue.

The impacts on property tax revenue probably will be negative under current policies. Home values tend to fall as age increases, after about age 50 reflecting, among other things, a tendency for older individuals to downsize, and property taxes fall even further (Figure 9), based on data from the Current Population Survey. One reason property taxes fall further than home values is that most states mandate homestead exemptions or credits for senior citizens.[48]

Figure 8: Average home values and property taxes are lower after about age 50, with property taxes falling more than home values



Several states also have complex rules governing when properties can be reassessed, sometimes requiring a sale or transfer before property can be reassessed. These provisions can provide substantial benefits to older homeowners and alter the incentives to sell property.

On balance, under current laws, the impact of population aging on property tax revenue is likely to be negative.

Expenditure pressures and possible spending relief

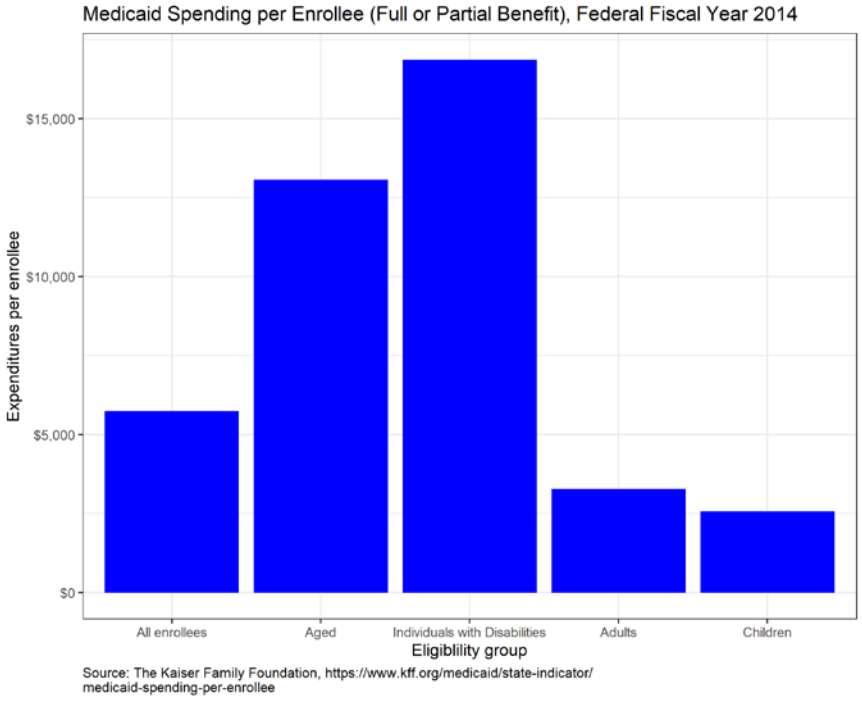
This report is focused on the impact of an aging population on state government tax revenue rather than on overall finances of state and local governments. The consequences for tax revenue generally appear to be negative, as discussed further below.

However, population aging will affect expenditure pressures as well. We have not studied these issues in detail, although we have examined national projections and selected studies in individual states. The two largest spending categories for state governments are Medicaid and K-12 education, and the likely impacts work in opposite directions because of slowing growth for the school-age population.[49]

Medicaid expenditures generally have grown faster than the economy, driven by growth in enrollment and economywide health care costs, although cost growth has slowed recently.[50] The Centers for Medicare & Medicaid Services projects that Medicaid spending will continue to grow faster than the economy, averaging 5.8 percent compound average annual growth from 2018 through 2027.[51] One factor behind this growth is the aging of the population, because expenditures for the aged are far greater, per enrollee, than they are for adults and children (Figure 10). Thus, all else equal, states that are aging rapidly are likely to feel considerable pressure for Medicaid spending.

Many individual state reports point out the risks from increased Medicaid costs for the elderly, and increased costs in other program areas that often disproportionately assist the elderly, such as social services, although these other costs tend to be far smaller than Medicaid.

Figure 9: Medicaid spending per enrollee is far higher for the aged than for adults and children



Less talked about but also important are potential savings in K-12 education. As Figure 4 showed, the school-age population in the nation has been shrinking and is not likely to grow rapidly in the next decade. While this will vary around the nation, it is likely to provide some relief in many states.

Finally, pension contributions could create risks for states. In principle, pension contributions consider the aging of the workforce and increasing longevity, and states should put aside funds on this basis, but these are uncertain assumptions. To the extent that actuaries do not anticipate these forces accurately, state governments could face risk of higher contributions. Apart from demographic impacts, if investment returns fall short, that could place upward pressure on contributions as well, but that is a separate matter.

Voting behavior and the gray peril

Retirees don't have direct self-interest in some services — for example, they generally will not have children in school and so they may not benefit directly from education spending and the school taxes that support it and may be more likely to support services that benefit the elderly directly.[52] School budgets often are decided by direct voting, and the elderly are more likely to vote than younger age groups, so one possible concern is that senior citizens, who often have fixed and lower incomes, will vote their direct self-interest and reduce support for school budgets. Of course, older voters may receive many indirect benefits from school budgets — they may have relatives and friends with children in school, they may benefit from higher property values if schools are well regarded, and they may satisfy a sense of duty by supporting younger generations. Nonetheless, the concern appears real, and is sometimes dubbed the "gray peril."

Research on this topic based on statistical comparisons of older versus younger communities, statistical analyses of voter referenda, and opinion surveys generally suggests that while this does occur it is not necessarily a large peril and is influenced by specific circumstances and may be offset by other policies.

One econometric analysis concluded that it matters whether the growing older population in a community comprises long-standing residents, who tend to be a source of support for educational expenditures, or newcomers to the community, who tend to lower spending.[53] An econometric analysis of a telephone survey of registered voters in connection to an actual budget referendum concluded that, for the school district in question, elderly voters were a diverse group and unlikely to vote in lockstep; they were only slightly less likely to support a referendum than non-elderly voters in the district.[54] Another study concluded that "an aging population structure substantially decreases school revenues, unless elderly homeowners receive state-financed reductions in their local tax-prices."[55]

Quantifying impacts

In the sections that follow, we quantify potential impacts of an aging population on income and sales taxes, using methods and data sources that could be applied in any state. Our work is based upon the approach taken in a paper by Felix and Watkins published by the Federal Reserve Bank of Kansas City, with updated data and with a few relatively small enhancements.[56] The method used here holds all else constant except changes in the size and age distribution of the population; it does not consider other changes that could occur, such as recessions or policy changes. The approach is valuable for identifying the nature of the impacts on individual states and their approximate magnitudes, and for understanding which states may be most affected and which least affected. We do not assert that it will result in precise estimates, or that the estimates take all important factors into account. In most cases, analysts in individual states working with population forecasts available from in-state forecasters and with other data tailored to their questions at hand are likely to improve upon what we do here.

The overall approach is to estimate how much a state's income tax revenue would change, and how much its taxable sales would change, both per person and in percentage terms if the age-composition of the population projected for 2040 were in place rather than the composition in 2020.

This approach isolates the impact of the changing age composition, but it does not put estimates in a budgeting context, in which forecasters anticipate growth in tax revenue, and may be concerned about the extent to which that growth will slow or accelerate as a result of population aging. This growth perspective may be especially important to analysts in states in which the working-age population is expected to decline or its growth is expected to slow dramatically, potentially retarding revenue growth substantially.

The appendix describes detailed steps in the analysis.

Case-study states

We selected six states as case studies for how population aging might affect their tax revenues: California, New Hampshire, New York, Ohio, Tennessee, and Texas. We used several criteria to identify these states, including:

- Diversity in current state revenue sources
- Diversity in taxes relative to the state economy
- Diversity of state population size
- Diversity of age composition of the population and how it is expected to change

We have limited capacity to identify detailed revenue linkages to changes in demographic composition, so the case study estimates should be seen as approximations to how states will be affected. Before we describe the results of this analysis, which we carry out in the manner describe above in *Quantifying impacts*, we summarize key characteristics of the case-study states.

Comparisons of selected case-study state characteristics

Demographic comparisons

Figure 11 shows a scatterplot of all 50 states, with the percentage of the population that is expected to be age 65 or older in 2020, and the change from 2020 to 2040 in this percentage. The plot is divided into four quadrants depending upon whether a state is above or below the United States average on these measures. The upper right quadrant includes states that are older than the United States average now and will become older more quickly than the United States average, labeled as older and aging more quickly. The lower left quadrant shows states that are younger than the United States average now and will become older more slowly.

Two of our case-study states, Ohio and New Hampshire, are older and aging more quickly, and New Hampshire has the distinction of aging most rapidly of any of the 50 states. Two of its New England neighbors, Maine and Vermont, also are much older than average and aging much more quickly. Ohio is neither as old nor aging as quickly as New Hampshire, but it faces special issues, as we shall see, because of its projected decline in the working-age population.

Three of our states are younger than average and aging more slowly: California, New York, and Texas. The final state, Tennessee, is not much different from the national average nor from Ohio.

