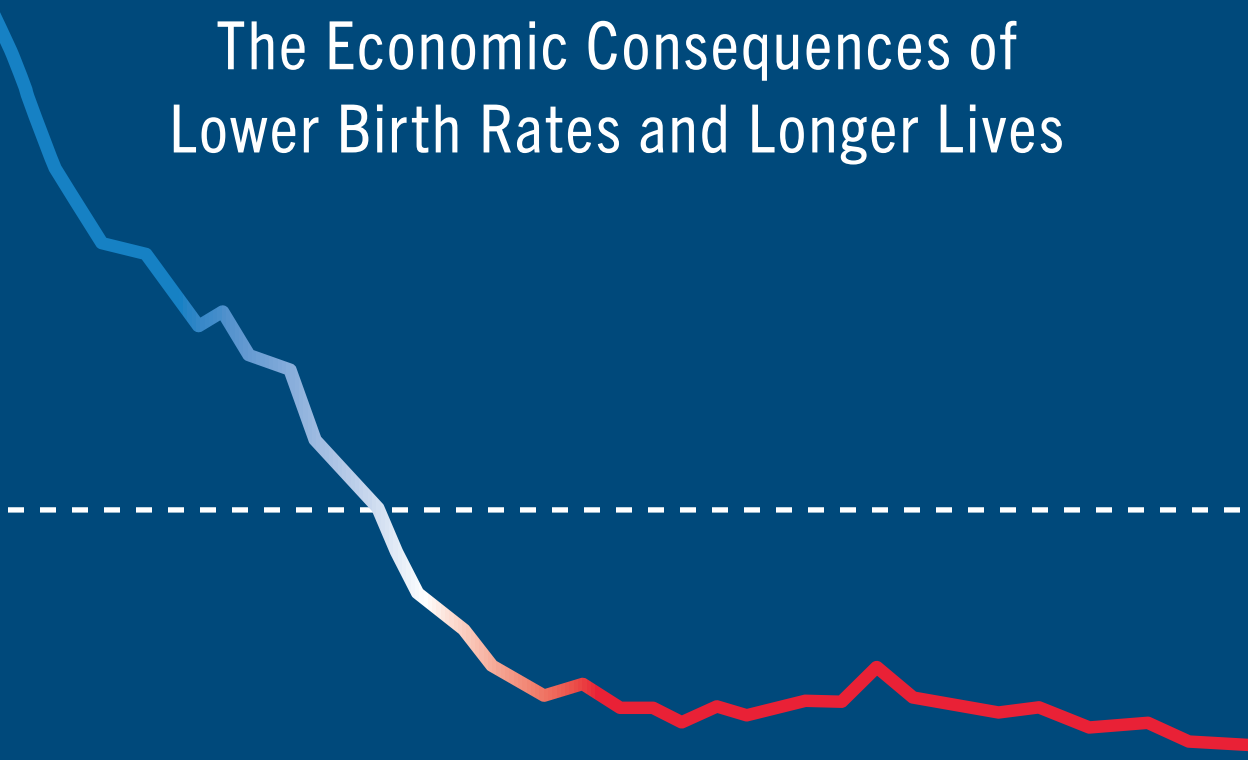
Demographic Headwinds

The Economic Consequences of Lower Birth Rates and Longer Lives



Edited by **MELISSA S. KEARNEY** and **LUKE PARDUE**

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CHAPTER

Introduction

by Melissa S. Kearney and Luke Pardue

FEBRUARY 2026

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AUTHORS

Melissa S. Kearney* and Luke Pardue**

The United States is in the midst of a consequential demographic transition, marked by the dual trends of a sustained decline in the country's birth rate and a rise in life expectancy.

As shown in figure 1, following the mid-twentieth-century Baby Boom and its subsequent reversal, the US general fertility rate held roughly steady for several decades at around 65 to 71 births per 1,000 women of childbearing age. But that stability abruptly came to an end around 2007, and births have been on a downward trend since, falling to a historic low of 54.6 in 2023. The associated US total fertility rate, which approximates the average number of children a woman will have over her lifetime given the current age profile of childbearing, declined from 2.12 in 2007 to 1.63 in 2024, well below 2.1—the level at which a population replaces itself across generations.[1] At the same time, average lifespan in the US has consistently risen.

As figure 2 displays, a person born in the US in 1960 was expected to live to 70 years old, on average. By 2023, the average life expectancy had risen to 78.4 years. Amid low birth rates and rising life expectancies, the share of the US population 65 or older has grown substantially, especially in recent decades. Over the 20-year period from 1985 to 2005, the share increased from 11.7 to 12.1; in the 20 years since, it has shot up to 17.9 percent (World Bank 2025b).

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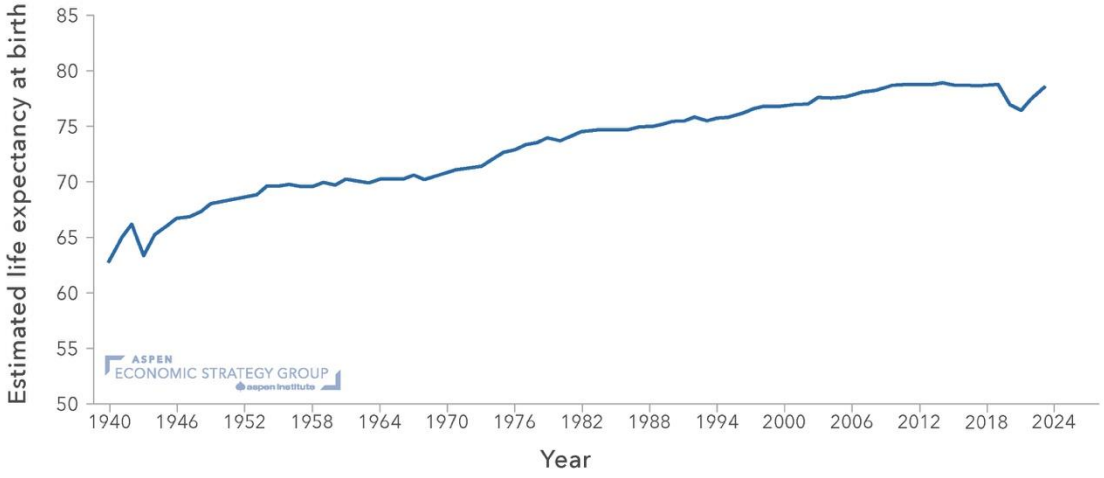
[1] The *general fertility rate* is a point-in-time measure of births, offering a picture of fertility trends in a given year. The *total fertility rate*, on the other hand, is a calculated estimate, constructed by summing the fertility rates across five-year age groups and multiplying by five. It reflects the number of children a woman might expect to have over the course of her life, assuming she follows current fertility patterns of women across these age groups.

Figure 1: US general fertility rate, 1940–2024

Note: 2024 data is provisional.
Sources: Hamilton et al. 2012 and 2025; Osterman et al 2024

Figure 2: Estimated life expectancy at birth (years), 1940–2023



Sources: Arias et al. 2025; Tejada et al. 2020

An immediate demographic consequence of an inverted population pyramid—that is, one where there are fewer young people and more old people—means that the share of the population of traditional working age (20 to 64 years old) is declining. This decline puts more pressure on a smaller share of the population to contribute to economic activity and to care for an aging population. The share of the US population of working age was 60 percent in 2016; it fell to 58 percent in 2024 and is expected to continue falling (Congressional Budget Office 2025a). Over the 20-year period from 1985 to 2005, the age dependency ratio—the number of older dependents per hundred members of the working-age population—rose from 17.6 to 17.9; in the 20 years since, it has skyrocketed to 27.2 (World Bank 2025a).

This decline in the birth rate, along with stalled and declining immigration, has resulted in a marked slowing in US population growth: Growth in the decade from 2010 to 2020 was the second-lowest in US recorded history, barely higher than the population growth the US experienced in the 1930s during the Great Depression (US Census Bureau 2021; Gibson and Jung 2002). The Congressional Budget Office projects that the US population will stop growing in 2056 (CBO 2026).

These developments raise important questions about the prospects of US labor market and business dynamism; about national, state, and local public finances; and about the environmental impact of population decline. In what ways does this demographic transition represent a *challenge* to maintaining current living standards—and in what ways does it not? This volume considers four aspects of these questions.

1. *The Environmental Benefits (or Not) of Low Fertility and Population Decline*

One common, sanguine reaction to impending population decline is a suggestion that this trend will help address US environmental and climate challenges. In ***The Environmental Benefits of Low Fertility and Population Decline Are Overstated***, Kevin Kuruc provides a careful assessment of this notion, concluding that current population trends are unlikely to lead to any meaningful environmental benefits in the twenty-first century. He explains the core issue of timing mismatch—demographic change unfolds over many generations, while effective responses to emissions and environmental harm require immediate action. Simply put, it is too late for declining fertility to make a large difference in population size this century, and by the end of this century, it will be too late for population changes to make a large difference to eventual warming.

Kuruc further emphasizes that effective climate strategies, such as carbon capture, require high fixed capital and labor costs. The smaller the economy, the larger the share of national income required to achieve climate goals. He additionally examines—and rejects—claims that a smaller population will relax demands on natural resources. Kuruc argues that evidence reveals that modern natural-resource constraints are weak and of declining importance. Hence, increasing the

availability of these resources per person via population decline is unlikely to make a noticeable difference to living standards.

In addition, climate mitigation and more-efficient use of natural resources depend on human ingenuity, technological innovation, and tax capacity. These paths become more difficult to pursue amid population decline, with fewer minds to create new innovations and a smaller tax base from which to draw the resources to finance these high-fixed-cost investments. Kuruc concludes by warning that smaller communities may lack the political resolve to pass the kinds of long-term sustainability policies necessary to effectively address climate change, as a smaller and older voting base is, in his assessment, less likely to design, vote for, or enforce rules that restrict resource use. Ultimately, Kuruc concludes that welcoming depopulation on environmental grounds is unscientific and potentially counterproductive to effectively addressing climate goals.

