The Local Fiscal and Economic Effects of Population Aging*

Travis St.Clair

September 25, 2026

Abstract

Advanced economies, including the United States, are undergoing a sustained demographic transition toward older populations, driven by declining fertility and increasing longevity. While existing research examines the macroeconomic implications of population aging and the fiscal impacts for higher level governments, less is known about how population aging affects local fiscal and economic outcomes. Using a demographic shift-share design that exploits pre-existing variation in age structures, this paper analyzes the causal impact of changes in the elderly population share on economic and fiscal outcomes across commuting zones between 2010-2022, a period that spans the retirement of the Baby Boom generation. Consistent with increased consumption demand from retirees, the results show that the aging of the Baby Boomers had little effect on local economic output or the size of government, but led to higher house prices and population growth, suggesting that local demand-side effects offset reductions in labor supply.

JEL codes: J1, R1, H7

Keywords: population aging, regional economics, housing markets, local public finance, shift-share

*St.Clair: Robert F. Wagner School of Public Service, New York University (NYU), 105 East 17th St, 3rd Floor, New York, NY, 10003 (e-mail: travis.stclair@nyu.edu). For helpful comments, I am grateful to Jonathan Morduch, Ingrid Ellen, Eric Brunner, Michah Rothbart and seminar and conference participants at New York University, ABFM, and the Public Finance and Budgeting Northeast Workshop.

1 Introduction

Advanced economies, including the United States, are undergoing a sustained demographic transition toward older populations, driven by declining fertility and increasing longevity. Between 1920 and 2020, the percentage of the population 65 years and over in the United States increased from 5% to nearly 17%, a rate of growth nearly five times that of the total population (Caplan, 2023). The decade preceding 2020 saw the largest ever percentage-point increase on record, with the elderly share rising from 13% to 17% of the population (Caplan, 2023). Much of this recent growth reflects the aging of the Baby Boom generation, the large cohort born in the post-war period between 1946 and 1964 who began reaching retirement age in 2011. While the United States has experienced a particularly rapid increase in its elderly population in recent decades, it is part of a broader demographic trend affecting advanced economies worldwide. Many high-income countries, including Japan, Canada, and numerous European nations, have even larger shares of older residents, underscoring the global scope of the demographic transition (Caplan, 2023).

The aging of the population will have significant fiscal and macroeconomic implications, and consequently has been a frequent topic of study by economists, who have probed its impact on economic growth (Maestas et al., 2023; Acemoglu and Restrepo, 2017; Prettner, 2013), productivity (Feyrer, 2007; Burtless, 2013), the labor force (Manton et al., 2007), taxation (Ferraro and Fiori, 2020), and deficits (Lee and Skinner, 1999; Sheiner, 2021), among other topics. Aging is expected to slow economic growth and productivity growth and place significant pressure on the U.S. federal budget. However, despite the breadth of this literature, the consequences of population aging for local economic and fiscal outcomes remain largely unexplored. The local perspective is important for two reasons. First, many of the channels through which aging affects economic outcomes are inherently local, including housing market dynamics, migration patterns, the political economy of school spending, and demand for public services. Second, local variation offers important methodological

advantages. Differences in the pace and timing of aging across communities generate substantially more variation in treatment exposure than is available in national or state-level analyses, allowing for more precise estimation, a richer examination of heterogeneity, and the identification of effects that may be obscured in more aggregated data.

This paper uses a demographic shift-share design to examine the causal impact of population aging on a range of fiscal and economic outcomes. To isolate plausibly exogenous differences in local exposure to aging, the shift-share design exploits pre-existing variation in baseline age structures across commuting zones, following an approach similar to those used by Maestas et al. (2023) and Butler and Yi (2022). Commuting zones with larger initial shares of Baby Boom cohorts experience larger subsequent increases in their elderly population as these cohorts reach age 65, generating variation in population aging that is attributable to predetermined demographic composition rather than contemporaneous local economic conditions. By leveraging this source of variation, the analysis identifies the local consequences of aging while abstracting from national demographic trends and other aggregate forces that affect all commuting zones simultaneously. The study period spans 2010 to 2022, encompassing the retirement of the Baby Boom generation and one of the most significant demographic transitions in modern U.S. history. This setting provides a unique opportunity to examine how local economies and governments adjust to a sustained increase in the share of older residents.

The results suggest that population aging had little effect on the total extent of local economic activity but significantly altered local demographic and housing market outcomes. A one-percentage-point increase in the share of residents aged 65 and older led to approximately a two percent increase in total population and a six percent increase in home values. Despite concerns that aging may reduce labor supply and slow economic growth, the analysis finds no statistically significant effects on per capita GDP or total employment. These findings suggest that increased consumption demand from older residents, together with migration responses, may offset the adverse effects of a shrinking workforce. The analysis

likewise finds no meaningful effect on the overall size of local government, as measured by outcomes aggregated across all governments within a commuting zone, including municipalities and school districts. However, there are important sources of heterogeneity; in states that offer property tax relief to seniors, population aging actually led to an increase in total employment and an expansion of government. The results are robust to a series of robustness and falsification tests based on best practices from the recent shift-share literature (Adao et al., 2019; Borusyak et al., 2022, 2025; Goldsmith-Pinkham et al., 2020).

The results contribute, first and foremost, to the literature on the economics of population aging. Prior research has examined how demographic aging affects economic growth, labor markets, and productivity (Acemoglu and Restrepo, 2017; Bloom et al., 2010), but relatively little is known about how these effects manifest at the local level. The limited subnational evidence that does exist has focused primarily on states (e.g., Maestas et al. (2023)), an important unit of analysis but one that may obscure substantial variation across local communities. This paper instead examines variation at the commuting zone-level, where many of the economic and demographic consequences of aging—including changes in housing demand, migration patterns, and local service needs—are more likely to be observed. While prior studies have largely focused on the implications of aging for federal and state budgets (Butler and Yi, 2022; Felix and Watkins, 2013; Sheiner, 2021), this study considers local governments, which provide many of the public services most directly affected by demographic change. The results also capture a more recent phase of population aging than prior studies, providing evidence from a period of unusually rapid growth in the elderly population.