Figure 10: Case-study states reflect a range of demographic situations

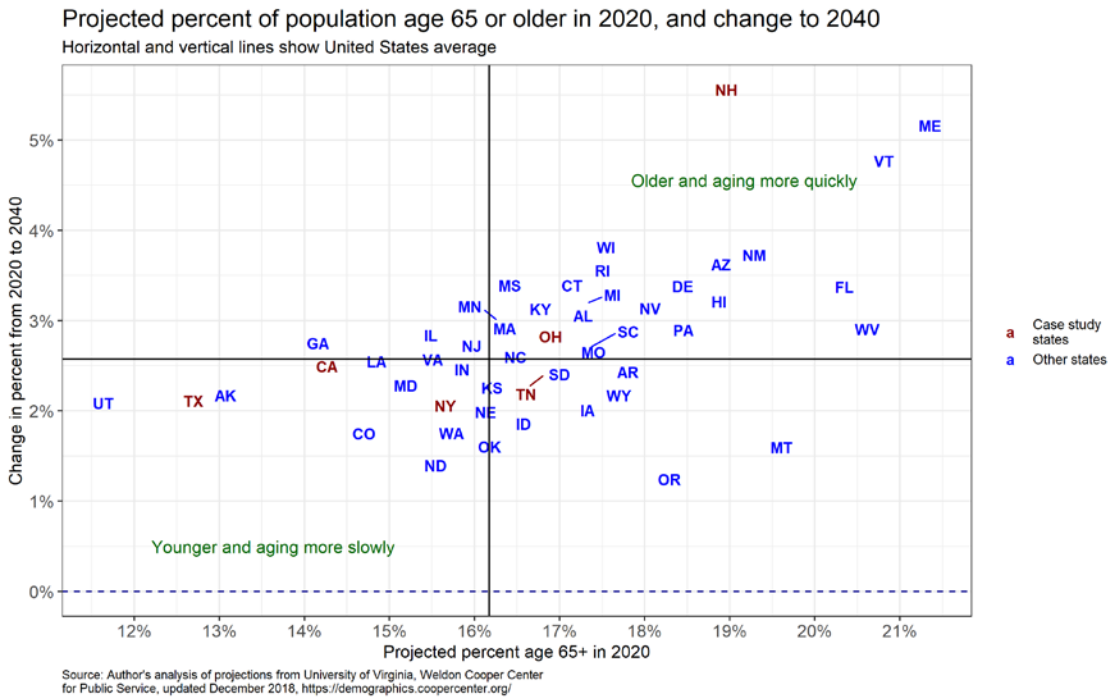


Table 3 shows the projected growth rates for each of our three major age groups and shows the growth rate of the older group minus the growth rate of the working-age group. New Hampshire and Ohio are both notable because their working-age populations are expected to

decline over the next 20 years, suggesting a risk that overall tax collections could decline, when considering inflation. New Hampshire is especially notable because its older population will grow so much faster than the working-age population in comparison to the other states. Texas, in contrast to the other states, is expected to have rapid growth in all three age groups, although the older group will grow much more quickly than the others.

Table 3: Projected population growth rates from 2020 to 2040 vary widely across case-study states

Projected population growth rates by age group, 2020 to 2040

	Younger (< 20)	Working age (20-64)	Older (65+)	Older minus working age
United States	13.3	9.4	32.3	22.9
California	15.8	9.6	35.3	25.7
New Hampshire	1.7	(6.2)	33.2	39.4
New York	5.1	0.2	18.0	17.7
Ohio	(0.5)	(4.1)	16.6	20.7
Tennessee	12.5	10.0	30.2	20.2
Texas	33.3	31.2	57.7	26.5

Source: Author's analysis of projections from University of Virginia, Weldon Cooper Center for Public Service, Updated December 2018, https://demographics.coopercenter.org/

A consequence of these differing growth rates across age groups and case-study states is that the old-age dependency ratio, defined as the ratio of the older population to the working-age population, rises in all our case-study states, particularly New Hampshire (Table 4). In general, the largest increases have either mostly occurred or will occur in the decade from 2020 to 2030. The further increases from 2030 to 2040 tend to be small. This suggests that the biggest impacts of the aging population could be upon us now, at least if aging is measured by the age 65+ population, which includes the relatively-young older population, many of whom may continue to work. However, some challenges that states face may be concentrated among the older part of the aged population rather than just the age 65+ population. For example, age-related increases in health care costs may be more significant in the period from 2030 to 2040, when the age 85+ older population will still be growing rapidly.

Table 4: Old-age dependency ratios are projected to rise sharply from 2020 to 2030 and then stabilize

Old age dependency ratio

	2010	2020	2030	2040	Change from 2020 to 2040
United States	21.7	27.9	34.1	33.7	5.8
California	18.8	24.1	29.6	29.7	5.7
New Hampshire	21.9	32.2	45.5	45.8	13.6
New York	22.1	26.0	31.2	30.6	4.6
Ohio	23.7	29.9	36.9	36.3	6.4
Tennessee	22.4	29.0	34.5	34.4	5.3
Texas	17.4	22.0	26.3	26.5	4.5

Source: Author's analysis of projections from University of Virginia, Weldon Cooper Center for Public Service, Updated December 2018, https://demographics.coopercenter.org/

Tax-related comparisons

Table 5 shows the percentage distribution of own-source tax revenue for the states. Again, we see great diversity. California and New York rely heavily on income taxes. Tennessee and Texas rely heavily on the general sales tax and have no income tax in the case of Texas, and a small tax on interest and dividends in Tennessee, known as the Hall tax, that is being phased out. New Hampshire has no general sales tax and no broad-based income tax, although it does tax interest and dividends. It relies far more heavily on the property tax than does any other state, and it relies heavily on other tax revenue sources including several special excise taxes and several business taxes.

Table 5: 3 Case-study states vary greatly in their revenue structures

State government revenue sources as a percentage of own-source revenue, 2016

				Selected tax revenue components				
	Own-source revenue total	Total non-tax own-source revenue	Total tax revenue	Individual income tax	General sales tax	Selective sales taxes	Property tax	Other tax revenue
United States	100.0	27.5	72.5	27.0	22.9	11.8	1.3	9.6
California	100.0	17.7	82.3	42.8	20.8	7.5	1.3	9.9
New Hampshire	100.0	39.8	60.2	2.0	-	22.4	9.3	26.5
New York	100.0	24.4	75.6	43.2	12.6	10.5	-	9.3
Ohio	100.0	33.6	66.4	18.9	28.3	13.9	-	5.3
Tennessee	100.0	24.6	75.4	1.8	39.5	15.2	-	18.9
Texas	100.0	34.0	66.0	-	40.6	18.0	-	7.3

Source: Census Bureau Annual Survey of State and Local Government Finances, 2016

As a harbinger of what we will learn from our income tax analysis, Table 6 shows how average income tax reported in the Current Population Survey falls between the age 50-64 group and the age 65-plus group. The decline is especially large in California and New York in both dollar and percentage terms. Average taxes are low in New Hampshire and Tennessee, and as noted above, the tax is being phased out in Tennessee, so prospectively the amounts will be zero. Texas has no income tax at all.

Table 6: Personal income tax falls sharply between the 50-64 and 65+ age groups in California and New York

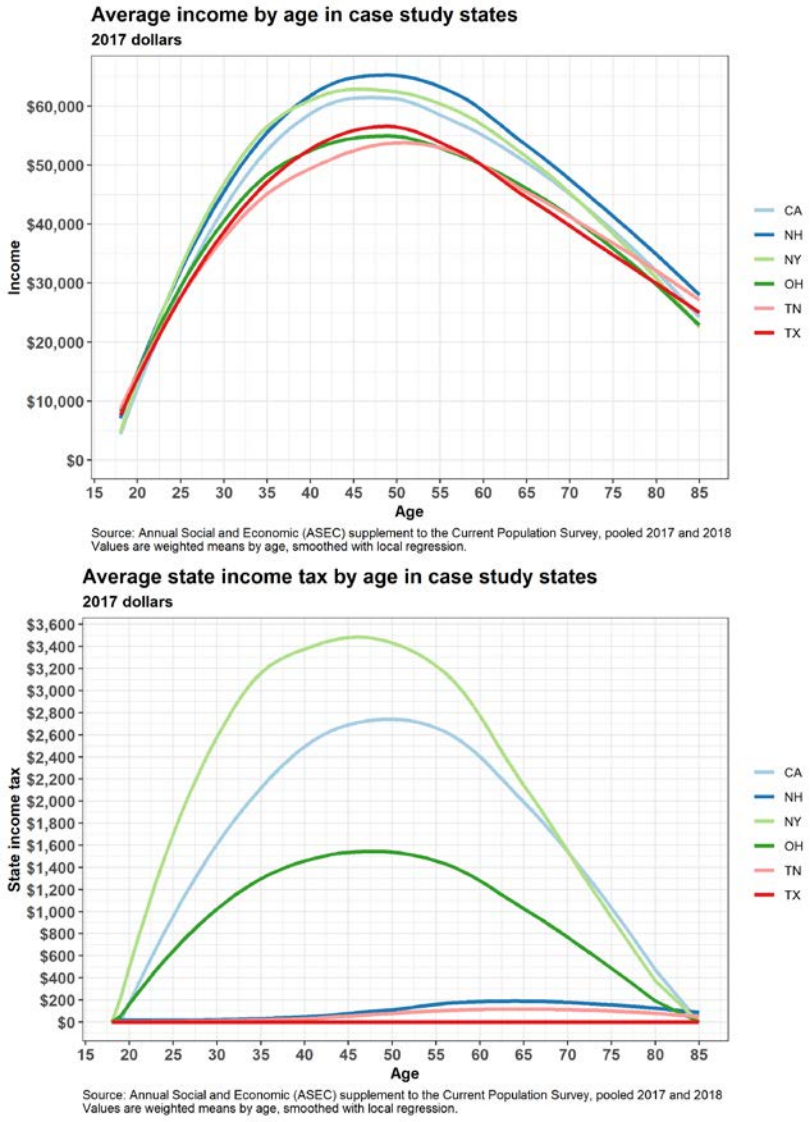
State and local income tax per person, selected ages, 2017 dollars

	Age 50-64	Age 65+	Difference	% difference
United States	$ 1,738	$ 697	$ (1,042)	(59.9)
California	2,564	1,160	(1,404)	(54.7)
New Hampshire	192	158	(34)	(17.9)
New York	3,164	1,042	(2,122)	(67.1)
Ohio	1,395	483	(912)	(65.4)
Tennessee	122	75	(46)	(38.1)
Texas	-	-	-	-

Source: Author's analysis of Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018.

Figure 12 shows money income and state and local personal income taxes across age groups for the six study states, from the Current Population Survey, with both income and taxes smoothed to make the general patterns clear. The top panel shows the income and the bottom panel shows income tax. Among other things, the figure shows that (a) income tax tends to fall off more sharply with age than does money income, and (b) the differences across states in income tax per person are quite large, with California, New York, and Ohio having much more at stake than the other three states. And as noted earlier, the already-small tax in Tennessee on interest and dividends is being phased out.