2. The Age Divide in the American Workplace

These demographic shifts are already affecting the composition of the US labor market. In ***The Age Divide in the American Workplace***, economists Nicola Bianchi and Matteo Paradisi highlight the firm dynamics that result from an aging population and workforce. Crucially, the rise in life expectancy highlighted above has been accompanied by improvements in later-life health, allowing many older workers to postpone retirement. As a result, high-paying leadership positions are increasingly held by older workers: In the mid-1970s, workers over 50 were about 5 percentage points more likely than workers under 30 to be employed in management occupations in the top quarter of the wage distribution. By 2024, this gap had widened to almost 8.3 percentage points.

Bianchi and Paradisi observe that the greater availability of older, experienced workers can be beneficial for firms, at least in the short term, as firms can rely on more workers with deep firm-specific knowledge and experience. However, this same force also results in “congestion effects” within firms, which can slow the advancement of younger cohorts. Younger workers face fewer opportunities to move into high-paying and managerial jobs, limiting their ability to make key life investments, such as buying a home or starting a family, and to gain the leadership experience they will eventually need. This risk is not hypothetical; the authors show that it is happening empirically.

The authors characterize this phenomenon as a shift in fortunes across generations, where gains from experience for older workers come at the cost of decreased opportunities for younger ones. As firms benefit from potential short-term productivity gains, they also neglect long-term investments in the next generation of the labor force. The central task for firms and policymakers is thus to ensure that the benefits of longer and more productive careers for older workers do not come at the expense of the dynamism and opportunities that younger workers need to thrive.

3. *Low Fertility and Fiscal Sustainability: The Effects of Past and Future Fertility Rates on the US Federal Budget Outlook*

The country's demographic trends have also shaped the US federal government's spending and revenue patterns, contributing in large part to the large and growing federal debt, which the CBO projects will grow from 98 percent of GDP in 2024 to over 150 percent by 2055 (CBO 2025b). Lisa Dettling and Luke Pardue examine the role of these trends in shaping America's current fiscal position, and the potential for a reversal of these trends to relieve our fiscal pressures in ***Low Fertility and Fiscal Sustainability: The Effects of Past and Future Fertility Rates on the US Federal Budget Outlook***.

Their analysis first finds that the dramatic rise and fall in fertility rates during and after the mid-twentieth-century Baby Boom led to a marked rise in old-age entitlement spending, primarily in Social Security and Medicare, as the Baby Boom cohort entered retirement. As life expectancy continues to rise, and America's elderly population lives longer than ever before, old-age entitlement spending will continue to place pressure on federal deficits and debt for the next three decades.

Then, looking at how shifts in near-term fertility trends would affect the federal budget in the coming decades, the authors find that deficits and debt are projected to remain on an unsustainable path through 2055 under both a baseline scenario of continued low fertility and one in which the US returns to a replacement-level total fertility rate in 2026. In the outlook beyond 30 years, the fiscal position would gradually become relatively better if fertility rates were higher. However, given the current unsustainable trajectory of the US federal debt, it appears likely that changes in tax or spending policy would need to occur before the fiscal benefits of higher fertility rates could be realized.

4. *Implications of Low Fertility and Declining Populations for the Operations of US State and Local Governments*

The collapse in US birth rates in particular geographic regions and communities poses significant challenges for local governments tasked with providing high-fixed-cost services, including education and health care. Indeed, many local areas are already dealing with population decline: Roughly half of US counties lost population from 2010 to 2020 (Asquith and Mast 2024). In ***Implications of Low Fertility and Declining Populations for the Operations of US State and Local Governments***, Jeffrey Clemens outlines the contours of these challenges.

Using data on public school districts, Clemens provides preliminary evidence that scaling down capital-intensive services, particularly schooling, is considerably more difficult than scaling them up. Looking at school district enrollment and expenditure data, he estimates that the per-enrollee

cost increases associated with a 10 percent enrollment decline were four times larger than the cost decreases associated with a 10 percent enrollment increase. State and local governments will have to deal with difficult decisions surrounding the closure of underutilized schools and other infrastructure.

Regions with contracting populations will face additional challenges as a smaller working-age population bears the burden of funding pensions and retiree health plans for larger aging cohorts. Clemens points out that, as discussed above in the context of the federal debt, lower fertility can create a short-run fiscal dividend for localities that serve fewer children. Policymakers should use that time to prioritize efficient retrenchment to accommodate the declining need for education and other public services.

To be sure, the country faces difficult decisions across many spaces as it manages a very different future. Our aim for this series is to highlight four such challenges we view as particularly important and to spur scholars and policymakers to think further about solutions.

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The Age Divide in the American Workplace

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AUTHORS

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SUMMARY

Demographic shifts are reshaping the U.S. labor market, as the share of the population within the working age has begun to decline. This paper addresses the implications of this decline with a focus on within-firm dynamics. As longer lifespans and improved health lead more older workers to delay retirement, experienced employees are increasingly concentrated in high-paying managerial and leadership roles. The gap in management representation between workers over 50 and those under 30 has widened substantially over time, reflecting a growing age divide at the top of the wage distribution. While this greater availability of experienced workers can be beneficial for firms in the short-term, it can also generate "congestion effects" that can slow the advancement of younger cohorts. Reduced opportunities to move into high-paying and managerial jobs limit younger workers' earnings growth and ability to make key life investments, and this congestion constrains the development of future managerial talent. The authors argue that this divide is best understood as a shift in fortunes across generations, where gains from experience for older workers come at the cost of decreased opportunities for younger workers. As firms benefit from potential short-term productivity gains, they also neglect long-term investments in the next generation of the labor force. The central task for firms and policymakers is thus to ensure that the benefits of longer and more productive careers for older workers do not come at the expense of the dynamism and opportunities that younger workers need to thrive.

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A. Introduction

In today's US labor market, older workers are increasingly concentrated in the most desirable jobs. They hold a growing share of managerial positions and capture a large fraction of the high wages available in the economy. At the same time, their younger coworkers are starting their careers lower in the pay distribution and are moving up the corporate ladder more slowly than previous cohorts did.

We argue that these shifts largely stem from a fundamental demographic change. Like most other high-income economies, the United States has been aging. Longer life expectancy and improvements in health care have contributed to an increase in the number of older workers who decide to postpone retirement and remain active in the labor market. For firms, this greater availability of older workers has clear short-term benefits: Companies can rely for longer on a larger number of employees with deep firm-specific knowledge and experience, leading to greater internal stability and longer leadership continuity. For many older workers, longer and more rewarding careers translate into greater financial security and better financial preparedness for retirement.

However, the same process that benefits firms and older workers today has created challenges for younger workers. When older employees stay longer in their roles, the number of openings available to younger cohorts shrinks, particularly in organizations that are not expanding rapidly. Younger workers face fewer opportunities to move into high-paying and managerial jobs, and their professional advancement during early career stages becomes flatter and less fulfilling.

Over time, this slowdown in younger workers' early opportunities can erode their lifetime earnings, limit their ability to make key life investments (such as buying a home or starting a family), and reduce the accumulation of managerial and supervisory experience that will be needed when it is their turn to lead.

Therefore, we argue that the current consequences of workforce aging inside firms are best understood as a shift in fortunes across generations. The gains from experience and longevity enjoyed by older workers have come alongside mounting pressures on those just entering the labor market. At its core, this duality reflects a broader slowdown in economic growth across the United States and other high-income economies: Even as firms reap the potential short-term productivity gains from retaining more experienced staff, they have been able to absorb the rising supply of older workers in large part by constraining early opportunities for younger ones. How aging will shape labor markets in the future will depend on how firms and policymakers respond to the differing needs of younger and older workers.

B. The Issue: An Aging Workforce

i. The Aging of the US Workforce

The United States, like most other high-income economies, is getting older. Over the past half-century, the country's average age has climbed steadily, driven by longer lives, fewer births, and the gradual passage of the baby-boom generation into later stages of life. Current Population Survey (CPS) data show that the mean age of the US resident population was 33 years in 1976 and rose to 39 years in 2024 (the last full year of data available at the time of writing). The labor market has mirrored this demographic transformation. Over the same period, the mean age of workers increased from 38 to 42 years (CPS).[1]

Beyond the mean worker age, the whole age structure of full-time private-sector employment has changed dramatically between 1976 and 2024, as displayed in figure 1. In the mid-1970s, this distribution had a familiar pyramid shape: Workers in their twenties and early thirties accounted for almost half the workforce, and relatively few people were still in the labor force past their late fifties. In 2024, the shape was much more top-heavy. Employment was spread much more evenly across ages 30 to 60, and the groups representing workers in their late fifties and early sixties were comparable in size to many mid-career age groups.

Looking more closely at individual age groups, we observe that the share of full-time private-sector jobs held by workers aged 20–24 fell by 7 percentage points between 1976 and 2024, the largest decline among all age groups. Over the same period, the share held by workers over 60 rose by 3 percentage points, the largest gain among all age groups. The overall result of these shifts is that workers over 50 now account for nearly 30 percent of full-time private-sector workers.