The paper also contributes to the literature on local and regional adjustment to aggregate shocks and the resulting implications for place-based economic divergence. Over the past several decades, economists have exploited local variation in exposure to a variety of economic shocks, including the decline in manufacturing employment (Autor et al., 2013), migration flows (Diamond, 2016), and the Great Recession (Yagan, 2019). This research

demonstrates that local economies often adjust unevenly to common national forces, generating persistent differences across places. A recurring theme in this literature is the central role of housing markets in mediating local adjustment and shaping spatial patterns of economic growth and decline (Charles et al., 2016; Ganong and Shoag, 2017). Population aging represents another important source of local economic change, yet comparatively little is known about how communities adjust to this demographic shock. Thus, this paper extends the literature on local adjustment to a previously understudied but increasingly important source of regional change.

This paper proceeds as follows. Section 2 presents a simple conceptual framework for understanding the effect of population aging on local economies. Section 3 presents the data. Section 4 outlines the shift-share design, while section 5 presents the results as well as the findings from a series of robustness checks. Section 6 concludes.

2 Conceptual Framework

Consider a commuting zone-level production function:

$$Y_i = A_i F(L_i, K_i) \tag{1}$$

where Y_i denotes GDP, A_i productivity, K_i capital, and L_i labor input. Labor input depends on the age structure of the population – summarized here by the elderly share of the population – and migration flows:

$$L_i = L_i(E_i, M_i)$$

where E_i denotes the elderly share of the population and M_i denotes net migration.

Capital accumulation depends on migration flows and local demand generated by retirees:

$$K_i = K_i(M_i, D_i)$$

where D_i represents retiree-generated demand. Because retirees bring income from Social Security, pensions, and accumulated assets that may be spent locally on goods and services, retiree-generated demand can be written as:

$$D_i = D(E_i).$$

Migration flows themselves may also respond to population aging, so

$$M_i = M_i(E_i).$$

These relationships imply the following comparative statics. Aging is expected to reduce labor supply directly because a larger elderly share reflects a larger retired population:

$$\frac{\partial L_i}{\partial E_i} < 0.$$

Retiree-generated demand is expected to increase with population aging:

$$\frac{\partial D_i}{\partial E_i} > 0.$$

Migration may increase labor input as workers move into aging communities to provide healthcare, retail, and other locally consumed services.

$$\frac{\partial L_i}{\partial M_i} > 0.$$

Higher retiree demand may induce additional investment in housing, healthcare facilities, retail establishments, and other local capital:

$$\frac{\partial K_i}{\partial D_i} > 0$$

while migration also may increase capital accumulation through additional residential and commercial investment:

$$\frac{\partial K_i}{\partial M_i} > 0.$$

Taking the derivative of output with respect to the elderly share yields:

$$\frac{\partial Y_i}{\partial E_i} = \frac{\partial Y_i}{\partial L_i}\left(\frac{\partial L_i}{\partial E_i} + \frac{\partial L_i}{\partial M_i}\frac{\partial M_i}{\partial E_i}\right) + \frac{\partial Y_i}{\partial K_i}\left(\frac{\partial K_i}{\partial D_i}\frac{\partial D_i}{\partial E_i} + \frac{\partial K_i}{\partial M_i}\frac{\partial M_i}{\partial E_i}\right) \tag{2}$$

Collecting terms yields the following decomposition:

$$\frac{\partial Y_i}{\partial E_i} = \underbrace{\frac{\partial Y_i}{\partial L_i}\frac{\partial L_i}{\partial E_i}}_{\text{Direct labor supply effect}} + \underbrace{\frac{\partial Y_i}{\partial K_i}\frac{\partial K_i}{\partial D_i}\frac{\partial D_i}{\partial E_i}}_{\text{Retiree demand effect}} + \underbrace{(\frac{\partial Y_i}{\partial L_i}\frac{\partial L_i}{\partial M_i} + \frac{\partial Y_i}{\partial K_i}\frac{\partial K_i}{\partial M_i})\frac{\partial M_i}{\partial E_i}}_{\text{Migration-mediated adjustment}} \tag{3}$$

This expression highlights three channels through which population aging may affect local output. The first captures the direct reduction in labor input as workers retire. The second reflects the increase in local demand generated by retirees and the resulting investment in local capital. The third captures migration-induced adjustments in labor and capital. The labor-supply channel is expected to reduce output, while the retiree-demand channel is expected to increase output. The migration-mediated adjustment is theoretically ambiguous and depends on the extent to which workers and capital flow toward, or away from, aging communities.

3 Data

To identify the effects of population aging, this paper draws on data from a variety of

sources. For many variables, the analysis aggregates county-level data to the commuting zone-level based on the 2010 commuting zone definitions from Fowler et al. (2016). Detailed population data by age group come from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program. The SEER data begin in 1969 and provide population estimates at the age-county-year level. County-level GDP data come from the Bureau of Economic Analysis (BEA). Employment data come from the Quarterly Census of Employment and Wages (QCEW), administered by the Bureau of Labor Statistics (BLS). QCEW employment data include payroll positions but exclude the self-employed and most agricultural workers. House price data come from the Federal Housing Finance Agency's (FHFA) annual county all-transactions House Price Index (HPI). The index measures changes in single-family house prices using a weighted repeat-sales methodology that compares successive valuations of the same properties, thereby controlling for changes in the composition and quality of the housing stock. The index incorporates both sales prices and appraisal values associated with mortgages purchased or securitized by Fannie Mae and Freddie Mac. To construct commuting-zone measures of home values, the analysis calculates a weighted average of the index across counties, using the number of housing units in 2010 as weights.

Fiscal outcomes come from the Census of Governments (COG) and the Annual Survey of State and Local Government Finances. The U.S. Census Bureau conducts a complete census of the nation's state and local governments every five years (years ending in 2 and 7). In the intervening years, it collects data on a stratified sample, with larger governments appearing in the data every year. To construct commuting zone-level measures of local government revenues and expenditures, the analysis uses linear interpolation to estimate missing observations for governments not surveyed in a given year and then aggregates revenues and expenditures across all local government entities within each county. Because all large municipal government and school districts are sampled every year, this results in fairly minor adjustments to the aggregated raw data. The analysis then aggregates the

county-level measures to commuting zones.