Figure 11: Income and income taxes fall in case-study states, but the effects are far more important in some states than others



Static point-in-time data like these do not tell the full story. For example, the income tax is larger in California than in Ohio and declines more in dollar terms as age increases, but Ohio faces different issues from California. California's working-age population is projected to grow 9.6 percent between 2020 and 2040, but Ohio's is projected to fall by 4.1 percent. If service demands and other spending pressures moved in lockstep with the working-age population, aging might not be a concern, but that is unlikely to be the case. For example, regardless of whether the working-age population grows or declines, many states will face increases in debt service and increases in pension contributions. A growing working-age population and associated growing tax revenue can help ease the burden of spending pressures that increase.

Sales tax structures will affect the impact of an aging population on sales tax revenue, and these structures vary across our case-study states. Five of our six study states have a general sales tax; New Hampshire does not. As noted earlier, Tennessee and Texas rely especially heavily on the sales tax. Four of the sales tax states exempt groceries, while Tennessee taxes them, but at a 4 percent state rate instead of the general state rate of 7 percent.[57] Clothing is taxable in four of the states, but largely exempt in New York. Nonprescription drugs are taxable in California, Ohio, and Tennessee, but exempt in New York and Texas.[58]

Finally, although the property tax is not an explicit part of this study, local government finances can have spillover effects on state finances, and the local property tax plays an important role. The extent to which localities rely on the property tax, and how property tax rules treat homeowners and senior citizens, will affect the impact of aging on the property tax. Table 7 shows that local governments in New Hampshire rely on the property tax far more heavily than do local governments in other states. To the extent that an aging population affects New Hampshire's property tax revenue, this could be a concern to the state.

Table 7: 4 Local governments in New Hampshire rely on the property tax for 84 percent of their own-source revenue

Local government revenue sources as a percentage of own-source revenue, 2016

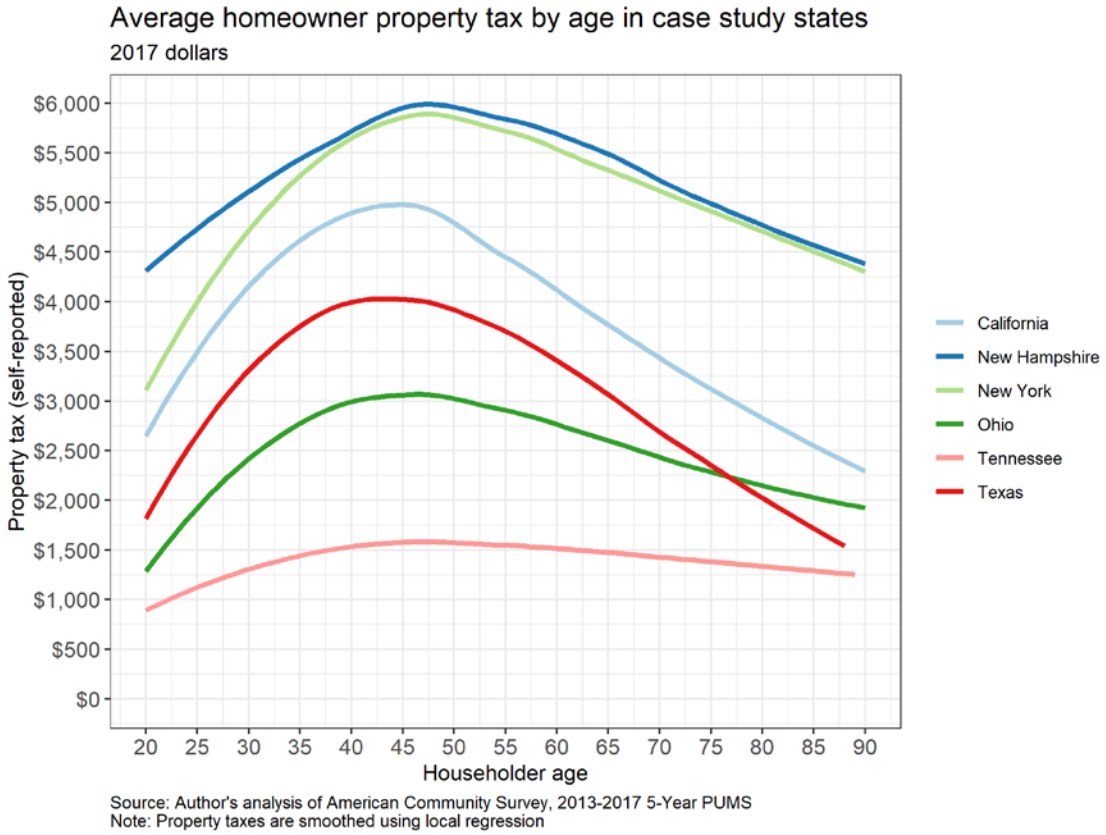
				Selected tax revenue components				
	Own-source revenue total	Total non-tax own-source revenue	Total tax revenue	Individual income tax	General sales tax	Selective sales taxes	Property tax	Other tax revenue
United States	100.0	35.3	64.7	3.1	8.2	3.1	46.6	3.7
California	100.0	45.5	54.5	-	8.6	3.7	38.3	3.9
New Hampshire	100.0	15.1	84.9	-	-	0.1	84.1	0.8
New York	100.0	22.7	77.3	9.3	13.0	1.9	44.3	8.8
Ohio	100.0	32.6	67.4	14.9	7.0	0.6	42.5	2.4
Tennessee	100.0	44.9	55.1	-	13.7	3.8	35.2	2.4
Texas	100.0	31.0	69.0	-	8.8	2.5	56.5	1.2

Source: Census Bureau Annual Survey of State and Local Government Finances, 2016

Figure 13 shows property taxes as reported in the Current Population Survey by age group for our case-study states. They generally fall after about age 45 or 50. The highest property taxes are in New Hampshire and New York. They appear to fall off the most in dollar terms in California, falling from about $5,000 per homeowner at age 45 to about $3,100 at age 75, a drop of $1,900. In New Hampshire, they fall from just under $6,000 to just under $5,000, a drop of about $1,000. It's not clear how much governments should worry about this. If the decline results from senior citizens moving into lower-valued homes, other people may be purchasing the higher-valued homes and paying higher taxes. If it is the result of special tax breaks for

older homeowners, it may be far more difficult for governments to make up for the revenue lost due to tax breaks.

Figure 12: Property taxes fall after about age 45 or 50, although the level of property taxes and rate of fall vary greatly across case-study states



Detailed analysis of individual states

We now proceed to analysis of the individual states, using the methods described in the section *Quantifying impacts*.

California

Income tax

The following table shows how California retirement income included in federal adjusted gross income changed from 2009 to 2016. Retirement income increased by 53.2 percent, while wage income increased by only 35.2 percent.

Table 8: California retirement income in the context of total AGI, 2009 and 2016

Retirement Income in Federal Adjusted Gross Income: California

Billions of dollars

				Change from 2009 to 2016	
	2009	**2016**	**% share of AGI in 2016**	**Dollar change**	**Percent change**
Adjusted gross income	$ 996.3	$ 1,413.5	100.0%	$ 417.2	41.9%
Salaries and wages	724.7	979.6	69.3%	254.9	35.2%
Net capital gains less loss	29.4	115.0	8.1%	85.6	291.3%
Taxable pensions	56.6	79.5	5.6%	22.9	40.4%
Taxable Social Security	18.1	29.6	2.1%	11.5	63.8%
Taxable IRA distributions	14.6	27.7	2.0%	13.1	89.5%
Retirement income	89.3	136.7	9.7%	47.5	53.2%
All other non-retirement income	152.9	182.2	12.9%	29.3	19.2%

Source: IRS Statistics of Income, Historical Table 2

The next table shows the results of our analysis of how an aging population could affect the income tax in California. While the analysis was conducted using detailed five-year age groups, for presentation purposes the table was collapsed into two age groups, less than 65 years and 65 years or more, plus a total.

The first column of numbers shows the estimated per-capita income tax in 2020 (in 2017 dollars, which is the year of our CPS data), by each age group. Average income tax for the 65+ age group was $1,172 per person, or about 15 percent less than the $1,381 average for the under-65 age group.

The next three columns show growth rates from 2020 to 2040, by age group. The total population is projected to grow 14.9 percent over those 20 years, with the elderly population growing 35.3 percent and the non-elderly population growing 11.5 percent.

The next column shows the impact of the changing age distribution on per-capita income tax revenue. Total per-capita income tax revenue would decline 3.2 percent over the 20 years, as an increasing share of the population moves into the low-tax older population group. *This is a key result.* Within the elderly group, the average tax also declines because people within the group are getting older and moving to even lower income tax levels.

The final column combines the two effects, showing total growth in the income tax by age group, before consideration of any inflationary effects. Thus, while the total population is expected to grow 14.9 percent over 20 years, total income tax is projected to grow only 11.2 percent.

Table 9: Potential impacts of population aging on income tax in California

Population and income tax changes for California

Amounts are in 2017 dollars

	Per-capita income tax in 2020	% change, 2020 to 2040		
		Population	Per-capita income tax	Total income tax
Population group				
< 65 years old	$ 1,381	11.5	(1.4)	10.0
Age 65+	1,172	35.3	(11.4)	19.9
Total	$ 1,351	14.9	(3.2)	11.2

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia, Updated December 2018, https://demographics.coopercenter.org/

Sales tax

The table below shows the results of our sales tax analysis for California. While the analysis was conducted using detailed 10-year age groups, for presentation purposes the table was collapsed into two age groups, household head less than 65 years old and 65 years or more, plus a total.

The first column shows estimated sales-taxable expenditures per household in 2020, by each age group. Average sales-taxable expenditures for the 65+ age group were $14,437 per household, or about 26 percent less than the $19,569 average for the under-65 age group.