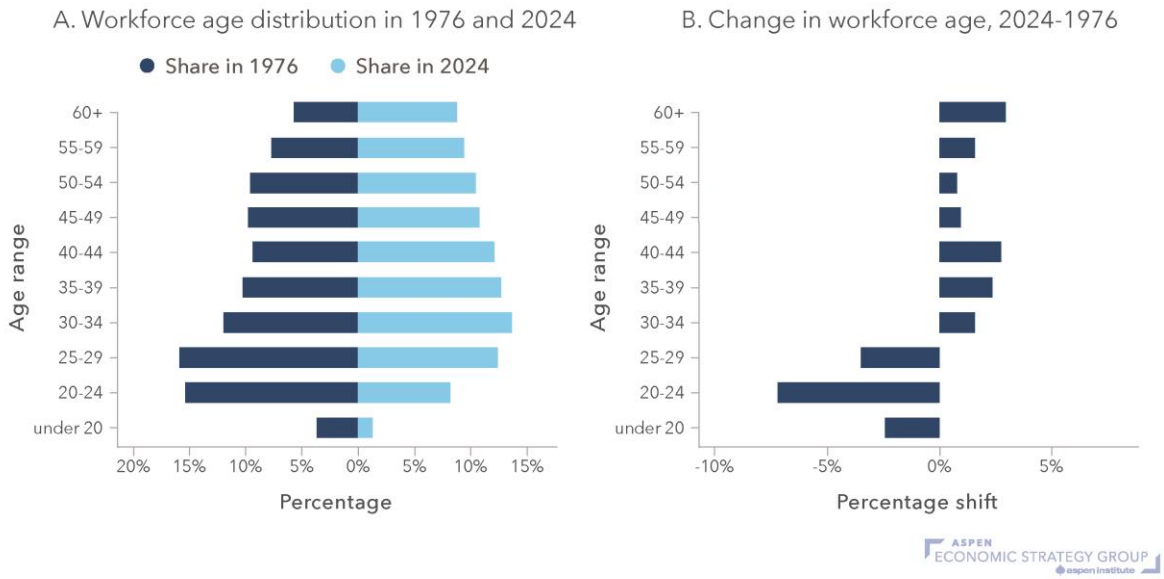
ii. Diverging Fortunes for Older and Younger Workers

Standard economic reasoning provides a useful starting point for thinking about how sustained workforce aging should affect the careers of different generations. If we assume that younger and older workers bring somewhat different but overlapping skills to production, then the relative supply of each group matters for how wages evolve. In this framework, an increase in the supply of older workers should, all else equal, put downward pressure on older workers' wages relative to those of younger workers. Over time, this pressure would be expected to narrow any pay differences between age groups and bring their labor market outcomes closer to balance.

[1] The worker sample we consider in this paper comprises full-time private-sector employees who worked at least 24 weeks during the prior year and earned positive wages.

However, the US experience shows the opposite pattern. CPS data charted in figure 2 indicate that the wage gap between older and younger workers has not narrowed but instead widened sharply since the mid-1970s.[2] The real wages for older workers have trended steadily upward over the whole period: compared with 1976, mean weekly wages for workers over 50 were approximately 20 percent higher in 2024. By contrast, younger workers have seen much weaker gains. Their mean weekly wages fell through the 1980s and early 1990s. By 1995, they were roughly 17 percent below their 1976 level. Afterwards, and especially after 2016, they gradually recovered, exceeding their 1976 level for the first time in 2019. Even after accounting for this recent growth, mean weekly wages for under-30 workers in 2024 were only 5 percent higher than in 1976, falling short of the 20 percent gain experienced by older workers.

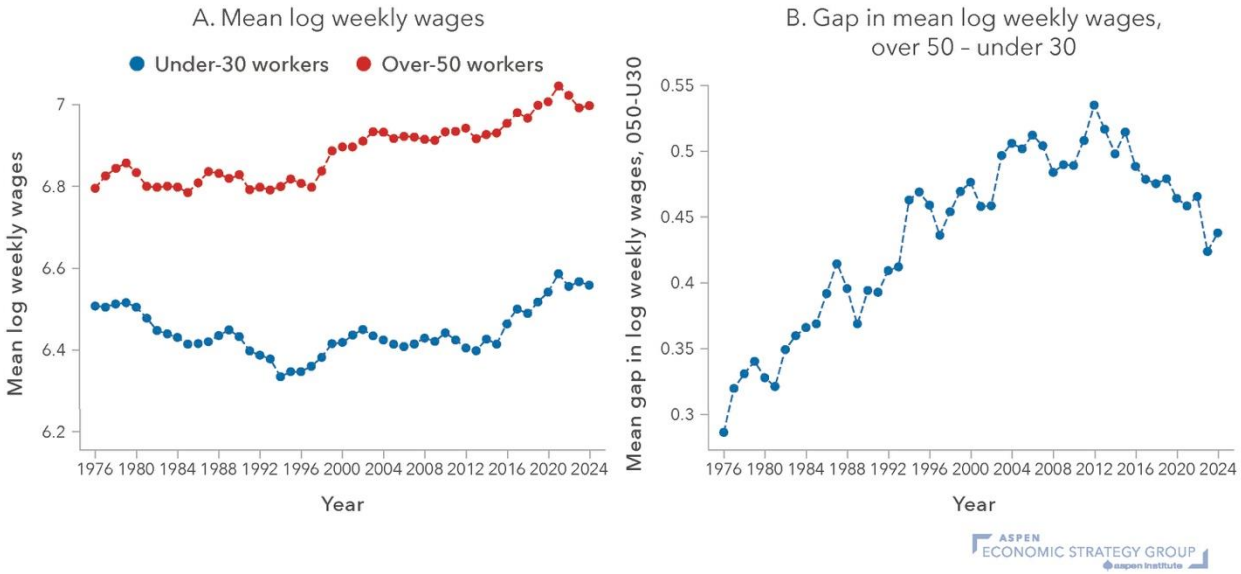
Figure 1. Workforce age, 1976 vs. 2024



Notes: Panel A shows the age distribution of workers in the United States in the first and last sample years: 1976 and 2024. The bars report the share of full-time private-sector employment accounted for by workers in each age group. Panel B plots the change in these shares between 1976 and 2024. The sample includes full-time private-sector employees who worked at least 24 weeks during the prior year and earned positive wages. It includes workers between 16 and 65 years old. Statistics are weighted using CPS weights. Source: IPUMS CPS (Flood et al. 2024), authors' calculations.

[2] All wages used for this analysis are expressed in real terms using the non-seasonally-adjusted consumer price index for all urban consumers (CPI-U). Data on this deflator are available for download on the website of the US Bureau of Labor Statistics: https://data.bls.gov/timeseries/CUUR0000SA0.

Figure 2. Wage gap between older and younger workers

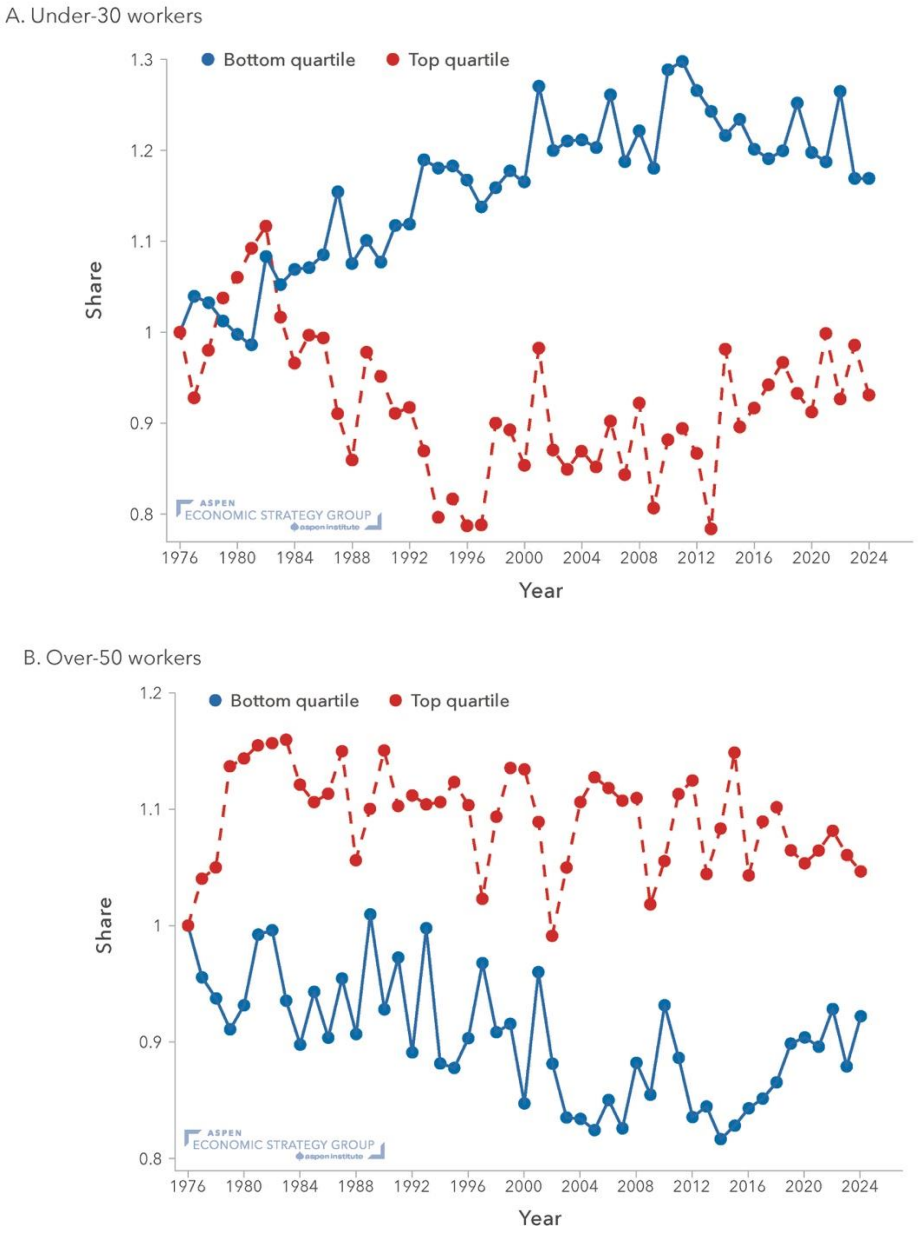


Notes: Panel A shows the mean log weekly wages of workers below 30 years old and above 50 years old. Panel B computes the difference in mean log weekly wages between the two age groups. The sample includes full-time private-sector employees who worked at least 24 weeks during the prior year and earned positive wages. Statistics are weighted using CPS weights. Source: IPUMS CPS (Flood et al. 2024), authors' calculations.