Table 1 presents summary statistics. Panel A presents summary statistics for the demographic variables. Over the sample period (2010-2022), across commuting zones the percentage of the population that was 65 years of age or older was 17.5 percentage on average, with the percentage increasing 0.4 percentage points per year. Figure 1 displays the commuting zone-level share of the population aged 65 and older in 2010 and 2022. Two patterns are immediately apparent. First, the elderly share increased substantially throughout the United States, as evidenced by the shift toward darker shading in the 2022 map. Second, the increase was not geographically uniform. The increase was particularly pronounced across commuting zones in the Great Plains, Mountain West, Upper Midwest, Appalachia, and northern New England, while many commuting zones centered on major metropolitan areas experienced comparatively smaller increases and remained relatively younger. These patterns highlight substantial spatial variation in the pace of population aging across local communities.

Panels B-D in Table 1 present summary statistics for the economic and fiscal variables. The average commuting zone had a per capita GDP of $54,108 (in 2021 dollars) over the sample period. State revenues made up 30 percent of total revenues on average, while own-source revenues made up approximately 63 percent, with property taxes contributing the largest share. Expenditures were concentrated in education (38 percent of total spending).

4 Methods

To identify the causal effects of population aging, this paper exploits variation across commuting zones in the age distribution from prior decades. This approach is similar to those employed by Maestas et al. (2023) and Butler and Yi (2022), who exploit state-level variation in age distributions and fertility rates, respectively. The intuition is straightforward: commuting zones with a larger share of Baby Boomers in 1990 experienced larger increases

in the elderly population share as those cohorts reached age 65. The resulting estimates capture the effect of aging induced by pre-existing demographic composition, including local adjustment mechanisms, such as migration, housing market responses, and changes in service demand. Because identification comes from variation across commuting zones within a common national demographic environment, the estimates do not capture aggregate effects of aging that operate nationally, such as economy-wide changes in productivity or labor force participation.

To construct the instrument, I first calculate the share of each birth cohort in each commuting zone in a baseline year (1990). For each birth cohort b in year t, I then compute a national cohort growth factor:

$$Growth_{b,t} = \frac{CohortPop_{b,t}}{CohortPop_{b,t_0}}$$

where t_0 denotes the baseline year. These growth factors capture the national evolution of each birth cohort over time.

I then predict the elderly population share in each commuting zone-year by applying the national cohort growth factors to the commuting zone's baseline age distribution. Intuitively, this procedure asks: given a commuting zone's initial age structure, what would its elderly population share look like if each cohort evolved in the same way as it did nationally?

The resulting predicted elderly share is:

$$PredictedElderlyShare_{it} = \frac{\sum_{b:t-b\geq 65} Share_{i,b,1990} x Growth_{b,t}}{\sum_{b} Share_{i,b,1990} x Growth_{b,t}}$$

This instrument has a shift-share structure, where the baseline cohort shares constitute the exposure shares and the national cohort growth factors constitute the shifts. A growing literature has established conditions under which shift-share instruments yield valid inference and proposed diagnostic tests for evaluating their validity (Goldsmith-Pinkham et al., 2020; Borusyak et al., 2022, 2025; Adao et al., 2019). In this setting, identification relies on

the exogeneity of the national cohort shocks, conditional on the controls included in the specification. The baseline age distribution of a commuting zone is likely to be endogenous, as demographic composition reflects historical migration, fertility, and economic conditions. The identification assumption then is that the national cohort evolution is orthogonal to county-specific economic and fiscal conditions. Section 4.1 presents a series of balance and falsification tests that assess this assumption.

The empirical analysis proceeds using two-stage least squares. In the first stage, the observed elderly population share is regressed on the predicted elderly share:

$$ElderlyShare_{i,t} = \pi PredictedElderlyShare_{it} + X'_{it}\gamma + \mu_i + \lambda_t + \xi_{i,t} \tag{4}$$

where X_{it} denotes time-varying controls, μ_i are commuting zone fixed effects, and λ_t are year fixed effects. The second-stage equation is

$$Y_{it} = \beta \widehat{ElderlyShare}_{it} + X'_{it}\delta + \nu_i + \rho_t + \varepsilon_{it} \tag{5}$$

where $\hat{ElderlyShare}_{it}$ is instrumented using $PredictedElderlyShare_{it}$.

One important consideration concerns the choice of time-varying controls. Borusyak et al. (2025) note that, even when identification derives from the shifts, researchers may be concerned that some variation attributed to the shocks actually reflects differences in exposure patterns across units. Measuring exposure shares further in the past helps mitigate this concern by reducing the scope for endogenous sorting, although doing so may weaken the first stage (Maestas et al., 2023). To address this issue, the baseline specification controls for a low-dimensional summary of the baseline age distribution interacted with year fixed effects. Specifically, the controls include the shares of the population that are under age 18, ages 18–44, ages 45–64, and age 65 or older, each of which is interacted with year fixed effects. These controls flexible account for demographic confounding associated with initial age composition. In a separate test, I evaluate whether the results are robust to alternative

choices for the baseline year used to construct the instrument.

The regressions are estimated at the commuting zone-by-year level, and consequently the baseline analysis clusters the standard errors by commuting zone. A recent econometric literature suggests that conventional clustering may understate sampling uncertainty. Adao et al. (2019) show that conventional geographic standard errors can perform poorly in shift-share designs because regions with similar exposure shares are exposed to the same national cohort shocks regardless of geographic proximity. Borusyak et al. (2022) provide a complementary framework for "identification by shifts." The key insight is that a conventional location-level shift-share IV regression can be represented as an equivalent regression at the shock-level, which provides a convenient basis for inference. One complication with the current application is that the instrument is a non-linear ratio. However, it is possible to use a Taylor approximation to linearize the instrument. In the baseline specifications, I continue to report conventional standard errors clustered at the commuting zone level. However, in a robustness table, I report "exposure-robust" standard errors from an equivalent Taylor shock-level regression that are clustered by birth cohort.