The next three columns show growth rates from 2020 to 2040, by age group. The number of households is projected to grow 19.6 percent over those 20 years, with the number of elderly households growing 39.5 percent and non-elderly households growing 13.0 percent. The next column shows the impact of the changing age distribution on per-household sales-taxable expenditures. Total per-household taxable sales would decline 2.1 percent over the 20 years, as an increasing share of the households moves into the low-taxable-sales older household head group*, a key result*. Within the elderly group, average sales-taxable expenditures also decline because households within the group are getting older and moving to even lower taxable expenditure levels.

The final column combines the two effects, showing growth over the 20 years in sales-taxable expenditures by age group, before consideration of any inflationary effects. Thus, while the total number of households is expected to grow 19.6 percent over 20 years, sales-taxable purchases are projected to grow only 17.1 percent.

Table 10: Potential impacts of population aging on general sales tax in California

Household and taxable sales changes for California

Amounts are in 2017 dollars

		% change, 2020 to 2040		
	Per-household taxable sales in 2020	# of households	Per-household taxable sales	Total taxable sales
Age group				
< 65 years old	$ 19,569	13.0	0.4	13.5
Age 65+	14,437	39.5	(5.3)	32.1
Total	$ 18,290	19.6	(2.1)	17.1

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia (Updated 2018), https://demographics.coopercenter.org/

New Hampshire

New Hampshire's tax system is unusual in that it has neither a broad-based income tax (it only taxes interest and dividends) nor a broad-based sales tax. Instead, it gets much of its tax revenue from relatively heavy taxation of business profits and activities relative to other states, and from selected other taxes such as a meals and room tax and a 7 percent excise tax on telecommunications services. It also relies on state property taxes for a greater share of revenue than every other state. While these taxes will be affected by the aging population, it is difficult to predict exactly how, and we do not include them in our analysis below, except briefly in the section on other issues.

Income tax

The following table shows how New Hampshire retirement income included in federal adjusted gross income changed from 2009 to 2016. This is of only academic interest because the New Hampshire income tax is not a broad-based tax; it applies only to interest and dividends. Retirement income increased by 55.7 percent, while wage income increased by only 26.5 percent.

Table 11: New Hampshire retirement income in the context of total AGI, 2009 and 2016

Retirement Income in Federal Adjusted Gross Income: New Hampshire

Billions of dollars

				Change from 2009 to 2016	
	2009	**2016**	**% share of AGI in 2016**	**Dollar change**	**Percent change**
Adjusted gross income	$ 39.4	$ 51.6	100.0%	$ 12.2	31.1%
Salaries and wages	29.4	37.1	71.9%	7.8	26.5%
Net capital gains less loss	1.1	2.8	5.5%	1.8	168.0%
Taxable pensions	2.3	3.2	6.1%	0.8	35.0%
Taxable Social Security	0.9	1.6	3.1%	0.7	79.0%
Taxable IRA distributions	0.8	1.5	2.9%	0.7	90.7%
Retirement income	4.0	6.2	12.1%	2.2	55.7%
All other non-retirement income	4.9	5.4	10.5%	0.5	9.5%

Source: IRS Statistics of Income, Historical Table 2

The next table shows the results of our analysis of how an aging population could affect the income tax in New Hampshire. This is a narrow tax that only applies to interest and dividends, which are received disproportionately by older taxpayers, and it is a small tax by the standards of other states. Thus, its impact relative to the state budget will be smaller than in other states, and the age distribution of that impact will be different than in other states.

The first column shows the estimated per-capita income tax in 2020 by each age group. Average income tax for the 65+ age group was more than double the average for the under-65 age group. This is the opposite of what occurs in most other states and is a result of the fact that interest and dividends are skewed more heavily toward the elderly than most other income sources.

The next three columns show growth rates from 2020 to 2040, by age group. The total population is projected to grow 3.0 percent over those 20 years, with the elderly population growing 33.2 percent and the non-elderly population declining 4.1 percent. The next column shows the impact of the changing age distribution on per-capita income tax revenue. Total per-capita income tax revenue would decline 2.2 percent over the 20 years, a key result.

The final column combines the two effects, showing total growth in the income tax by age group, before consideration of any inflationary effects. While the total population is expected to grow 3.0 percent over 20 years, total income tax is projected to grow only 0.8 percent.

Table 12: Potential impacts of population aging on income tax in New Hampshire

Population and income tax changes for New Hampshire

Amounts are in 2017 dollars

		% change, 2020 to 2040		
	Per-capita income tax in 2020	Population	Per-capita income tax	Total income tax
Population group				
< 65 years old	$ 69	(4.1)	(10.8)	(14.5)
Age 65+	157	33.2	(3.0)	29.2
Total	$ 86	3.0	(2.2)	0.8

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia, Updated December 2018, https://demographics.coopercenter.org/

New York

Income tax

The following table shows how New York retirement income included in federal adjusted gross income changed from 2009 to 2016. Retirement income increased by 50.2 percent, while wage income increased by only 23.7 percent.

Table 13: New York retirement income in the context of total AGI, 2009 and 2016

Retirement Income in Federal Adjusted Gross Income: New York

Billions of dollars

				Change from 2009 to 2016	
	2009	**2016**	**% share of AGI in 2016**	**Dollar change**	**Percent change**
Adjusted gross income	$ 602.7	$ 769.6	100.0%	$ 166.9	27.7%
Salaries and wages	421.7	521.6	67.8%	99.9	23.7%
Net capital gains less loss	28.0	65.6	8.5%	37.6	134.0%
Taxable pensions	33.6	45.3	5.9%	11.8	35.0%
Taxable Social Security	12.5	19.6	2.5%	7.1	57.0%
Taxable IRA distributions	7.3	15.2	2.0%	7.9	108.4%
Retirement income	53.4	80.1	10.4%	26.8	50.2%
All other non-retirement income	99.6	102.3	13.3%	2.7	2.7%

Source: IRS Statistics of Income, Historical Table 2

The next table shows the results of our analysis of how an aging population could affect the income tax in New York.

The first column shows the estimated per-capita income tax in 2020 by each age group. Average income tax for the 65+ age group was about half the average for the under-65 age group.

The next three columns show growth rates from 2020 to 2040, by age group. The total population is projected to grow 4.2 percent over those 20 years, with the elderly population growing 18.0 percent and the non-elderly population growing 1.7 percent. The next column shows the impact of the changing age distribution on per-capita income tax revenue. Total per-capita income tax revenue would decline 2.9 percent over the 20 years, a key result.

The final column combines the two effects, showing total growth in the income tax by age group, before consideration of any inflationary effects. While the total population is expected to grow 4.2 percent over 20 years, total income tax is projected to grow only 1.2 percent.

Table 14: Potential impacts of population aging on income tax in New York

Population and income tax changes for New York

Amounts are in 2017 dollars

		% change, 2020 to 2040		
	Per-capita income tax in 2020	Population	Per-capita income tax	Total income tax
Population group				
< 65 years old	$ 2,017	1.7	(1.0)	0.6
Age 65+	1,025	18.0	(8.7)	7.7
Total	$ 1,862	4.2	(2.9)	1.2

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia, Updated December 2018, https://demographics.coopercenter.org/

Sales tax

The table below shows the results of our sales tax analysis for New York. The first column shows estimated sales-taxable expenditures per household in 2020. Expenditures for the 65+ age group were 20 percent less than the average for the under-65 age group.

The next three columns show growth rates from 2020 to 2040. The number of households is projected to grow 7.4 percent, with the number of elderly households growing 22.6 percent and non-elderly households growing 1.8 percent. The next column shows the impact of the changing age distribution on per-household sales-taxable expenditures. Total per-household taxable sales would decline 1.7 percent over the 20 years, as an increasing share of households moves into the lower-spending older group.

The final column combines the two effects, showing growth over the 20 years in sales-taxable expenditures by age group, before consideration of any inflationary effects. While the total number of households is expected to grow 7.4 percent over 20 years, sales-taxable purchases are projected to grow only 5.6 percent.

Table 15: Potential impacts of population aging on general sales tax in New York

Household and taxable sales changes for New York

Amounts are in 2017 dollars

		% change, 2020 to 2040		
	Per-household taxable sales in 2020	# of households	Per-household taxable sales	Total taxable sales
Age group				
< 65 years old	$ 21,146	1.8	0.3	2.1
Age 65+	16,890	22.6	(4.1)	17.5
Total	$ 19,991	7.4	(1.7)	5.6

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia (Updated 2018), https://demographics.coopercenter.org/

Ohio

Income tax

The following table shows how Ohio retirement income included in federal adjusted gross income changed from 2009 to 2016. Retirement income increased by 43.1 percent, while wage income increased by only 21.5 percent.

Table 16: Ohio retirement income in the context of total AGI, 2009 and 2016

Retirement Income in Federal Adjusted Gross Income: Ohio

Billions of dollars

				Change from 2009 to 2016	
	2009	**2016**	**% share of AGI in 2016**	**Dollar change**	**Percent change**
Adjusted gross income	$ 257.4	$ 325.6	100.0%	$ 68.2	26.5%
Salaries and wages	192.8	234.3	72.0%	41.5	21.5%
Net capital gains less loss	3.2	11.1	3.4%	7.9	242.7%
Taxable pensions	21.7	28.2	8.7%	6.5	29.8%
Taxable Social Security	5.7	9.3	2.9%	3.6	63.2%
Taxable IRA distributions	5.3	9.3	2.9%	4.0	76.0%
Retirement income	32.7	46.8	14.4%	14.1	43.1%
All other non-retirement income	28.7	33.4	10.3%	4.7	16.4%

Source: IRS Statistics of Income, Historical Table 2

The next table shows the results of our analysis of how an aging population could affect the income tax in Ohio.

The first column shows the estimated per-capita income tax in 2020 by each age group. Average income tax for the 65+ age group was about 44 percent less than the average for the under-65 age group.