These patterns are easier to see when we look directly at the wage difference between the two groups. In the late 1970s, workers over 50 earned roughly 35 percent more per week than workers under 30. Over the following four decades, this gap widened steadily, reaching a peak in the early 2010s, when older workers earned about 55 percent more. It has narrowed somewhat in the last decade, as the oldest baby boomers have begun to retire and leave the very top of the wage distribution, but even in 2024, older workers still earned 47 percent more per week than younger workers on average. And because working lives are now longer, with many employees remaining in senior roles well into their late sixties, there is little reason to expect this pay gap to return to the more modest levels observed in the 1970s without further intervention from firms or policymakers.

There are two additional pieces of evidence that describe how lopsided the career outcomes of younger and older workers have become over the past five decades. First, figure 3 shows that, over time, younger workers have become considerably more likely than their 1970s counterparts to be in the bottom quarter of the wage distribution and less likely to be in the top quarter. For workers over 50, the pattern is broadly reversed. Relative to 1976, their probability of being in the bottom quartile has gradually fallen, reaching around 15–17 percent below its baseline level during the 2010s, while their probability of being in the top quartile has typically been between 5 and 15 percent higher.

Figure 3. Representation in pay quartiles

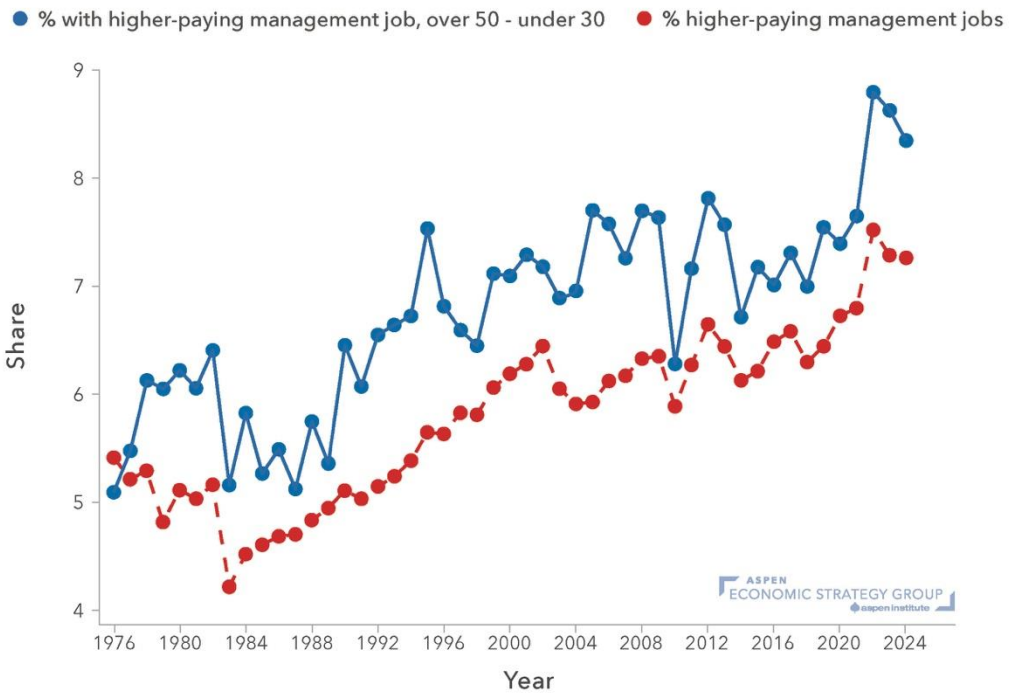


Notes: Panel A shows the probability of workers under 30 years old being in the top and bottom quartiles of the pay distribution in each year between 1976 and 2024. Probability = 1 in 1976. Panel B shows the same probability for workers over 50 years old. The sample includes full-time private-sector employees who worked at least 24 weeks during the prior year and earned positive wages. Statistics are weighted using CPS weights. Source: IPUMS CPS (Flood et al. 2024), authors' calculations.

Second, older workers have pulled further ahead of younger workers in access to desirable, higher-paying managerial jobs, as displayed in figure 4. In the mid-1970s, workers over 50 were about 5 percentage points more likely than workers under 30 to be employed in management occupations in the top quarter of the wage distribution. By 2024, this gap had widened to almost 8.3 percentage points. Over the same period, these higher-paying managerial roles grew from just over 5 percent to a little more than 7 percent of full-time private-sector jobs. Therefore, the inability of younger workers to capture a larger share of these positions was not simply due to a shrinking number of these career opportunities.

In conclusion, at a time when their numbers in the labor force were rising dramatically, older workers increasingly occupied higher-paying jobs and leadership positions. Younger workers, by contrast, faced declining representation at the top and limited access to managerial pathways. Bianchi and Paradisi (2024) show that these patterns are common to most high-income economies, rather than being unique to the United States.

Figure 4. Share of managerial positions



Notes: This figure shows two variables. First: the difference between over-50 and under-30 workers in their probability of holding higher-paying managerial jobs. These jobs are defined as occupations with SOC (Standard Occupational Classification) code 11 and in the top quartile of the pay distribution. Second: the share of higher-paying managerial jobs in the economy. The sample includes full-time private-sector employees who worked at least 24 weeks during the prior year and earned positive wages. Statistics are weighted using CPS weights. Source: IPUMS CPS (Flood et al. 2024), authors' calculations.

iii. Generational Congestion

The evidence reviewed so far points to a striking conclusion: Workforce aging is not necessarily negative for firms. In the US labor market, where employment is largely at will, companies could readily adjust if older workers were unproductive. They could reduce their ranks, replace them with younger hires, or limit their wage growth. But that is not what we see. Instead, firms appear to find value in retaining and rewarding older workers. Over recent decades, older employees have not only stayed in the labor force longer, but they have also continued to enjoy rising wages and better access to key jobs within firms.

From the perspective of firms, the increased availability of experienced employees can therefore be a clear net positive. It expands the pool of workers who can take on decision-making roles, manage teams, and provide leadership continuity. For older workers themselves, the benefits are obvious: longer and more rewarding careers, greater financial security, and more opportunities to leverage accumulated expertise. This state of affairs raises an important question: Why do these gains for older workers seem to come at the expense of younger ones?

The main answer that emerges from our own research is the existence of congestion effects. In firms where job creation has not kept pace with longer careers and the rising supply of older workers—a situation that describes many mature firms in high-income economies—workforce aging, especially at the upper rungs of the hierarchy, can slow the advancement of younger cohorts. The pace at which young workers move into higher-paid roles and experience wage growth slows when internal promotion channels become more congested because firms cannot create new managerial or leadership slots at the rate needed to absorb both older employees staying longer and younger employees seeking promotion. The result is that younger workers face delayed progression, slower wage growth, and fewer chances to reach the top.

One of the clearest pieces of evidence on these dynamics in the United States comes from Mohnen (2025). This study on the retirement slowdown that took place between 1980 and 2017 shows that the lengthening of the working careers of older Americans changed the quality of the jobs that younger workers obtained. In commuting zones where fewer older workers retired, younger workers were less likely to secure high-skill and especially managerial positions, and more likely to begin their careers in low-skill jobs. They also earned lower wages and experienced less job mobility.

The evidence on these congestion effects is not limited to the United States. In fact, the availability of rich employer–employee data in many European countries has allowed for even more detailed analyses. Our own research (Bianchi et al. 2023) provides direct evidence of how workforce aging reshapes careers inside firms. Drawing on Italian administrative records and an unexpected pension reform, the study shows that when older workers extend their tenure, they can alter the internal dynamics of promotion. By occupying senior slots for longer, they reduce

the chances that younger colleagues can advance, leading to slower wage growth and weaker career trajectories for the cohorts behind them. The effects are only present in firms with limited opportunities for expansion, where the pace of promotions cannot keep up with the increased retention of older staff. The patterns observed in Italy are compatible with those documented in other high-income economies, underscoring that career congestion from workforce aging is a structural feature of advanced labor markets rather than a country-specific anomaly (Bianchi and Paradisi 2024).

More recent work by Ferrari et al. (2025) extends this line of inquiry to the Netherlands, exploiting a reform that gradually raised the statutory retirement age. Their analysis, based on monthly firm-level data, shows that retirement delays caused firms to postpone hiring and significantly curtailed the career progressions of coworkers, particularly younger workers and women. They further demonstrate that the additional hours worked by older employees were almost entirely offset by reductions in hours and earnings for other workers, highlighting that the costs of longer careers at the top are often borne by those lower down the ladder.

One could argue that slower career progression would be less concerning if lifetime earnings remained stable or even increased. In that view, workers would simply need to wait longer to realize the full returns from their careers. Yet this state of affairs is not what the evidence shows. Research demonstrates that lifetime earnings have declined for more recent US male cohorts (Guvenen et al. 2022).[3] The authors attribute this pattern primarily to more recent male cohorts entering the labor market with lower earnings and never fully catching up in later career stages.

Even if lifetime income had increased, the deferral of career rewards to much later in life can carry serious implications. Workers cannot easily borrow against the promise of future wages to finance present needs. Delayed earnings make it harder to purchase homes, invest in further education, or start families during prime years, when these decisions are most consequential. In this sense, the congestion effects created by workforce aging can extend well beyond careers inside firms, shaping key life choices and amplifying intergenerational inequalities.