4.1 Balance Tests

When applying shift-share designs with many exogenous shifts, Borusyak et al. (2025) recommend conducting balance tests for both the shifts and the shift-share instrument. These tests assess whether the variation used for identification is systematically related to observable characteristics that may proxy for omitted confounders. Table A1 presents balance tests for the shifts. Specifically, the table reports cross-sectional OLS regressions of the percentage change in national cohort size between 2010 and 2022 on a set of demographic characteristics, estimated at the birth-cohort level. The sample is restricted to cohorts born before 1985 and after 1950 (between 25 and 60 in 2010). Because national cohort growth is strongly related to cohort age, all specifications flexibly control for birth year by including quadratic terms in birth year and interactions between the birth year polynomials and five-

year birth-cohort fixed effects. This allows the relationship between cohort growth and birth year to vary flexibly across portions of the birth-year distribution, effectively comparing cohorts with similar ages while absorbing broad generational trends. In addition, I include an indicator for cohorts born in years ending in 0 or 5 to account for small discontinuities consistent with age-reporting heaping. The results indicate little systematic relationship between cohort growth and cohort characteristics once age is accounted for. Of the seven covariates examined, none are statistically significant.

Table A2 presents balance tests for the shift-share instrument. The table reports cross-sectional OLS regressions of the change in the predicted elderly share between 2010 and 2022 on pre-period changes in commuting zone characteristics measured between 2000 and 2010. These regressions assess whether commuting zones with greater predicted exposure to population aging were already on different trajectories prior to the retirement of the Baby Boom generation. All specifications include state fixed effects and 1990 population shares in four age groups – under 18, 18-44, 45-64, and 65 or older.[1] None of the specifications yield a statistically significant coefficient on the predicted elderly share.

5 Results

5.1 Economic Outcomes

Table A3 present the first-stage results. The coefficient on elderly share is highly significant, and the regression has an F-stat of 100, validating the strength of the instrument. Panel A in Table 2 shows the results for the economic outcomes. Population aging as measured by the share of the population that is 65-plus has no measurable impact on GDP per capita or total employment. However, it does increase home prices and the size of the population. A one percentage point increase in the elderly population share increases home

[1] In this and subsequent cross-sectional regressions, commuting zones that span multiple states are assigned to the state containing the largest share of their counties for purposes of the state fixed effects.

prices by 5.9 percent and the population by 1.9 percent. As noted above, the local average treatment effect captures the effect of aging induced by the pre-existing age structure. It excludes the aggregate effects of aging that operate nationally, such as a nation-wide slowdown in productivity.

Section 2 outlines three channels through which aging can effect the local economy: labor supply, consumption demand from retirees, and migration-mediated adjustments. The housing and population results in Table 2 are consistent with the consumption effect of retirees and corresponding in-migration. The GDP results suggest that these factors offset the labor supply reduction.

The GDP results are somewhat at odds with the findings of Maestas et al. (2023), who exploit state-level variation in aging (as measured by the 60+ population) and find that population aging reduced the growth rate in GDP per capita. Several differences in sample and methodology may explain this discrepancy. First, this paper utilizes variation at the level of commuting zones, where migration is more elastic. Second, the time periods of study are different; whereas Maestas et al. (2023) study 1980-2010, this paper looks at the retirement of the Baby Boomers over 2010-2022.

A numbers of papers have looked at the effect of aging on the housing market, with some finding positive effects on prices (Hiller and Lerbs, 2016) and others negative (Banzhaf et al., 2021). However, as Green and Lee (2016) point out, there is no single aging effect, and cohort effects can offset lifecycle effects. The Baby Boomer cohort is wealthier and more educated than earlier cohorts (Frey, 2026; Lusardi and Mitchell, 2007) and thus may consume more housing than earlier cohorts at the same age. This wealth effect may explain the increase in housing prices visible in Table 2 as well as the in-migration to meet consumption demand.

5.2 Fiscal Outcomes

Panels B and C in Table 2 report the results for log per capita government revenues and expenditures, respectively. As noted above, these outcomes are constructed by, first,

aggregating the finances of all local government entities within a county, including county governments, municipalities, special districts, and school districts, and then aggregating across counties to the commuting zone-level. Population aging has no statistically significant effect on total per capita revenues. There is however some evidence of compositional changes. There is a marginally significant ($p<0.10$) decrease in property taxes per capita, and a slight increase in per capita revenues from charges and fees. At first glance, the negative effect on property tax revenues may appear inconsistent with the positive effect on house prices reported above. However, the widespread availability of property tax relief programs for older homeowners weakens the link between rising property values and property tax collections (Banzhaf et al., 2021).

Population aging likewise has no statistically significant effect on total log per capita expenditures. The only discernible expenditure response is a modest increase in expenditures on utilities. Despite prior research suggesting that jurisdictions with larger elderly populations devote fewer resources to K–12 education (Poterba, 1997), the estimates provide no evidence that population aging reduces education spending. More broadly, the absence of meaningful effects on either revenues or expenditures suggests that population aging need not substantially alter the overall size of local government. This finding is consistent with the results above showing little effect on per capita GDP or local employment, implying that the economic base supporting local public finances remained largely unchanged as populations aged during this period.

These results also differ somewhat from the existing literature. Butler and Yi (2022), for example, find that population aging increases municipal bond spreads, in part by reducing state personal income tax revenues. The difference may again reflect differences in both the sample period and the level of aggregation. Butler and Yi (2022) focus on state government finances between 1996 and 2016, whereas the analysis here examines commuting zones during the period in which the Baby Boom generation entered retirement. The more limited fiscal effects documented here may therefore reflect both differences between state

and local economies and the relatively greater wealth of Baby Boomer retirees.

5.3 Heterogeneity

Table 3 explores heterogeneity across two dimensions. First, it looks at how the effects of population aging may differ across urban and rural commuting zones. Urban commuting zones are those with at least 50 percent of the population living in census-designated urban areas in 2020. There are several reasons why aging might have different effects in urban as opposed to rural areas. Migration responses may be stronger in urban areas, which generaly have larger labor markets, more diversified economies, and a more elastic labor supply. Retiree demand may also generate larger local multipliers in urban areas, as these areas have large service sectors that can be expanded relatively easily. On the other hand, rural areas often have more elastic housing supply. The table shows that the effects of aging are fairly consistent across urban and rural areas, with only small differences in the effects on housing and population.