The next three columns show growth rates from 2020 to 2040, by age group. The total population is projected to grow only 0.4 percent over those 20 years, with the elderly population growing 16.6 percent and the non-elderly population declining 3.0 percent. As noted in an earlier section, the working-age population is projected to decline 4.1 percent in Ohio, a potential concern. The next column shows the impact of the changing age distribution on per-capita income tax revenue. Total per-capita income tax revenue would decline 3.5 percent over the 20 years, a key result.

The final column combines the two effects, showing total growth in the income tax by age group, before consideration of any inflationary effects. While the total population is expected to grow 0.4 percent over 20 years, total income tax is projected to decline 3.1 percent.

Table 17: Potential impacts of population aging on income tax in Ohio

Population and income tax changes for Ohio

Amounts are in 2017 dollars

		% change, 2020 to 2040		
Population group	Per-capita income tax in 2020	Population	Per-capita income tax	Total income tax
< 65 years old	$ 852	(3.0)	(1.1)	(4.0)
Age 65+	473	16.6	(10.5)	4.4
Total	$ 787	0.4	(3.5)	(3.1)

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia, Updated December 2018, https://demographics.coopercenter.org/

Sales tax

The table below shows the results of our sales tax analysis for Ohio. The first column shows estimated sales-taxable expenditures per household in 2020. Expenditures for the 65+ age group were 20 percent less than the average for the under-65 age group.

The next three columns show growth rates from 2020 to 2040. The number of households is projected to grow only 1.9 percent, with the number of elderly households growing 19.7 percent and non-elderly households *declining* 5.2 percent. The next column shows the impact of the changing age distribution on per-household sales-taxable expenditures. Total per-household taxable sales would decline 2.4 percent over the 20 years, as an increasing share of households moves into the lower-spending older group.

The final column combines the two effects, showing growth over the 20 years in sales-taxable expenditures by age group, before consideration of any inflationary effects. While the total number of households is expected to grow 1.9 percent over 20 years, sales-taxable purchases are projected to decline 0.5 percent.

Table 18: Potential impacts of population aging on general sales tax in Ohio

Household and taxable sales changes for Ohio

Amounts are in 2017 dollars

		% change, 2020 to 2040		
	Per-household taxable sales in 2020	# of households	Per-household taxable sales	Total taxable sales
Age group				
< 65 years old	$ 23,026	(5.2)	0.2	(5.1)
Age 65+	18,459	19.7	(5.1)	13.6
Total	$ 21,717	1.9	(2.4)	(0.5)

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia (Updated 2018), https://demographics.coopercenter.org/

Tennessee

In 2016, Tennessee began phasing out its Hall income tax, a tax on interest and dividend income, though the state does not tax wage income.[59] Thus, we do not show the Tennessee interest and dividends tax here, as it will not be relevant.[60]

Sales tax

The table below shows the results of our sales tax analysis for Tennessee. The first column shows estimated sales-taxable expenditures per household in 2020. Expenditures for the 65+ age group were 18.5 percent less than the average for the under-65 age group.

The next three columns show growth rates from 2020 to 2040. The number of households is projected to grow 14.9 percent, with the number of elderly households growing 31.1 percent and non-elderly households growing 8.7 percent. The next column shows the impact of the changing age distribution on per-household sales-taxable expenditures. Total per-household taxable sales would decline 1.9 percent over the 20 years, as an increasing share of households moves into the lower-spending older group.

The final column combines the two effects, showing growth over the 20 years in sales-taxable expenditures by age group, before consideration of any inflationary effects. While the total number of households is expected to grow 14.9 percent over 20 years, sales-taxable purchases are projected to grow only 12.7 percent.

Table 19: Potential impacts of population aging on general sales tax in Tennessee

Household and taxable sales changes for Tennessee

Amounts are in 2017 dollars

		% change, 2020 to 2040		
	Per-household taxable sales in 2020	# of households	Per-household taxable sales	Total taxable sales
Age group				
< 65 years old	$ 25,961	8.7	(0.0)	8.6
Age 65+	21,150	31.1	(4.0)	25.8
Total	$ 24,623	14.9	(1.9)	12.7

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia (Updated 2018), https://demographics.coopercenter.org/

Texas

Texas does not have an income tax. The section below discusses the general sales tax.

Sales tax

The table below shows the results of our sales tax analysis for Texas. The first column shows estimated sales-taxable expenditures per household in 2020. Expenditures for the 65+ age group were 18.2 percent less than the average for the under-65 age group.

The next three columns show growth rates from 2020 to 2040. The number of households is projected to grow 38.4 percent, far faster than in any other case-study state, with the number of elderly households growing 60.2 percent and non-elderly households growing 32.1 percent. The next column shows the impact of the changing age distribution on per-household sales-taxable expenditures. Total per-household taxable sales would decline 1.6 percent over the 20 years, as an increasing share of households moves into the lower-spending older group.

The final column combines the two effects, showing growth over the 20 years in sales-taxable expenditures by age group, before consideration of any inflationary effects. While the total number of households is expected to grow 38.4 percent over 20 years, sales-taxable purchases are projected to grow 36.2 percent.

Table 20: Potential impacts of population aging on general sales tax in Texas

Household and taxable sales changes for Texas

Amounts are in 2017 dollars

		% change, 2020 to 2040		
	Per-household taxable sales in 2020	# of households	Per-household taxable sales	Total taxable sales
Age group				
< 65 years old	$ 22,724	32.1	(0.1)	32.0
Age 65+	18,595	60.2	(4.0)	53.8
Total	$ 21,799	38.4	(1.6)	36.2

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia (Updated 2018), https://demographics.coopercenter.org/

Cross-state comparisons of potential tax impacts

Income tax

Table 21 summarizes the potential impact on income taxes in the case-study states. The largest percentage impact on per-capita income tax is in Ohio, followed closely by California and then New York. Perhaps of great concern in Ohio, when we consider expected changes in the size of the population and the near-zero growth in Ohio, total income tax revenue is expected to decline. This appears to be consistent with projections in Ohio suggesting large impacts on the income tax, although there are some differences in methodology.[61] Although California faces the second-largest impact on per-capita income tax, robust population growth will lead it to have the fastest growth in overall income tax revenue. That is not necessarily a silver lining. The rapid growth in California's population may also lead to rapid growth in service demands.

Table 21: Summary of potential income tax impacts

Percentage change from 2020 to 2040 in projected population, per-capita income tax, and total income tax, 2017 dollars

	Percentage changes		
	Population	Per-capita income tax	Total income tax
California	14.9%	-3.2%	11.2%
New Hampshire	3.0%	-2.2%	0.8%
New York	4.2%	-2.9%	1.2%
Ohio	0.4%	-3.5%	-3.1%
Tennessee	14.0%	n/a	n/a
Texas	35.2%	n/a	n/a

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia, Updated December 2018, https://demographics.coopercenter.org/.

It is important to keep these numbers in perspective. While a projected decline in per-capita revenue is never good news for policymakers trying to balance budgets, these are changes that are projected to roll out over 20 years. In 2009, as a result of the Great Recession, California's income tax declined by 20.4 percent and Ohio's declined by 15.5 percent, *in a single year*.[62] Declines of 3 to 3.5 percent over 20 years seem small in comparison. While this report has not focused on expenditure impacts of an aging population, the spending pressures created by an aging population could be more important than the revenue impacts.

Sales tax

Table 22: summarizes the potential impact on general sales taxes in the case-study states. The largest percentage impact on per-capita general sales tax is in Ohio, followed by California and then Tennessee. As with the income tax in Ohio, when we consider expected slow growth in the number of households, total general sales tax revenue is expected to decline slightly. Although California faces the second-largest impact just as it did with the income tax, robust population growth will lead it to have the second-fastest growth in overall general sales tax revenue, after rapidly growing Texas.

Table 22: Summary of potential general sales tax impacts

Percentage change from 2020 to 2040 in projected # households, per-household taxable sales, and total taxable sales, 2017 dollars

	Percentage changes		
	# of Households	Per-household taxable sales	Total taxable sales
California	19.6%	-2.1%	17.1%
New Hampshire	4.1%	n/a	n/a
New York	7.4%	-1.7%	5.6%
Ohio	1.9%	-2.4%	-0.5%
Tennessee	14.9%	-1.9%	12.7%
Texas	38.4%	-1.6%	36.2%

Source: Author's analysis of Consumer Expenditure Survey data on purchases, Weldon Cooper population projections (Updated December 2018), and state tax laws.

As with the income tax, these changes are projected to roll out over 20 years. In 2009, as a result of the Great Recession, California's income tax declined by 9.4 percent and Ohio's declined by 6.8 percent, *in a single year*.[63] Declines of 2.1 and 2.4 percent over 20 years again seem small in comparison.

Implications relative to own-source revenue

Table 23: shows the potential per-capita income and sales tax changes side by side and shows the income and sales tax changes as a percentage of own-source revenue, to put these potential changes into the overall budgetary context. California faces the largest changes relative to its own-source revenue, followed by New York and then Ohio. The impact in New Hampshire rounds to zero as a percentage of own-source revenue because the income tax is narrow and small relative to its overall budget. That does not mean New Hampshire won't have its tax revenue affected by population aging, but the impact on these two sources will be small relative to its overall budget. As several studies have noted, it will face some expenditure challenges due to the aging population.[64]

Table 23: Summary of potential income and sales tax changes, and combined impact

Summary of potential revenue impact, per capita

	Percentage change in per-capita tax due to moving from 2020 to 2040 age composition		Combined income and sales tax impact as % of own-source revenue
	Personal income tax	General sales tax	
California	-3.2%	-2.1%	-1.8%
New Hampshire	-2.2%	n/a	0.0%
New York	-2.9%	-1.7%	-1.4%
Ohio	-3.5%	-2.4%	-1.3%
Tennessee	n/a	-1.9%	-0.7%
Texas	n/a	-1.6%	-0.7%

Source: Author's analysis of multiple data sources. See text for details.