While congestion effects provide one important explanation, economic research has also presented other accounts of why older workers have advanced even as their numbers have increased. These focus on how the content of work and the structure of jobs have evolved in ways that tend to favor experience.

Research shows that jobs requiring open-ended judgment and decision-making have expanded dramatically, rising from just 6 percent of employment in 1960 to more than one-third by 2018

[3] In this paper, the baseline sample is restricted to men with persistent and significant attachment to the labor market, defined as being observed every year between ages 25 and 55 and meeting two earnings-based criteria: annual earnings above a year-specific minimum threshold in at least 15 of the 31 years from 25 to 55 years old, and total lifetime earnings above a cohort-specific minimum threshold.

(Deming 2021). These kinds of tasks draw heavily on accumulated knowledge and the ability to navigate uncertainty, which are skills that typically improve with age. As a result, the age of peak earnings has shifted upward, from the late thirties in the 1960s to the mid-fifties today. As work has become more centered on problem-solving and leadership rather than routine execution, the relative advantage of older, more experienced workers has grown.

A complementary line of research looks more directly at the age-friendliness of occupations. Acemoglu et al. (2022) develop an age-friendliness index capturing whether jobs involve lower physical strain, more autonomy and flexibility, a healthier and safer work environment, better working conditions, and more on-the-job recognition. They show that between 1990 and 2020, nearly three-quarters of US occupations became more age-friendly, with employment in such jobs rising by close to 50 million.

This evolution aligns with broader structural shifts in the economy. As Kerwin Charles et al. (2018) show, the US has experienced a massive decline in manufacturing employment since 2000—5.5 million jobs lost between 2000 and 2017—even as manufacturing output remained stable or grew. Deindustrialization eliminated many physically demanding roles that had long employed younger, less educated workers, while the expanding sectors of the economy (finance, healthcare, business services) offered jobs that were less physically taxing and more compatible with the skills and preferences of older employees.

Taken together, this research suggests that changes in both the task content of work and the sectoral composition of the economy have systematically increased employer demand for older workers.

C. Implications for Firms and the Economy

Addressing these dynamics is inherently complex. At its core, the decline in opportunities for younger workers is closely connected to a long-run fall in US business dynamism. When fewer new firms are created and existing firms age, there are fewer expanding businesses, and hence fewer newly created positions, to relieve the congestion in firms' hierarchies created by an older workforce. Using census microdata, Decker et al. (2014) shows that the startup rate in the United States has fallen markedly since the late 1980s. Consequently, the share of employment and job creation accounted for by firms aged five years or less has substantially dropped over the past forty years. Recent research argues that a substantial share of this trend has demographic roots (Karahan et al. 2024): The sharp slowdown in labor supply growth generated by lower fertility rates can explain between roughly one-third and one-half of the decline in the startup rate.

Then, the most straightforward solution would be to reignite business dynamism and firm growth, since faster expansion would create more opportunities for promotion while still making full use of the experience of older employees. This growth could come from faster gains in labor

productivity, but US labor productivity is already high by international standards. Therefore, it is probably unrealistic to expect large, rapid increases on this margin. The alternative path is to spur firm growth through increases in the productivity of intangible capital, with the most likely candidate being the adoption of artificial intelligence and related technologies. However, the impact of AI remains uncertain: It may complement labor and expand opportunities, but it may also replace tasks in ways that further reduce career progression for younger workers. In that case, technological change could increase firm productivity while reinforcing or even deepening the duality of fortunes described in this paper.

Moving beyond broad growth policies, the alternative is to consider measures targeted more directly at the challenges of an aging workforce. One group of policies aims to reduce the number of older workers within firms. After all, the gradual retirement of the baby boom generation has been associated with some modest improvements in younger workers' prospects, so it is intuitive to think that encouraging earlier exits could help.

For example, voluntary retirement programs could ease congestion by creating room for younger workers. Such initiatives can indeed open slots in firms' hierarchies, but they do not come without drawbacks. At their core, these programs are designed to be attractive to the most productive older employees: those whose high earnings make the buyouts or subsidies worthwhile, and who are often well placed to find employment elsewhere. In practice, this approach means firms risk losing exactly the workers they value most: their most experienced and capable employees.

Mandatory retirement policies represent an even more heavy-handed alternative. While they would certainly create openings for younger employees, they do so by imposing a one-size-fits-all rule that ignores differences in health, productivity, and financial readiness among older workers. Such policies risk forcing out highly effective employees solely on the basis of age, while penalizing those who may need or wish to remain in the labor force longer. For these reasons, most high-income economies have largely moved away from mandatory retirement, and it is difficult to view such measures as a viable response to the challenges of workforce aging.[4]

A third set of proposals moves in the opposite direction: Rather than reducing the number of older workers, governments can try to increase the number of younger workers inside firms, for example, by subsidizing youth hiring and promotion. Evidence from Sweden shows that such subsidies can be effective in raising youth employment (Saez et al. 2019; 2021). However, they can have important drawbacks. In firms that are not expanding or are growing slowly, these incentives may operate through displacement rather than net job creation, effectively pushing

[4] In the United States, the Age Discrimination in Employment Act (ADEA) of 1967 originally allowed mandatory retirement at age 65, but a 1986 amendment abolished compulsory retirement for most workers. Today, mandatory retirement is largely prohibited, with exceptions only in a few occupations (such as airline pilots, certain public-safety jobs, and some high-level executives with specific pension arrangements).

experienced older workers out of the labor force earlier than they would prefer. Moreover, such policies may alter the quality of job matches for younger workers. If less productive firms become more reliant on subsidies, they will have stronger incentives to hire and retain younger employees, potentially steering them toward starting their careers in firms that are weaker than those they might otherwise have joined. Because early career conditions can have long-lasting effects on wages and skill development (Arellano-Bover 2022), these distortions could inadvertently undermine the very cohorts they are designed to help.

A more promising lever is to change what happens inside firms when older workers stay longer. A rational response to workforce aging would be to invest more in internal training and knowledge transfer from older to younger employees. Longer careers can give firms a short-term boost because they retain a large stock of experience on the payroll. However, a potential risk in the longer term is that slower promotions stunt the skill accumulation of younger workers, leaving them less prepared to make good decisions when their turn to lead comes. Instead of trying to solve this tension by pushing older workers out or artificially subsidizing youth slots, firms can treat senior employees as a training asset. Well-designed mentoring and internal training programs can allow younger workers to accumulate skills, networks, and tacit knowledge even when internal promotions are temporarily blocked. Importantly, survey and administrative data suggest that many employers are currently moving in the opposite direction, with the incidence of employer-paid training in the United States in decline since at least the early years of the first decade of the 2000s (Waddoups 2016; Fife et al. 2020). In light of population aging, this declining trend in on-the-job training is likely to become increasingly detrimental for both firms and younger workers.

D. Conclusion

The aging of the workforce is already posing difficult challenges to firms. The central task for firms and policymakers is to ensure that the benefits of longer and more productive careers for older workers do not come at the expense of the dynamism and opportunities that younger workers need to thrive. Striking a balance between experience and turnover will determine whether workforce aging becomes a source of shared prosperity or a driver of deeper generational divides.

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Demographic Headwinds

The Economic Consequences of Lower Birth Rates and Longer Lives

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CHAPTER

Low Fertility and Fiscal Sustainability: The Effects of Past and Future Fertility Rates on the US Federal Budget Outlook

by Lisa Dettling and Luke Pardue

FEBRUARY 2026

Low Fertility and Fiscal Sustainability: The Effects of Past and Future Fertility Rates on the US Federal Budget Outlook

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AUTHORS

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SUMMARY

Low fertility and population aging have shaped the U.S. federal government's spending and revenue patterns, contributing in large part to the growing federal debt. This paper examines the role of these trends in shaping America's current fiscal position and the potential for a reversal of these trends to relieve domestic fiscal pressures. The authors find that the dramatic rise in fertility rates during the Baby Boom has led to a marked rise in old-age entitlement spending, as this cohort entered retirement. Rising life expectancies have also been a significant driver of increased entitlement spending and will continue to place pressure on federal deficits and debt in the coming decades. This paper then evaluates how near-term fertility trends would affect the federal budget under a baseline scenario of continued low fertility and an alternative scenario in which the US returns to a replacement-level total fertility rate in 2026. Under both scenarios, deficits and debt are projected to remain on an unsustainable path through 2055, as changes in the fertility rate today would take multiple decades to meaningfully impact the size of the working-age population. In fact, the budget outlook is somewhat worse under the replacement fertility scenario, and demonstrably so if we factor in the costs of pronatalist policies that might be needed to achieve replacement fertility. In the outlook beyond 30 years, higher fertility would gradually improve the fiscal position. However, given the current unsustainable trajectory of the US federal debt, it is possible that changes in tax or spending policy would need to occur before the fiscal benefits of higher fertility rates could be realized.

[*] Federal Reserve Board; the views expressed are those of the author and do not necessarily reflect those of the Board of Governors or the Federal Reserve System.

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Acknowledgements: We thank Laura Fieveson, Melissa Kearney, Will Peterman, and Dave Ratner for helpful comments and suggestions, and Ella Grant for excellent research assistance.

Introduction

The US total fertility rate (TFR) fell below 1.6 for the first time in 2024, following a general downward trend since the Great Recession (Martin et al. 2025). The fact that fertility rates have remained below the replacement level of 2.1 for over a decade has raised important questions among economists and policymakers about the fiscal implications of sustained low fertility. Key concerns include the solvency of public pensions and the fiscal pressure that imbalances in pay-as-you-go entitlement programs, such as Social Security and Medicare, exert on public debt and deficits. This brief examines how changes in fertility rates in the past 75 years have contributed to the current US federal budget position, and how the potential for sustained low fertility rates in the coming 75 years can be expected to affect the trajectory of federal deficits and debt going forward.