Another potential source of heterogeneity is the extent to which governments grant property tax relief to seniors. Without such relief, one would expect the house price effects documented above to show up in property tax revenue. Accordingly, I divide the sample into commuting zones with "high property tax relief" and those with "low property tax relief." Those with "higher property tax relief" are in states with statewide senior property tax freeze or assessment freeze programs (National Conference of State Legislatures, 2025). In this case, there are some notable differences. Commuting zones in states with high property tax relief see increases in total employment and total population, larger increases in home values, and higher government spending following increases in population aging. In contrast, those in states with low property tax relief experience a decrease in GDP per capita and smaller increase in home values and population. Taken together, these results are consistent with property tax relief reinforcing the local demand effects of population aging. By insulating older homeowners from increases in property tax liabilities as home values rise, these policies

may help sustain housing demand and population growth as communities age.

5.4 Robustness

In addition to the balance tests presented in section 4.1, I also present the results of several other robustness tests that explore the validity of the shift-share design and its sensivitity to alternative assumptions. Table A4 presents the results from falsification tests that explore the effect of population aging during the sample period on pre-period outcomes. Specifically, it presents the results of cross-sectional 2SLS regressions of the change in outcomes over the decade preceding 2010 on the change in the elderly share between 2010-2022. All of the specifications include state fixed effects and the 1990 population shares of four different age groups. None of the coefficients are statistically significant.

Table A5 presents the results from a long-difference specification, with the analysis similar to the baseline analysis presented above but with the differences estimated cross-sectionally. Long-difference specifications emphasize low-frequency variation in aging and outcomes, reducing sensitivity to short-run fluctuations and measurement error and providing a complementaty check on the panel specifications above. The results are very similar to the main estimates.

Finally, Table A6 explores the sensivitity of the results to alternative specification choices. Panel A uses 1995 as the baseline year instead of 1990. Measuring exposure shares further from the present may weaken the first stage but also lowers the possibility of endogenous sorting. The results are very similar to the main results. Panel B reports the results of an alternative inference procedure based on Borusyak et al. (2022). Specifically, the shift-share instrument is linearized using a Taylor approximation, then converted to a shock-level regression. The standard errors are computed from the shock-level regression and clustered by birth cohort. Due to the linearization, the coefficients are very similar but not exactly identical to the main coefficients. The table shows that the standard errors are smaller than the baseline results, affirming the main findings. In fact, the results for government revenues

and expenditures per capita are now significant, reinforcing the notion that aging may not necessarily result in a reduction in the size of government.

6 Conclusion

Population aging represents a significant public policy challenge for advanced economies, raising concerns about the sustainability of healthcare systems, pension finances, and labor force participation. This paper examines the effect of population aging on fiscal and economic outcomes, focusing on a period of time corresponding to the retirement of the Baby Boomers. Unlike previous work on population aging, the focus is specifically on local outcomes. The analysis uses a demographic shift-share approach, abstracting from nationwide effects and isolating regional variation.

The effects show that the aging of the Baby Boomers led to higher house prices and in-migration to areas with greater aging populations, consistent with the retirement consumption of the wealthiest cohort of retirees in history. There was no effect on per capita GDP or per capita government spending in the baseline specifications, suggesting that population aging will not necessarily lead to decreases in economic output or the size of government. During this period, it appears that the consumption effect of retirees and the corresponding in-migration offset the effects on labor force participation. In states offering significant property tax relief to seniors, there were also positive effects on total employment and government expenditures, suggesting that property tax relief may reinforce the local consumption demand effect of population aging.

These findings stand in contrast to some previous findings in the literature based on state-level variation and earlier time periods that have suggested that population aging leads to decreased economic output and reductions in the size of government (Maestas et al., 2023; Butler and Yi, 2022). Insofar as these findings reflect the increased wealth and education of the Baby Boomer cohort, they suggest that the economic consequences of population aging

may not be as damaging as feared and are consistent with cross-country evidence emphasizing the association between aging and the rapid adoption of new technologies (Acemoglu and Restrepo, 2017). More broadly, the findings suggest that the economic consequences of aging may depend on the composition of the cohorts entering retirement, including their wealth, education, and consumption patterns.

References

Daron Acemoglu and Pascual Restrepo. Secular stagnation? the effect of aging on economic growth in the age of automation. *American Economic Review*, 107(5):174–179, 2017.

Rodrigo Adao, Michal Kolesár, and Eduardo Morales. Shift-share designs: Theory and inference. *The Quarterly Journal of Economics*, 134(4):1949–2010, 2019.

David H Autor, David Dorn, and Gordon H Hanson. The china syndrome: Local labor market effects of import competition in the united states. *American economic review*, 103(6):2121–2168, 2013.

H. Spencer Banzhaf, Ryan Mickey, and Carlianne Patrick. Age-based property tax exemptions. *Journal of Urban Economics*, 121:103303, 2021. ISSN 0094-1190. doi: https://doi.org/10.1016/j.jue.2020.103303. URL https://www.sciencedirect.com/science/article/pii/S0094119020300747.

David E Bloom, David Canning, Günther Fink, et al. Population aging and economic growth. *Globalization and Growth*, pages 297–328, 2010.

Kirill Borusyak, Peter Hull, and Xavier Jaravel. Quasi-experimental shift-share research designs. *The Review of economic studies*, 89(1):181–213, 2022.

Kirill Borusyak, Peter Hull, and Xavier Jaravel. A practical guide to shift-share instruments. *Journal of Economic Perspectives*, 39(1):181–204, 2025.

Gary Burtless. The impact of population aging and delayed retirement on workforce productivity. *Available at SSRN 2275023*, 2013.

Alexander W. Butler and Hanyi Yi. Aging and public financing costs: Evidence from u.s. municipal bond markets. *Journal of Public Economics*, 211:104665, 2022. ISSN 0047-2727. doi: https://doi.org/10.1016/j.jpubeco.2022.104665. URL https://www.sciencedirect.com/science/article/pii/S0047272722000676.

Zoe Caplan. 2020 census: 1 in 6 people in the united states were 65 and over, May 2023. URL https://www.census.gov/library/stories/2023/05/2020-census-united-states-older-population-grew.html.