Conclusion

States will face many challenges from the aging of the population. In general, tax revenue growth is likely to slow as a result of population aging. States may face new spending pressures in health care programs and possibly pensions, but also may obtain some relief for K-12 education and other programs that benefit younger cohorts. It is important for states to forecast, monitor, and make plans to address these trends.

Appendices

How state analysts can estimate state tax revenue impacts from an aging population

This appendix describes in greater detail than the report body how we have quantified potential impacts of an aging population on income and sales taxes, using methods and data sources that could be applied in any state. It is based upon the approach taken in a paper by Alison Felix and Kate Watkins published by the Federal Reserve Bank of Kansas City, with updated data and with a few relatively small enhancements.[65] The approach is valuable for identifying the nature of the impacts on individual states and their approximate magnitudes, and for understanding which states may be most affected and which least affected. We do not assert that it will result in precise estimates, or that the estimates take all important factors into account. In most cases, analysts in individual states working with population forecasts available from in-state forecasters and with other data tailored to their questions at hand are likely to improve upon what we do here.

The overall approach is to estimate how much a state's income tax revenue would change, and how much its sales-taxable sales would change, both per person and in percentage terms if the age composition of the population projected for 2040 were in place rather than the composition in 2020.

This approach isolates the impact of the changing age composition, but it does not put estimates in a budgeting context, in which forecasters anticipate growth in tax revenue, and may be concerned about the extent to which that growth will slow or accelerate as a result of population aging. This growth perspective may be especially important to analysts in states in which the working-age population is expected to decline or slow dramatically, potentially retarding revenue growth substantially.

Income tax

The steps in estimating the impact of the changing age composition of the population on the income tax in a given state are as follows:

1. Estimate average state income tax by five-year age groups using data from the Current Population Survey's Annual Social and Economic Supplements, pooled for 2017 and 2018 to reduce the error in the estimates, and adjusted to 2017 income levels.[66]
2. Merge these data with population projections data for 2020 and 2040 for the same five-year age groups, from the Weldon Cooper Center for Public Service at the University of Virginia.
3. Calculate the impact of the changing age distribution of the population:
    a. Calculate average tax revenue per person using the 2020 and 2040 age distributions, with total population fixed at 2020 levels. In other words, multiply average income tax in each age group by the share of the population in that age group in 2020 and in 2040, and calculate the average tax in each year, across all age groups. The difference between the estimates with the 2020 age distribution and the 2040 age distribution shows the pure impact of the projected change in the age composition of the population, holding total population constant.

b. Calculate total income tax in each year, using projected population totals for 2020 and 2040. This captures both the change in composition of the population and change in the size of the population.

Table 24 below gives an example of the results of this analysis for the state of California. In the sections that follow we have a similar table for each case-study state that has an income tax. The way to read the table is as follows:

- While the analysis was conducted using detailed five-year age groups, for presentation purposes the table was collapsed into two age groups, less than 65 years and 65 years or more, plus a total.
- The first column of numbers shows the estimated per-capita income tax in 2020 (in 2017 dollars, which is the year of our CPS data), by each age group. Average income tax for the 65+ age group was $1,172 per person, or about 15 percent less than the $1,381 average for the under-65 age group.
- The next three columns show growth rates from 2020 to 2040, by age group:
    - The total population is projected to grow 14.9 percent over those 20 years, with elderly population growing 35.3 percent and the non-elderly population growing 11.5 percent.
    - The next column shows the impact of the changing age distribution on per-capita income tax revenue. Total per-capita income tax revenue would decline 3.2 percent over the 20 years, as an increasing share of the population moves into the low-tax older population group. Within the elderly group, the average tax also declines because people within the group are getting older and moving to even lower income tax levels.
    - The final column combines the two effects, showing total growth in the income tax by age group, before consideration of any inflationary effects. Thus, while the total population is expected to grow 14.9 percent over 20 years, total income tax is projected to grow only 11.2 percent.

Table 24: Potential impact of an aging population on the California state income tax

Population and income tax changes for California

Amounts are in 2017 dollars

		% change, 2020 to 2040		
	Per-capita income tax in 2020	Population	Per-capita income tax	Total income tax
Population group				
< 65 years old	$ 1,381	11.5	(1.4)	10.0
Age 65+	1,172	35.3	(11.4)	19.9
Total	$ 1,351	14.9	(3.2)	11.2

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia, Updated December 2018, https://demographics.coopercenter.org/

Sales tax

The steps in estimating the impact of the changing age composition of the population on the sales tax in a given state are as follows:

1. Estimate average state-taxable sales by households in 10-year age groups as categorized in the Consumer Expenditure Survey for 2017, using data for the nation as a whole because state-level data are not available, but adjusting for differences in state tax bases, as follows:[67]
    a. For each expenditure category in the Consumer Expenditure Survey, determine whether the category is fully taxable under the state's sales tax, fully exempt, or partly taxable.[68]
    b. We based these determinations on multiple sources, primarily including the Federation of Tax Administrators 2017 Sales Taxation of Services[69] and analysis by the Tax Foundation.[70]
2. Because the Consumer Expenditure Survey summarizes expenditures by households rather than individuals, but the Weldon Cooper population projections are for numbers of people, we needed to construct a crosswalk between projections of people and what we desired, which was projections of households. We constructed a crosswalk on the relationship between the number of people and the number of households, by state and age group, from the five-year public use microdata from the American Community Survey for 2013-2017. We then assumed that the relationship between persons and households would remain constant in the projection period, which allowed us to develop projections for 2020 and 2040 of the numbers of households by state and age group used in the Consumer Expenditure Survey, consistent with the Weldon Cooper population projections.[71]

3. Merge the taxable Consumer Expenditure Data from Step 1 with the household projections from Step 2 by state and 10-year age groups.
4. Calculate the impact of the changing age distribution of the population using a conservative approach.[72]
    a. Calculate average state-taxable sales per household using the 2020 and 2040 age distributions, with the total number of households fixed at 2020 levels. In other words, multiply average state-taxable sales in each age group by the share of households that are in that age group in 2020 and in 2040 and calculate the average state-taxable sales in each year, across all age groups. The difference between the estimates with the 2020 age distribution and the 2040 age distribution shows the pure impact of the projected change in the age composition of households, holding the total number of households constant.
    b. Calculate total state taxable sales in each year, using projected household totals for 2020 and 2040. This captures both the change in age composition of the households and change in the number of households.

Table 25 below gives an example of the results of this analysis for California, through Step 4 above. We show the results of Step 5 in a cross-state comparison, but not for each individual state. In the sections that follow we have a similar table for each case-study state that has a state general sales tax. The way to read the table is as follows:

- While the analysis was conducted using detailed 10-year age groups, for presentation purposes the table was collapsed into two age groups, household head less than 65 years old and 65 years or more, plus a total.
- The first column of numbers shows the estimated per-household sales-taxable expenditures in 2020 (in 2017 dollars, which is the year of our Consumer Expenditure Survey data), by each age group. Average sales-taxable expenditures for the 65+ age group was $14,437 per household, or about 26 percent less than the $19,569 average for the under-65 age group.
- The next three columns show growth rates from 2020 to 2040, by age group:
    - The total number of households is projected to grow 19.6 percent over those 20 years, with the number of elderly households growing 39.5 percent and the non-elderly households growing 13.0 percent.
    - The next column shows the impact of the changing age distribution on per-household sales-taxable expenditures. Total per-household taxable sales would decline 2.1 percent over the 20 years, as an increasing share of the households moves into the low-taxable-sales older household head group. Within the elderly group, average sales-taxable expenditures also decline because households within the group are getting older and moving to even lower taxable expenditure levels.
    - The final column combines the two effects, showing total growth in sales-taxable expenditures by age group, before consideration of any inflationary effects. Thus, while the total number of households is expected to grow 19.6 percent over 20 years, total sales tax purchases are projected to grow only 17.1 percent.

Table 25: Potential impact of an aging population on California sales-taxable sales

Household and taxable sales changes for California

Amounts are in 2017 dollars

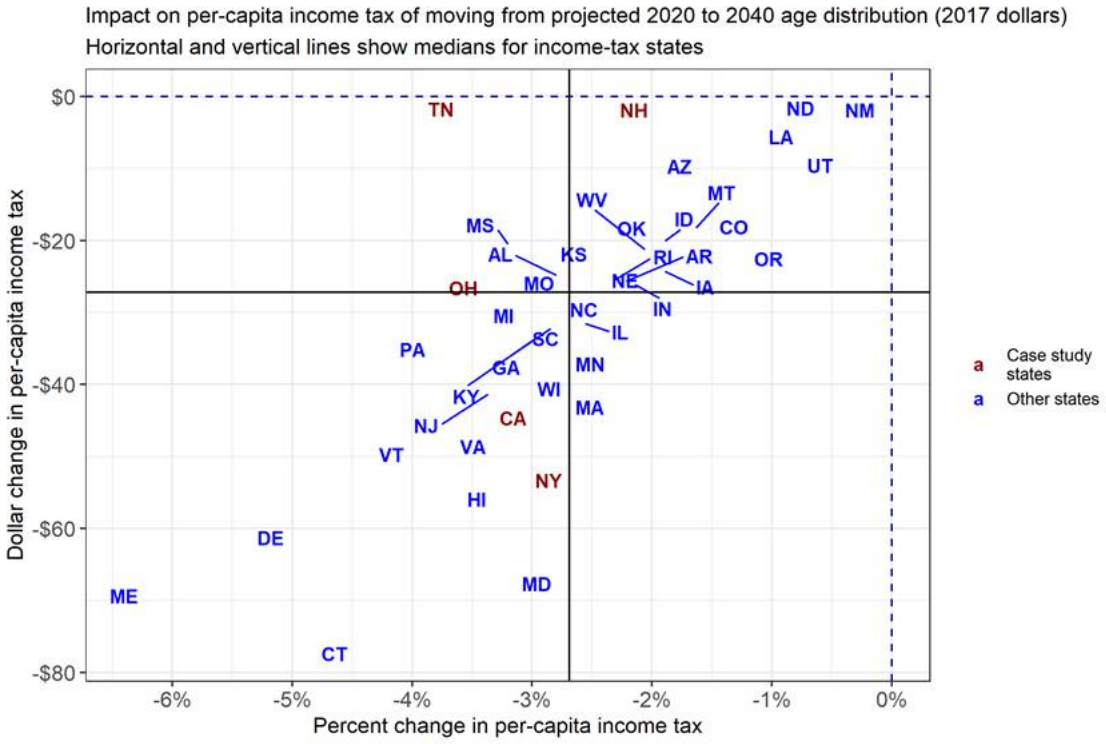
		% change, 2020 to 2040		
	Per-household taxable sales in 2020	# of households	Per-household taxable sales	Total taxable sales
Age group				
< 65 years old	$ 19,569	13.0	0.4	13.5
Age 65+	14,437	39.5	(5.3)	32.1
Total	$ 18,290	19.6	(2.1)	17.1