Our analysis reveals that past fertility-rate fluctuations are a significant contributor to the rise in deficits and debt in recent decades. In particular, the dramatic rise and fall in fertility rates during and after the mid-twentieth-century Baby Boom led to a marked rise in old-age entitlement spending (e.g., Social Security and Medicare) as a share of GDP as the Baby Boom cohort entered retirement. And because life expectancy is projected to continue to rise, old-age entitlement spending will continue to place pressure on federal deficits and debt for the next three decades, as these large cohorts live longer than ever before. All told, federal debt is projected to be on an unsustainable path and continue to rise as a share of GDP. We project that federal debt would instead stabilize if it weren't for the projected growth in old-age entitlement spending.

We then consider how persistence of the current low-fertility regime would affect the federal budget in the coming decades. To do so, we compare (1) the trajectory of federal deficits and debt under our baseline assumption that the current low-fertility regime persists, with (2) a hypothetical scenario where fertility rates instead return to replacement levels. We find that deficits and debt are projected to be on an unsustainable path in both scenarios, but the trajectory is somewhat worse over the next three decades with higher fertility rates.

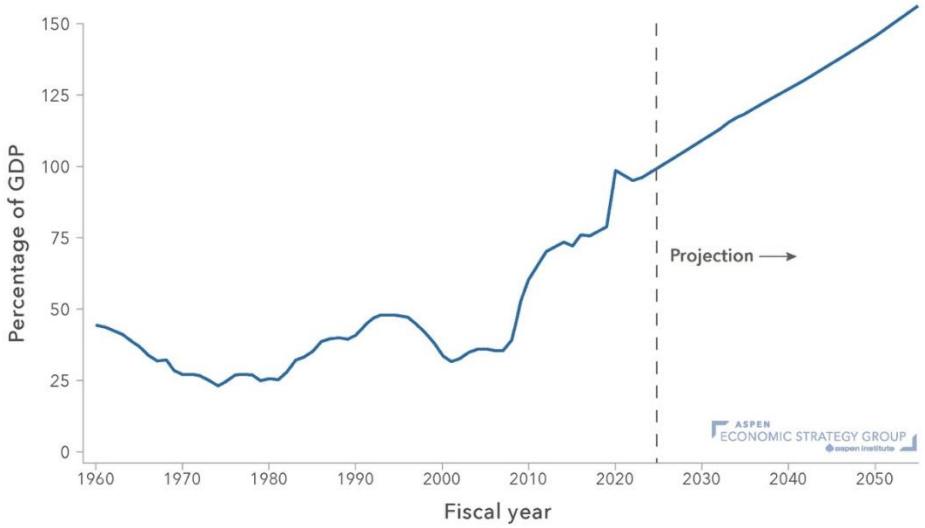
The simple reason for this result is that a baby born now does not enter the workforce and begin to pay taxes for many years, and in the meantime, government outlays on children are larger when fertility rates are higher. If we additionally factor in the potential costs of a pronatalist policy that might achieve higher fertility rates, the fiscal outlook would be much worse. In the outlook beyond 30 years, the fiscal position would gradually become relatively better if fertility rates were higher. However, given the unsustainable trajectory of the US federal debt, it seems very possible that changes in tax or spending policy would need to occur before the fiscal benefits of higher fertility rates could be realized.

Federal debt as a share of GDP has risen substantially in recent decades and is projected to be on an unsustainable path.

From 1960 through 2000, federal debt as a share of GDP hovered between 25 and 50 percent of GDP, as displayed in figure 1. In the middle of the first decade of the 2000s, the federal debt began to steadily climb, reaching 75 percent of GDP around 2015 and nearly 100 percent of GDP in 2024. In the long-run budget projections produced by the Congressional Budget Office (CBO 2025d), which assume current laws remain in place, federal debt will continue to grow as a share of GDP over the next thirty years, reaching over 150 percent by 2055 (the last year included in their most recent long-run projection).

Growth in federal debt over the past 50 years can be explained by generally rising annual deficits. On average, primary deficits (total deficits excluding net interest payments on the debt) in the 1960s through the 1980s were about 0.5 percent of GDP. Then, after a brief period of budget surpluses in the 1990s, primary deficits began to climb each decade thereafter, on average. In 2024, the primary deficit was 3.3 percent of GDP. In CBO's projections from 2025 through 2055, primary deficits remain elevated, and the debt-to-GDP ratio continues to rise.[1] In other words, the projected trajectory of US federal debt is unsustainable.

Figure 1. Debt as a percentage of GDP, 1962–2055



Source: Historical budget data 1960-2024 (CBO, 2025b) and long-run budget projections 2025-2055 (CBO, 2025d).

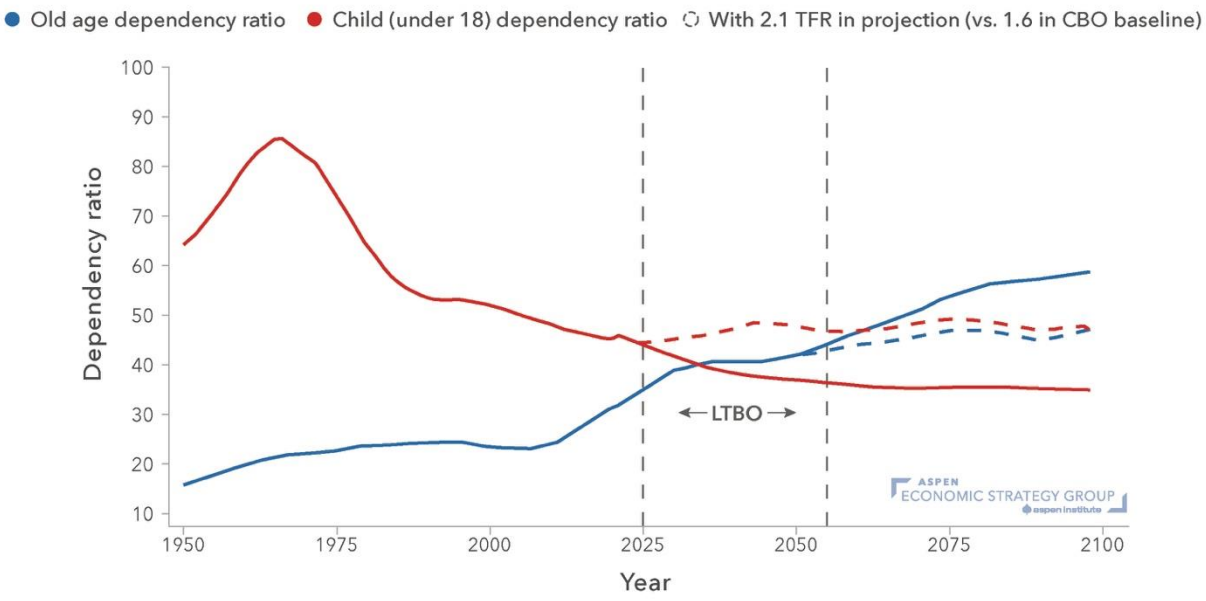
[1] CBO's assumption that federal policies follow "current law" at the time of publication of their last projection in early 2025 overstates the extent to which deficits will fall, as it does not include the effects of the One Big Beautiful Bill Act (OBBBA), which extended many expiring provisions of the Tax Cuts and Jobs Act. CBO estimates that OBBBA will raise deficits going forward (CBO, 2025f). Thus, federal debt as a share of GDP will likely rise more in CBO's next long-term budget projection (scheduled to be released in February 2026, after this article went to press). Auerbach and Gale (2025) find that after accounting for changes from the OBBBA, the debt-to-GDP ratio will reach 183 percent by 2054.

The dramatic swings in fertility in the mid-twentieth century have been a significant driver of the rise in federal deficits and debt over the last three decades.

Fertility rates affect the federal budget because they affect dependency ratios (the ratio of dependents, both children and the elderly, to the working-age population). All else equal, as dependency ratios rise, spending on programs that support dependents rises relative to tax revenue generated by the working-age population. Absent policy changes, a growing imbalance between spending on dependents and revenues leads to rising federal deficits.

The solid lines in figure 2 show old-age and child dependency ratios from 1950 to the present, as well as in CBO's long-run demographic projections (through 2100).[2] The large swings in dependency ratios over the last 75 years can be traced back to the dramatic swings in fertility rates that occurred in the mid-twentieth-century Baby Boom and bust, which dramatically altered relative cohort sizes. During the baby boom, fertility rates rose from around the replacement level of 2.1 births per woman in the 1930s to nearly 3.8 in the late 1950s, before returning to a bit below replacement by the 1970s.

Figure 2. US dependency ratios, 1950–2100, with different projections for fertility rates



Source: Authors' calculations based on population data from the Human Mortality Database (n.d.) and long-run demographic projections from CBO (2025a).
Notes: Old-age dependency ratio is the ratio of the population aged 65+ to the working-age population aged 20–64. Child dependency ratio is the ratio of the population aged under 18 to the working-age population aged 20–64. The dashed lines labelled "LTBO" indicate CBO's long-term budget outlook time frame (2025–2055).

[2] Details on the data and methods used in this brief can be found in the data appendix.

Initially, the relatively large Baby Boom cohort led to a surge in child dependency ratios. Then, as the Baby Boomers entered the workforce in the 1970s and as later cohorts were smaller, child dependency ratios gradually declined. Old-age dependency ratios rose only modestly from 1950 until 2000, before steadily climbing from 2000 to 2025 as the Baby Boomers aged into retirement. In CBO's projections from 2025 onwards, child dependency ratios stabilize, while old-age dependency ratios continue to climb; the former reflect CBO's assumptions that fertility rates will remain low (at 1.6), while the latter largely reflect CBO's assumption that life expectancy will continue to rise.