Kerwin Kofi Charles, Erik Hurst, and Matthew J Notowidigdo. The masking of the decline in manufacturing employment by the housing bubble. *Journal of Economic Perspectives*, 30(2):179–200, 2016.

Rebecca Diamond. The determinants and welfare implications of us workers' diverging location choices by skill: 1980–2000. *American economic review*, 106(3):479–524, 2016.

Alison Felix and Kate Watkins. The impact of an aging us population on state tax revenues. *Economic Review*, 4:95–127, 2013.

Domenico Ferraro and Giuseppe Fiori. The aging of the baby boomers: Demographics and propagation of tax shocks. *American Economic Journal: Macroeconomics*, 12(2): 167–193, 2020.

James Feyrer. Demographics and productivity. *The Review of Economics and Statistics*, 89 (1):100–109, 02 2007. ISSN 0034-6535. doi: 10.1162/rest.89.1.100. URL https://doi.org/10.1162/rest.89.1.100.

Christopher S. Fowler, Danielle C. Rhubart, and Leif Jensen. Reassessing and revising commuting zones for 2010: History, assessment, and updates for U.S. "labor-sheds" 1990–2010. *Population Research and Policy Review*, 35(2):263–286, 2016. doi: 10.1007/s11113-016-9386-0.

William H. Frey. Baby boomers are turning 80: A closer look at the generation that reshaped america. Brookings Institution, January 2026. URL https://www.brookings.edu/articles/baby-boomers-are-turning-80/. Accessed July 1, 2026.

Peter Ganong and Daniel Shoag. Why has regional income convergence in the us declined? *Journal of Urban Economics*, 102:76–90, 2017.

Paul Goldsmith-Pinkham, Isaac Sorkin, and Henry Swift. Bartik instruments: What, when, why, and how. *American Economic Review*, 110(8):2586–2624, 2020.

Richard K. Green and Hyojung Lee. Age, demographics, and the demand for housing, revisited. *Regional Science and Urban Economics*, 61:86–98, 2016. ISSN 0166-0462. doi: https://doi.org/10.1016/j.regsciurbeco.2016.09.005. URL https://www.sciencedirect.com/science/article/pii/S016604621630028X.

Norbert Hiller and Oliver W. Lerbs. Aging and urban house prices. *Regional Science and Urban Economics*, 60:276–291, 2016. ISSN 0166-0462. doi: https://doi.org/10.1016/j.regsciurbeco.2016.07.010. URL https://www.sciencedirect.com/science/article/pii/S0166046216301107.

Ronald Lee and Jonathan Skinner. Will aging baby boomers bust the federal budget? *Journal of Economic Perspectives*, 13(1):117–140, 1999.

Annamaria Lusardi and Olivia S Mitchell. Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth. *Journal of monetary Economics*, 54(1): 205–224, 2007.

Nicole Maestas, Kathleen J Mullen, and David Powell. The effect of population aging on economic growth, the labor force, and productivity. *American Economic Journal: Macroeconomics*, 15(2):306–332, 2023.

Kenneth G Manton, Gene R Lowrimore, Arthur D Ullian, XiLiang Gu, and H Dennis Tolley. Labor force participation and human capital increases in an aging population and implications for us research investment. *Proceedings of the National Academy of Sciences*, 104(26):10802–10807, 2007.

National Conference of State Legislatures. State property tax freeze and assessment freeze programs. https://www.ncsl.org/elections-and-campaigns/state-property-tax-freeze-and-assessment-freeze-programs, 2025. Accessed May 26, 2026.

James M Poterba. Demographic structure and the political economy of public education. *Journal of Policy Analysis and Management*, 16(1):48–66, 1997.

Klaus Prettner. Population aging and endogenous economic growth. *Journal of population economics*, 26(2):811–834, 2013.

Louise Sheiner. The long-term impact of aging on the federal budget. In *Fiscal Accountability and Population Aging*, pages 93–117. Edward Elgar Publishing, 2021.

Danny Yagan. Employment hysteresis from the great recession. *Journal of Political Economy*, 127(5):2505–2558, 2019.

Table 1: Summary Statistics, 2010-2022

	(1)	(2)
Panel A: Demographic Variables	**Mean**	**SD**
% Elderly (65+)	17.5	4.4
Annual Change in % Elderly	0.4	0.2
Panel B: Economic Outcomes	**Mean**	**SD**
GDP Per Capita	54,108	24,098
Total Employment	218,912	562,380
House Price Index	361	222
Total Population	516,933	1,282,230
Panel C: Government Revenues	**Per-Capita Mean**	**% of Total**
Total Revenue	6,174	100
Own-Source Revenue	3,886	63
Property Tax	1,426	23
Charges & Misc Rev	1,423	23
Intergovernmental Revenue		
IG Revenue - State	1,881	30
IG Revenue - Fed	247	4
Panel D: Government Expenditures	**Per-Capita Mean**	**% of Total**
Total Expenditure	6,283	100
Education	2,367	38
Health & Hospitals	725	12
Utilities	615	10
Police & Fire	375	6

Note: All variables aggregated from county-level data to the commuting zone level based the commuting zone definitions in Fowler et al. (2016). Economic and fiscal variables in 2021 dollars. Fiscal data come from the Census of Governments. GDP data come from BEA. Employment data from the Quarterly Census of Employment and Wages (BLS). The house price index is from the Federal Housing Finance Agency (FHFA) and represents an average across counties weighted by the number of housing units in 2010. QCEW employment data includes payroll positions and excludes the self-employed and most agricultural workers. Population by age data from from the National Cancer Institute's SEER program.