Source: Author's analysis of (1) data from the Annual Social and Economic (ASEC) supplement to the Current Population Survey, pooled 2017 and 2018, and (2) projections from the Weldon Cooper Center for Public Service, University of Virginia (Updated 2018), https://demographics.coopercenter.org/

Estimated income tax impact for all 50 states

Figure 14 below shows the estimated impact of the changing age composition of the population on all 50 states, in percentage change terms and in dollars per capita.

Figure 13: Change in income tax revenue from moving to the 2040 age distribution from the 2020 distribution



Source: Author's analysis of data from Current Population Survey and from University of Virginia, Weldon Cooper Center for Public Service, updated December 2018.
Notes: (1) States without broad-based income taxes excluded (including case-study state Texas). (2) Analysis is similar to Felix & Watkins 2013, with updated information.

Endnotes

[1] Based on data reported by the Bureau of the Census, which are intended to be reasonably comparable across states. States' own numbers could differ, but likely not greatly.
[2] Press reports describe the 2018 level as a record high. For earlier years see https://population.un.org/wpp/Download/Files/1_Indicators%20(Standard)/EXCEL_FILES/1_Population/WPP2019_POP_F05_MEDIAN_AGE.xlsx. We use data from the United Nations for earlier years because it is provided in a far more useful format than data from the U.S. Bureau of the Census and is based upon data provided by the bureau.
[3] We use data from the United Nations for forecast years because it is provided in a far more useful format than data from the U.S. Bureau of the Census and is broadly consistent with other forecasts. See https://population.un.org/wpp/Download/Files/1_Indicators%20(Standard)/EXCEL_FILES/1_Population/WPP2019_POP_F05_MEDIAN_AGE.xlsx.
[4] National Research Council. *Aging and the Macroeconomy: Long-Term Implications of an Older Population* (Washington, D.C.: National Academies Press, 2012), https://doi.org/10.17226/13465.
[5] According to the Centers for Disease Control and Prevention. See https://www.cdc.gov/nchs/fastats/life-expectancy.htm.
[6] *Aging and the Macroeconomy*. Pp.32-35
[7] *Aging and the Macroeconomy*. Table 3-1.
[8] "The 2018 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds" (The Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds, June 2018), https://www.ssa.gov/oact/tr/2018/tr2018.pdf. Table V.A5. The SSA's life expectancy projections are somewhat lower than those presented in *Aging and the Macroeconomy*. We use them here because they provide a long historical time series in addition to projections. NOTE: SSA publishes estimates for males and females separately. The graph shows the simple average of the two. This will understate expectancy slightly because of the higher proportion of females in the population.
[9] *Aging and the Macroeconomy*; Andrew Fenelon, "Geographic Divergence in Mortality in the United States," *Population and Development Review* 39, no. 4 (December 2013): 611–34, https://doi.org/10.1111/j.1728-4457.2013.00630.x; John R. Wilmoth, Carl Boe, and Magali Barbieri, "Geographic Differences in Life Expectancy at Age 50 in the United States Compared with Other High-Income Countries," in *International Differences in Mortality at Older Ages: Dimensions and Sources* (Washington, D.C.: National Academies Press, 2011), https://doi.org/10.17226/12945.
[10] According to the Social Security Administration, "The total fertility rate may be interpreted as the average number of children that would be born to a woman in her lifetime if she were to experience, at each age of her life, the birth rate observed in, or assumed for, a specified year, and if she were to survive the entire childbearing period. A rate of about 2.1 would ultimately result in a nearly constant population if immigration and emigration were both zero, and if death rates were to remain at current levels." "The 2018 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds."
[11] "The 2018 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds." Table V.A1.
[12] For interesting discussions of this issue, see Alicia H Munnell, Anqi Chen, and Geoffrey T Sanzenbacher, "Is the Drop in Fertility Temporary or Permanent?" (Center for Retirement Research at Boston College, July 2018); "Most Parents in U.S. Say They Probably Won't Have More Kids," Pew Research Center, December 12, 2018, https://www.pewresearch.org/fact-tank/2018/12/12/most-parents-and-many-non-parents-dont-expect-to-have-kids-in-the-future/; and Ariana Eunjung Cha, "As U.S. Fertility Rates Collapse, Finger-Pointing and Blame Follow," The Washington Post, October 19, 2018, https://www.washingtonpost.com/health/2018/10/19/us-fertility-rates-collapse-finger-pointing-blame-follow/?utm_term=.3dd3cc8b8a27.
[13] Different studies use slightly different cut points to define these groups. We use these breaks because they are broadly consistent with other studies and match well with age groupings available in state-specific population forecasts we will use later, from the Weldon Cooper Center for Public Service at the University of Virginia.
[14] This figure and several others use data from the United Nations because the data are provided in age groups and for time periods that are relevant here. The Census Bureau does not provide the data in a similarly useful format.
[15] *Aging and the Macroeconomy*.

[16] Economists sometimes decompose economic growth in ways that can provide useful insights into the impact of demographic changes, that break economic growth down into several factors. A common approach is known as Shapley decomposition, often used by the World Bank. See http://siteresources.worldbank.org/INTEMPSHAGRO/Resources/2743772-1239047170644/Guide_to_Growth_Employment_and_Productivity_Analysis.pdf. Growth in per-capita gross domestic product can be decomposed into growth in the workforce and growth in workforce productivity: All else equal, more workers will lead to greater GDP growth, and higher productivity will lead to greater GDP growth. Workforce growth can then be decomposed into changes in the working-age population and changes in the fraction of this population that is employed. Further decomposition is possible. For example, the fraction of the working-age population that is employed can be decomposed into the fraction of the working-age population that is participating in the labor force (working or seeking work) and the fraction of people in the labor force who have jobs.

[17] *Aging and the Macroeconomy*. See p.6.

[18] David Bloom, David Canning, and Günther Fink, "Implications of Population Aging for Economic Growth" (Cambridge, MA: National Bureau of Economic Research, January 2011), https://doi.org/10.3386/w16705.

[19]Joshua Montes, "CBO's Projection of Labor Force Participation Rates," Working Paper, Working Paper Series (Congressional Budget Office, March 2018), www.cbo.gov/publication/53616. Also see Audrey Breitwieser, Ryan Nunn, and Jay Shambaugh, "The Recent Rebound in Prime-Age Labor Force Participation," August 2, 2018, https://www.brookings.edu/blog/up-front/2018/08/02/the-recent-rebound-in-prime-age-labor-force-participation/.

[20] Nicole Maestas, Kathleen J. Mullen, and David Powell, "The Effect of Population Aging on Economic Growth, the Labor Force and Productivity," NBER Working Paper, July 2016, https://www.nber.org/papers/w22452.pdf.

[21] For example, the Committee on the Long-Run Macroeconomic Effects of the Aging U.S. Population examined research on aging and housing values, and concluded "The committee does not believe there is evidence that the value of housing will decline because of demographic-related shifts in household composition." Nicole Maestas, Kathleen J. Mullen, and David Powell.

[22] "University of Virginia Weldon Cooper Center, Demographics Research Group," December 2018, https://demographics.coopercenter.org/ .

[23] "State and National Projections Methodology" (University of Virginia Weldon Cooper Center, Demographics Research Group, December 2018), https://demographics.coopercenter.org/sites/demographics/files/2019-02/NationalProjections_MethodologyOverview_Dec2018.pdf.

[24] See https://demographics.coopercenter.org/sites/demographics/files/2019-01/NationalProjections_ProjectedAgeSexDistribution_2020-2040_Updated12-2018_0.xls.

[25] Calculated by the author from the cited source data.

[26] Calculated by author from source data. U.S. Bureau of the Census, Annual Survey of State and Local Government Finances, 2016.

[27] This statement is based, among other things, on analysis of the Annual Social and Economic Supplement to the Current Population Survey, as discussed in more detail below.

[28] For example, chart A1 in Alison Felix and Kate Watkins, "The Impact of an Aging U.S. Population on State Tax Revenues," 2013, 34, based upon data from a special IRS study in 2008 shows that people age 65 and over rely especially heavily on capital gains, dividends, and interest income. Data from the Social Security Administration (https://www.ssa.gov/policy/docs/chartbooks/income_aged/2014/iac14.html) show that the most common source of income for people aged 65 or older was Social Security payments, followed by income from assets, and retirement benefits other than Social Security.

[29] The data in the table are available by state from the IRS.

[30] Consumer prices: Consumer Price Index: All Items for the United States [USACPIALLAINMEI], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/USACPIALLAINMEI, March 24, 2019.

[31] This point was made in Jon Honeck and Matt Bird, "Aging Ohio: The Impact of Demographic Change on State Fiscal Policy" (The Center for Community Solutions, October 2014). See p.25 of their report.

[32] The rate at which this occurs will be affected by, among other things, interest rates and the changing availability and use of DB and DC pension plans.