Although both child and old-age dependency ratios affect the federal budget, old-age dependency ratios are far more important for understanding the rise in deficits and the federal debt over the past three decades. The relative importance of old-age dependency ratios reflects a combination of their dramatic growth and the fact that, on a per-capita basis, federal government spending on the elderly is considerably larger than spending on children. Most of the spending on the elderly reflects the major old-age entitlement programs—namely, Social Security (which provides public pensions for the elderly) and Medicare (which provides health insurance for the elderly). Federal spending on children, including via health insurance (e.g., Medicaid), tax credits, and various transfers, is much smaller. In 2019, per-capita federal spending on the elderly was nearly $30,000, more than five times larger than per-capita federal spending on children (Kearney and Pardue 2023).[3]

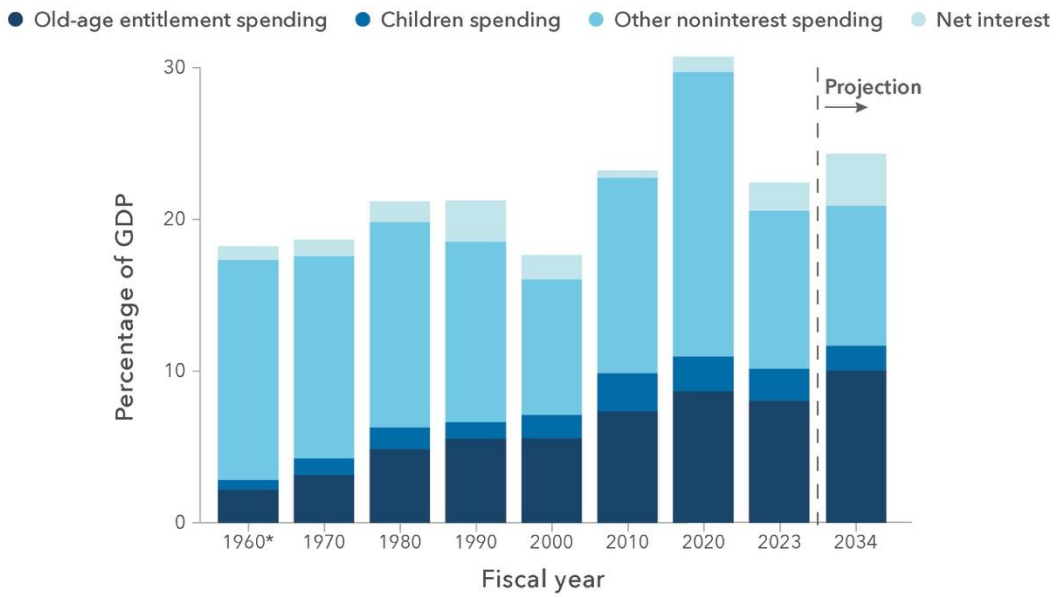
Figure 3 shows a decomposition of federal outlays, separating out the major old-age entitlement programs in yellow (defined as combined spending on Social Security and Medicare), spending on children in green (including health insurance, tax credits, and various transfers), and all other non-interest (pink) and interest spending (blue).[4] In the mid-1960s, spending on old-age entitlement programs was 2.5 percent of GDP. Since then, it has steadily risen to about 6 percent of GDP in 2000 to almost 9 percent of GDP in 2023. By comparison, federal spending on children has remained relatively small as a share of GDP, reaching about 2 percent in 2023.

Overall, the secular rise in spending on old-age entitlement programs has been a major contributor to the secular rise in primary deficits in recent decades. All else equal, if these programs had remained at their 2000 level as a share of GDP, the primary deficit in 2023 would have been about 0.8 percent of GDP, compared to 3.3 percent of GDP.

[3] A much larger share of government spending on children happens at the state and local levels, primarily via spending on public education, which does not directly affect federal deficits or debt. Still, even including state and local government spending, per-capita outlays on children are smaller than per-capita outlays on the elderly (Kearney and Pardue 2023). Jeffrey Clemens's article "Implications of Low Fertility and Declining Populations for the Operations of US State and Local Governments" (this volume) discusses the effects of persistently low fertility on state and local government budgets.

[4] The measure of spending on children is from Hahn et al. 2024. The old-age entitlement spending measures exclude Social Security Disability Insurance (SSDI) spending.

Figure 3. Federal outlays as a percentage of GDP, by decade



Source: Authors' calculation based on historical and projected budget estimates from CBO (2025b) and children spending from Hahn et al. (2024).
*Notes: Old-age entitlement spending includes Medicare and Social Security spending, excluding Social Security Disability Insurance (SSDI) spending. Children spending includes health insurance, tax credits, and transfers, as defined in Hahn et al. 2024. *Budget data for 1962 and children spending data for 1960.*

Were it not for the projected rise in old-age dependency ratios, the US federal debt would stabilize over the next three decades.

CBO projects that old-age dependency ratios will steadily rise from 34.2 percent in 2024 to 44.2 percent in 2055, as seen in figure 2. As a result, spending on the major old-age entitlement programs is also projected to continue to grow relative to GDP and is a key contributor to rising deficits and debt in CBO's projections.

The projected growth in old-age entitlement program spending can be attributed to (1) the size of cohorts expected to enter into retirement (due to past fertility rates and immigration), (2) CBO's expectation that life expectancy will continue to rise, and (3) rising health costs. (Of note, projected future fertility rates do not play much of a role in this growth, a point we will return to in the next section.) Figure 4 decomposes how these forces affect the projected rise in spending on the major old-age entitlement programs and deficits over the next 30 years. To do so, we decompose the effects of rising old-age dependency ratios on old-age entitlement spending, separating out effects stemming from increased life expectancy as opposed to those stemming from larger cohorts entering retirement. We carry out this analysis by simulating the population under two scenarios: constant 2025 mortality rates and constant 2025 age-specific population

shares. We then use per-enrollee spending projections to estimate the effect of each factor on old-age entitlement program spending growth and deficits.

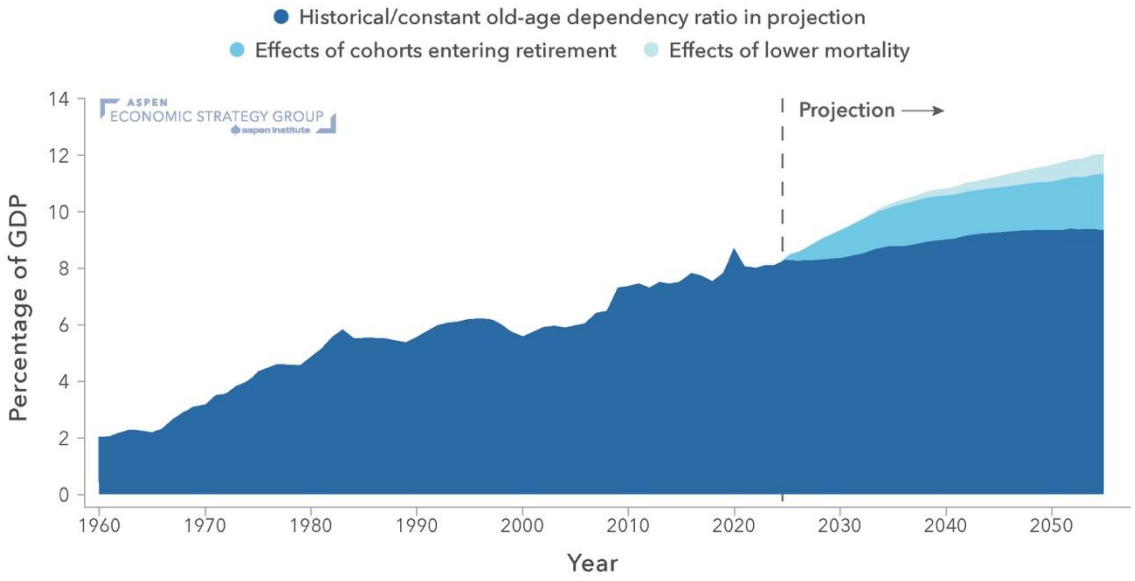
A few observations arise out of this decomposition. First, figure 4a shows that cohort sizes are the primary driver of the growth in old-age entitlement spending in the first ten years of CBO's projections. This is because the still relatively large cohorts born just after the baby boom in 1960–1970 are expected to enter retirement at that time (fertility rates were about 3, on average, from 1960–1970). After 2035, rising life expectancy is the main driver of growth, as the cohorts born in the 1970s and 1980s were much smaller than their predecessors (fertility rates were below 2 in that period).

Second, figure 4a shows that if old-age dependency ratios were to remain at their 2024 level throughout the projection, old-age entitlement program spending would grow much more slowly, reaching only 9.8 percent of GDP in 2055 instead of 12.6 percent. The reason outlays on these programs continue to grow even without a rise in the dependency ratio is because CBO projects that health costs for Medicare will continue to rise.

Third, figure 4b shows that without the growth in old-age entitlement program spending due to rising old-age dependency ratios, deficits would *fall* substantially over the next 30 years. Around 2040, the government would begin operating under a primary budget surplus if it weren't for the growth in such spending. With a budget surplus, the federal debt would begin to fall, net interest payments would be smaller, and total deficits would shrink. This finding is particularly striking because, as noted above, these projected deficit reductions still allow for the projected rise in per-enrollee program costs. All told, this result implies that if it weren't for rising old-age dependency ratios, the federal debt would be projected to stabilize.