Figure 1: Elderly Population Share by Commuting Zone

Figure 1a: 2010

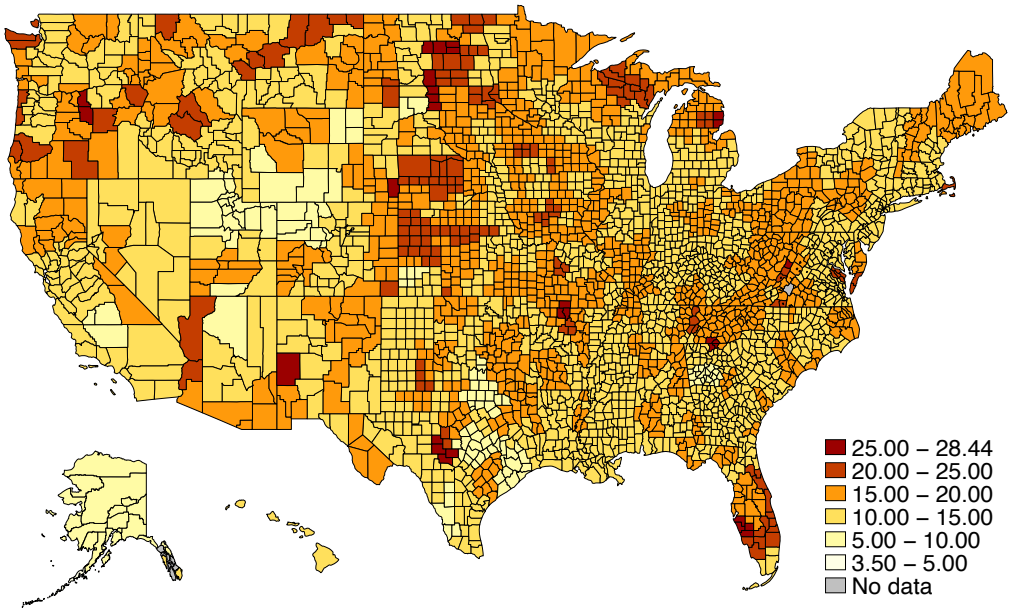


Figure 1b: 2022

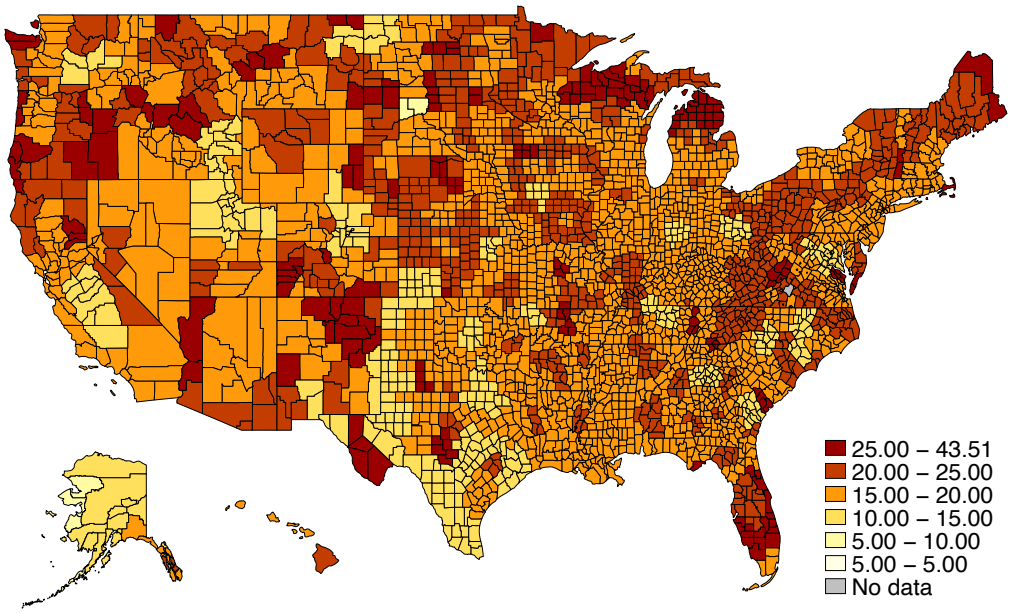


Table 2: The Effect of Population Aging, 2SLS Results

Panel A: Economic Outcomes

	(1) Log GDP Per Capita	(2) Log Employment	(3) Log House Price Index	(4) Log Population
% Elderly	-0.009	0.005	0.059***	0.019***
	(0.012)	(0.006)	(0.013)	(0.005)
N	8,047	8,009	6,144	8,047

Panel B: Government Revenues

	(1) Log Total Rev Per Cap	(2) Log Own-Source Rev Per Cap	(3) Log Property Tax Per Cap	(4) Log Charges & Misc Rev Per Cap	(5) Log State IG Rev Per Cap	(6) Log Federal IG Rev Per Cap
% Elderly	0.013	0.019	-0.029*	0.048**	0.004	-0.060
	(0.009)	(0.012)	(0.016)	(0.023)	(0.012)	(0.044)
N	7,968	7,968	7,968	7,968	7,968	7,968

Panel C: Government Expenditures

	(1) Log Total Expend Per Capita	(2) Log Education Per Capita	(3) Log Health & Hospitals Per Cap	(4) Log Utilities Per Capita	(5) Log Police & Fire Per Capita
% Elderly	0.011	0.016	0.028	0.061**	-0.012
	(0.009)	(0.013)	(0.060)	(0.024)	(0.013)
N	7,968	7,968	7,968	7,968	7,968

Note: ***p< 0.01. **p<0.05. *p<0.1. All dollar values measured in 2021 dollars. Robust standard errors clustered at the commuting zone level in parentheses. All regressions include commuting zone and year fixed effects, as well as 1990 population shares in four age groups – under 18, 18-44, 45-64, and 65 or older – each interacted with year fixed effects.

Table 3: Heterogeneity

	(1) Urban	(2) Rural	(3) High Prop Tax Relief	(4) Low Prop Tax Relief
	Panel A: Log GDP Per Capita			
% Elderly	-0.002	-0.012	0.044	-0.027**
	(0.011)	(0.020)	(0.034)	(0.011)
	Panel B: Log Employment			
% Elderly	0.002	0.002	0.042**	-0.006
	(0.009)	(0.008)	(0.017)	(0.008)
	Panel C: Log House Price Index			
% Elderly	0.056***	0.047***	0.084**	0.055***
	(0.019)	(0.014)	(0.039)	(0.014)
	Panel D: Log Population			
% Elderly	0.013**	0.019***	0.042***	0.015**
	(0.006)	(0.006)	(0.012)	(0.006)
	Panel E: Log Government Revenue Per Capita			
% Elderly	0.008	0.011	0.062***	0.002
	(0.010)	(0.013)	(0.021)	(0.011)
	Panel F: Log Government Expenditure Per Capita			
% Elderly	0.009	0.004	0.072***	-0.006
	(0.011)	(0.014)	(0.023)	(0.011)

Note: ***p< 0.01. **p<0.05. *p<0.1. Outcome variables measured in 2021 dollars. Robust standard errors clustered at the commuting zone level in parentheses. All regressions include commuting zone and year fixed effects, as well as 1990 population shares in four age groups – under 18, 18-44, 45-64, and 65 or older – each interacted with year fixed effects. Urban commuting zones are those with at least 50 percent of the population living in census-designated urban areas in 2010. Commuting zones providing "high property tax relief" are those in states with statewide senior property tax freeze or assessment freeze programs (National Conference of State Legislatures, 2025).