[33] Liz Malm, Richard Borean, and Dan Carvajal, "Monday Map: State Income Taxes on Social Security Benefits," The Tax Foundation, September 30, 2013, https://taxfoundation.org/monday-map-state-income-taxes-social-security-benefits/.
[34] Author's analysis of: Rick Olin, "Individual Income Tax Provisions in the States" (Wisconsin Legislative Fiscal Bureau, January 2019).
[35] See Table 1 of Rick Olin.
[36] Jeffrey R. Brown, "Including Retirement Income in the Illinois Income Tax Base," Illinois Budget Policy Toolbox (University of Illinois Institute of Government and Public Affairs, February 27, 2014).
[37] B. Edwards and S. Wallace, "State Income Tax Treatment of the Elderly," *Public Budgeting & Finance* 24, no. 2 (2004): 1–20.
[38] Amy Rehder Harris and Michael Lipsman, "The Elderly Population and Iowa Tax Revenues: As One Goes Up, Must the Other Come Down?," September 2006, 28; see p.8.
[39] Katy Coba and Kate Brown, "Oregon Economic and Revenue Forecast," December 2018, https://www.oregon.gov/das/OEA/Documents/forecast1218.pdf.
[40] Michael D. Hurd and Susann Rohwedder, "Heterogeneity in Spending Change at Retirement," *The Journal of the Economics of Ageing* 1–2 (November 2013): 60–71, https://doi.org/10.1016/j.jeoa.2013.09.002; Michael D. Hurd and Susann Rohwedder, "Some Answers to the Retirement-Consumption Puzzle" (National Bureau of Economic Research, 2006), http://www.nber.org/papers/w12057; Sudipto Banerjee, "Change in Household Spending After Retirement: Results from a Longitudinal Sample," 2015, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2694747.
[41] See Banerjee, "Change in Household Spending After Retirement."
[42] One reviewer noted that middle-aged individuals also tend to spend more on younger and elder dependents and to assist with payments for grandchildren.
[43] Ann C. Foster, "A Closer Look at Spending Patterns of Older Americans," Beyond the Numbers (U.S. Bureau of Labor Statistics, March 2016), https://www.bls.gov/opub/btn/volume-5/pdf/spending-patterns-of-older-americans.pdf.
[44] "Oklahoma Sales Tax Relief Credit," Oklahoma Department of Rehabilitation Services, 2019, http://www.okdrs.org/guide/ok-sales-tax-relief-credit-ind; "Sales Tax Relief Credit," *Oklahoma Policy Institute* (blog), February 5, 2015, https://okpolicy.org/sales-tax-relief-credit/.
[45] In that paper, the authors treated spending on apparel, transportation, entertainment, personal care products, food away from home, alcohol, tobacco products, reading material, housing costs other than shelter, and miscellaneous items as subject to tax under the typical sales tax. We do the same here. Alison Felix and Kate Watkins, "The Impact of an Aging U.S. Population on State Tax Revenues," *Economic Review-Federal Reserve Bank of Kansas City*, 2013, 5, http://search.proquest.com/openview/3767a8970c3b5ad823b7711b72a4ff72/1?pq-origsite=gscholar&cbl=47211.
[46] Calculated from Table 1300 in the Consumer Expenditure Survey.
[47] Felix and Watkins, "The Impact of an Aging U.S. Population on State Tax Revenues."
[48] "State Tax Preferences for Elderly Taxpayers" (Institute on Taxation and Economic Policy, November 2016), https://itep.org/wp-content/uploads/srtaxprefpb112016.pdf.
[49] The Kaiser Family Foundation notes that state Medicaid costs are affected by Medicare costs as well, because states share in certain premium and other payments to Medicare for "dual-eligible" beneficiaries who qualify for both programs. Total Medicaid costs for Medicare are relatively small, accounting for less than 4 percent of total Medicaid costs. See Robin Rudowitz, Kendal Orgera, and Elizabeth Hinton, "Medicaid Financing: The Basics," The Henry J. Kaiser Family Foundation, March 21, 2019, https://www.kff.org/medicaid/issue-brief/medicaid-financing-the-basics/view/print/.
[50] John Holahan and Stacey McMorrow, Urban Institute, "Slow Growth in Medicare and Medicaid Spending per Enrollee Has Implications for Policy Debates," February 2019, 12.
[51] NHE Fact Sheet, Centers for Medicare & Medicaid Services, last modified April 26, 2019, https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nhe-fact-sheet.html. Calculated by author from NHE Projections 2018-2027, Table 3.
[52] Sally Wallace, "The Effects of Economic and Demographic Changes on States and Local Budgets," 1995, http://eric.ed.gov/?id=ED394187.

[53] Michael B Berkman and Eric Plutzer, "Gray Peril or Loyal Support? The Effects of the Elderly on Educational Expenditures," *Social Science Quarterly*, December 2004, 16.
[54] William Duncombe, Mark Robbins, and Jeffrey Stonecash, "Measuring Citizen Preferences for Public Services Using Surveys: Does a 'Gray Peril' Threaten Funding for Public Education?," *Public Budgeting & Finance* 23, no. 1 (March 2003): 45–72, https://doi.org/10.1111/1540-5850.2301003.
[55] Randall Reback, "Buying Their Votes? A Study of Local Tax-Price Discrimination: Local Tax-Price Discrimination," *Economic Inquiry* 53, no. 3 (July 2015): 1451–69, https://doi.org/10.1111/ecin.12174.
[56] See Felix and Watkins, "The Impact of an Aging U.S. Population on State Tax Revenues." One enhancement is an adjustment for changes in anticipated household size over time. Another is adjustment for differences in state sales tax bases.
[57] See https://revenue.support.tn.gov/hc/en-us/articles/202989425-What-are-the-state-and-local-sales-tax-rates-in-Tennessee-.
[58] Based upon analysis of "Sales Taxation of Services Survey: 2017 Update" (Federation of Tax Administrators, n.d.), https://www.taxadmin.org/assets/docs/Publications/Services/services2017.xlsx, and Walczak, Drenkard, and Bishop-Henchman, "2018 State Business Tax Climate Index."
[59] Walczak, Drenkard, and Bishop-Henchman, "2018 State Business Tax Climate Index."
[60] We did do calculations for Tennessee and found that the per-capita income tax would decline 3.8 percent as a result of population aging, which is large in percentage terms compared to other case-study states, but the per-capita decline was only $45, which was small because the tax is small in relative terms. Again, because the tax is being phased out we do not include it in the body of the report.
[61] Jon Honeck and Matt Bird, "Aging Ohio: The Impact of Demographic Change on State Fiscal Policy."
[62] Based on data reported by the Bureau of the Census, which are intended to be reasonably comparable across states. States' own numbers could differ, but likely not greatly.
[63] Based on data reported by the Bureau of the Census, which are intended to be reasonably comparable across states. States' own numbers could differ, but likely not greatly.
[64] See, for example: Sam Libby and Katie Schultz, "The Silver Tsunami: Analyzing the Impact of New Hampshire's Aging Population," PRS Policy Brief, Policy Research Shop (Presented to Representative Neal Kurk, Chairman, House Finance Committee: The Nelson A. Rockefeller Center at Dartmouth College), July 18, 2016, https://rockefeller.dartmouth.edu/sites/rockefeller.drupalmulti-prod.dartmouth.edu/files/silver_tsunami_final_081716.pdf; Steve Norton, "Looking Down the Fiscal Road: What Lies Ahead for New Hampshire's Long-Term Finances?" (New Hampshire Center for Public Policy Studies, April 2015); Jesse Devitte et al., "New Hampshire's Demographic Challenges and the Role of State Government" (New Hampshire Center for Public Policy Studies, February 18, 2016).
[65] See Felix and Watkins, "The Impact of an Aging U.S. Population on State Tax Revenues."
[66] Income taxes are estimated by the Bureau of the Census using a simulation model. In most states, the state income tax variable in the CPS ASEC represents state income taxes. In states with large enough local taxes, it will also include local taxes. Correspondence with Bruce Webster, tax modeler for the U.S. Bureau of the Census, February 14, 2017. Adjusted to 2017 using the CPI-U Consumer Price Index for all urban consumers.
[67] Table 1300. Age of reference person: Annual expenditure means, shares, standard errors, and coefficients of variation, Consumer Expenditure Survey, 2017.
[68] This is different from the approach in Felix and Watson, which used national-average sales tax treatment of items in the Consumer Expenditure Survey.
[69] Ronald Alt, Federation of Tax Administrators, "Services 2017," May 15, 2017, https://www.taxadmin.org/assets/docs/Publications/Services/services2017.xlsx.
[70] Walczak, Drenkard, and Bishop-Henchman, "2018 State Business Tax Climate Index."
[71] This is similar to the approach taken in Jon Honeck and Matt Bird, "Aging Ohio: The Impact of Demographic Change on State Fiscal Policy."
[72] This approach is more likely to overstate the impact on sales taxes than understate it. Because the Consumer Expenditure Survey data pertain to purchases by households, but state sales taxes raise considerable revenue from business purchases as well, the changes computed in Step 4 for households could be larger than the changes that would be seen for the sales tax as a whole, because business purchases would not be directly affected by the aging population. However, if we assume that sales taxes on business purchases are forward-shifted into prices, which is a common assumption, then aging of the population will affect those purchases as well. Implicitly, this assumes

that business purchase costs will be distributed among age groups in the same way that direct purchases by individuals are distributed, which may be overly conservative. We prepared alternative estimates that netted out state-specific estimates of business purchases as a share of the state sales tax, which might understate impacts because it presumes that no business costs are passed forward to elderly households. This approach reduced the projected impact on the sales tax by about 40 to 50 percent depending on the state, and again, likely understates the impact. We constructed estimates of the business share of the sales tax, by state, from a report that estimated taxes paid by business prepared by Ernst & Young for the Council on State Taxation, "Total State and Local Business Taxes: State-by-State Estimates for Fiscal Year 2017."