7 Appendices

Table A1: Balance Tests for the Shift

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Percentage Change in Cohort Size, 2010-2022						
Percent Male	-0.03						
	(0.35)						
Percent Non-Hispanic white		0.11					
		(0.21)					
Percent Non-Hispanic black			-0.46				
			(0.28)				
Percent Hispanic				0.07			
				(0.24)			
Percent Foreign-born					-0.15		
					(0.16)		
Percent Ever-married						-0.29	
						(0.31)	
Percent BA or higher							-0.09
							(0.18)
N	36	36	36	36	36	36	36

Note: This table presents the results of cross-sectional OLS regressions estimated at the cohort (birth-year) level for cohorts born between 1950 and 1985. All specifications include quadratic terms in birth year, interactions between the quadratic terms and five-year birth-cohort fixed effects, and indicators for cohorts born in years ending in 0 or 5. All demographic covariates come from the 2010 ACS. Robust standard errors in parentheses.

Table A2: Balance Tests for the Instrument

	(1)	(2)	(3)	(4)	(5)	(6)
	$\Delta PredictedElderlyShare$ (2010-2022)					
ΔLog GDP Per Capita (2001-2010)	-0.18					
	(0.41)					
ΔLog Employment (2000-2010)		-0.45				
		(0.66)				
ΔHouse Price Index (2000-2010)			0.76			
			(0.83)			
ΔLog Population (2000-2010)				1.3		
				(0.91)		
ΔLog Gov Revenue Per Capita (2000-2010)					-0.002	
					(0.42)	
ΔLog Gov Expenditures Per Capita (2000-2010)						0.25
						(0.44)
N	619	615	347	619	611	611

Note: This table presents the results of cross-sectional OLS regressions estimated at the commuting zone-level. Outcome variables measured in 2021 dollars. All regressions include state fixed effects and 1990 population shares in four age groups – under 18, 18-44, 45-64, and 65 or older. Robust standard errors in parentheses.

Table A3: First Stage

	(1) % Elderly
Predicted % Elderly	0.486***
	(0.051)
F-Stat	100
N	8,047

Note: ***p< 0.01. **p<0.05. *p<0.1. This table presents the first-stage results of the 2SLS regression of per capita GDP on elderly share. Robust standard errors clustered at the commuting zone level in parentheses. The specification includes commuting zone and year fixed effects, as well as 1990 population shares in four age groups – under 18, 18-44, 45-64, and 65 or older – each interacted with year fixed effects.

Table A4: Falsification Tests

	(1) ΔLog GDP Per Capita (2001-2010)	(2) ΔLog Employment (2000-2010)	(3) ΔLog House Price Index (2000-2010)	(4) ΔLog Population (2000-2010)	(5) ΔLog Revenue Per Capita (2000-2010)	(6) ΔLog Expenditure Per Capita (2000-2010)
$\Delta\%Elderly$	-0.006	0.005	0.008	0.010	-0.000	0.007
(2010-2022)	(0.012)	(0.007)	(0.008)	(0.006)	(0.010)	(0.012)
N	619	615	347	619	611	611

Note: This table presents the results of cross-sectional 2SLS regressions estimated at the commuting zone-level. Outcome variables measured in 2021 dollars. All regressions include state fixed effects and 1990 population shares in four age groups – under 18, 18-44, 45-64, and 65 or older. Robust standard errors in parentheses.

Table A5: Long-Difference (2010-2022)

	(1) ΔLog GDP Per Capita	(2) ΔLog Employment	(3) ΔLog House Price Index	(4) ΔLog Population	(5) ΔLog Revenue Per Capita	(6) ΔLog Expenditures Per Capita
Δ% Elderly	-0.004	0.009	0.047***	0.018***	0.014	0.010
	(0.013)	(0.007)	(0.012)	(0.005)	(0.009)	(0.010)
N	619	613	465	619	611	611

Note: ***p< 0.01. **p<0.05. *p<0.1. The table presents results from cross-sectional 2SLS regressions estimated at the commuting zone level, with all variables differenced over 2010-2022. Outcome variables measured in 2021 dollars. Robust standard errors in parentheses. All regressions include 1990 population shares in four age groups – under 18, 18-44, 45-64, and 65 or older.

Table A6: Robustness

	(1) Log GDP Per Capita	(2) Log Employment	(3) Log House Price Index	(4) Log Population	(5) Log Revenue Per Capita	(6) Log Expenditures Per Capita
			Panel A: Using 1985 as Baseline Year			
% Elderly	0.016	0.046***	0.128***	0.045***	0.028**	0.022**
	(0.014)	(0.010)	(0.025)	(0.008)	(0.011)	(0.011)
N	7,891	7,871	6,118	7,891	7,846	7,846
			Panel B: Taylor-linearized with exposure-robust standard errors			
% Elderly	-0.008	0.005	0.060***	0.019***	0.013***	0.011***
	(0.007)	(0.004)	(0.003)	(0.001)	(0.004)	(0.004)
N	8,047	8,009	6,144	8,047	7,968	7,968

Note: ***p< 0.01. **p<0.05. *p<0.1. Outcome variables measured in 2021 dollars. All regressions include commuting zone and year fixed effects, as well as 1990 population shares in four age groups – under 18, 18-44, 45-64, and 65 or older older – each interacted with year fixed effects. In panel A, robust standard errors are clustered at the commuting zone level. In panel B, standard errors are computed using the equivalent shock-level regression and are clustered by exact birth cohort.