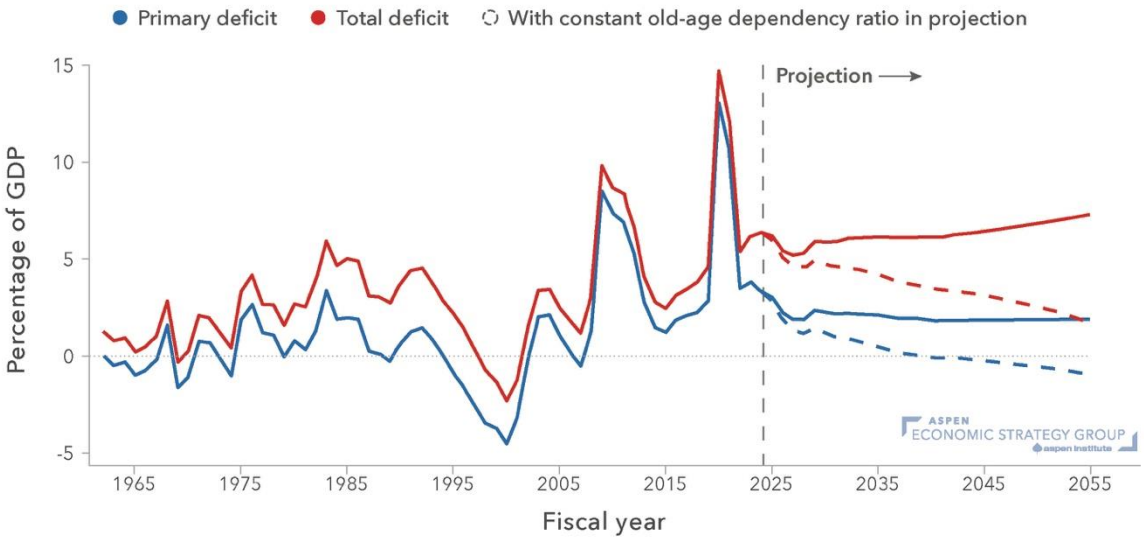
Figure 4. Decomposition of effects of rising old-age dependency ratios on old-age entitlement spending and deficits, 1960–2055

(a) Aging effects on old-age entitlement spending



Source: Authors' calculations based on historical budget estimates from CBO (2025b), long-run budget projections from CBO (2025d), population data from the Human Mortality Database (n.d,), and long-run demographic projections from CBO (2025a).
Notes: Old-age entitlement spending includes Medicare and Social Security spending, excluding SSDI spending.

(b) Aging effects on primary and total deficits



Source: Authors' calculations based on historical budget estimates from CBO (2025b), long-run budget projections from CBO (2025d), population data from the Human Mortality Database (n.d.), and long-run demographic projections from CBO (2025a).

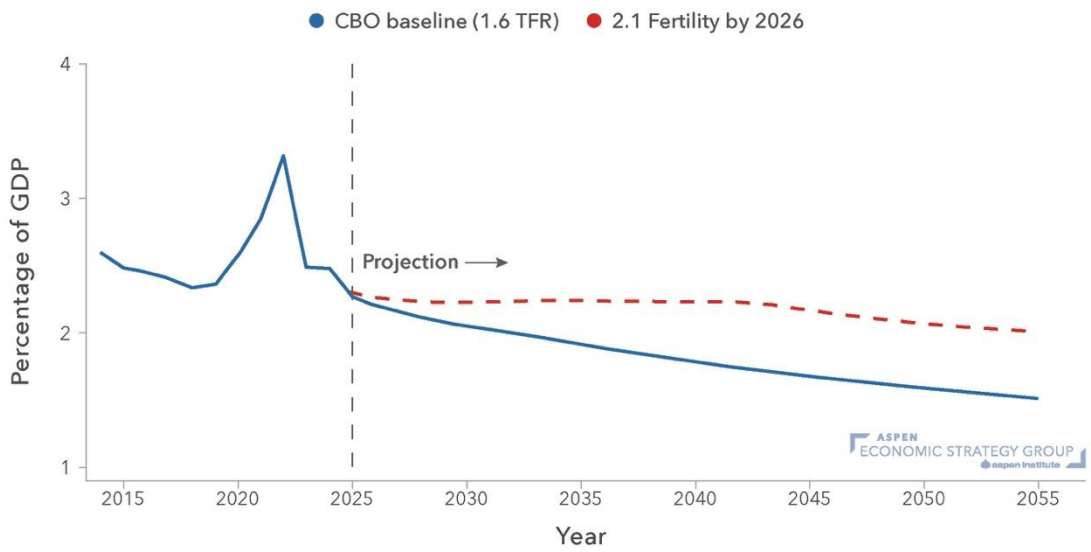
If fertility rates remain low, the US federal debt is on an unsustainable path. But a higher fertility rate would worsen the projected trajectory of federal debt over the next three decades.

CBO's baseline projection assumes fertility rates remain where they are today, at 1.6, throughout its projections. As noted earlier, under these (and other) assumptions, the federal debt is projected to be on an unsustainable path. To evaluate the effects of persistently low fertility on the federal budget outlook, we consider how the trajectory of deficits and debts would be altered if, rather than remaining at 1.6, fertility rates were to rise to the replacement rate of 2.1 starting next year and stay there. Although such growth would be an extraordinary break from recent trends and seems unlikely to occur, the comparison between the two scenarios is illustrative of how fertility rate assumptions alter the federal budget outlook. Figure 2 shows how these assumptions affect projections of dependency ratios.

We find that the federal budget outlook over the horizon of CBO's long-run thirty-year projection is *better* under the low-fertility baseline than the replacement-fertility scenario. The simple reason for this finding is that a child born today will not join the workforce and pay taxes for about 20 years. Accordingly, higher fertility rates do not do much, mechanically, to lower old-age dependency ratios over the 30-year budget window, as can be seen in figure 2. Therefore, they do not do much to reduce federal budget deficits, either. Indeed, the Social Security Administration (SSA) estimates that its trust fund will be depleted by 2034 regardless of whether fertility rates are assumed to be 1.6 or 2.1 in its projections (SSA 2025).

Under the replacement-fertility scenario, the child dependency ratio rises more than it does in the low-fertility baseline, as can be seen in figure 2. As a result of these higher child-dependency ratios, outlays on children would be expected to rise throughout the projection. Figure 5 shows a projection for child-related spending as a share of GDP under both the baseline and replacement-fertility rate scenarios. Spending on children would be expected to rise to about 2.0 percent of GDP by 2055 under the replacement scenario, compared to 1.5 percent in the baseline.

Figure 5. Federal spending on children, with different assumptions for future fertility rates, 2015–2055



Source: Authors' calculations based on children spending from Hahn et al (2024), budget projections from CBO (2025d), population data from the Human Mortality Database (n.d.), and demographic projections from CBO (2025a).

In the final decade of the CBO's 30-year projection, the larger birth cohorts in the replacement-fertility scenario would enter into the workforce, leading to faster labor force growth than in the baseline. This growth would then be expected to raise real GDP growth and revenues, offsetting at least some of the additional child-related spending. Using our estimates of labor force growth under the two scenarios, coupled with CBO's standard rules of thumb on the effects of labor force growth on deficits, we estimate that primary deficits would shrink by about 0.3 percent of GDP per year, on average, over the last decade of the projection through this channel (CBO 2025c). This decrease alone would not be enough to offset the increases in child-related spending shown in figure 5.

It is plausible that this influx of young workers could raise productivity growth enough to fully offset the increase in child-related spending. Based on CBO's rules of thumb, we estimate that productivity growth would need to be about 0.2–0.3 percentage points higher per year to fully offset child-related spending—increases that are large but not completely unrealistic.[5] Still, with higher primary deficits in at least the first 20 years of the projection, federal debt and net interest payments would rise, raising total deficits above CBO's baseline low-fertility scenario. In other

[5] As a point of comparison, Aaronson and Sullivan (2001) estimate that improvements in labor quality (in part via rising educational attainment) raised labor productivity by 0.2 percentage points a year from the 1960s through the 1990s.

words, the federal budget outlook would be worse three decades from now if fertility rates were to rise to replacement and stay there as compared to staying persistently low.

Furthermore, it seems very unlikely that the fertility rate would suddenly rise to replacement without some pronatalist policy action by the government. If we factor in levels of government spending that could plausibly achieve a fertility rate of 2.1, the cost for the government could be enormous. Empirical evidence indicates that cash transfers and tax credits can lead to only modest increases in fertility (Kearney and Levine 2023). To model the hypothetical cost of raising the U.S. fertility rate to 2.1, Stone (2020) utilizes fertility elasticities and costs from past pronatalist programs, scaling them to the magnitude necessary to bring US fertility rates above replacement. Stone estimates that achieving replacement fertility would cost between $200,000 and $1 million per child in tax incentives, transfer payments, and other financial support, translating to between $250 billion and $1 trillion in annual government expenditures (Ponnuru and Stone, 2020). This expense would raise the primary deficit by an additional 0.8 to 1 percent of GDP per year—magnitudes that would cause explosive growth in the federal debt.

Over the very long run, higher fertility rates could improve the budget outlook, but fiscal consolidation could be necessary before that happens.

Beyond the 30-year horizon, the budget outlook would start to gradually improve under the higher replacement-fertility scenario in comparison to the persistent low-fertility baseline, as individuals born in the next few decades would begin to enter the workforce in larger numbers and stabilize old-age dependency ratios relative to the low-fertility baseline, as can be seen in figure 2.

As the old-age dependency ratio stabilizes, the federal budget outlook improves. For example, in SSA's alternative long-run scenarios, a fertility rate of 2.1 compared to 1.6 does little to improve program balances (roughly the difference between benefits and payroll tax revenues) over the next 25 or even 50 years. However, by 2099, the balance improves from –7.4 percent of taxable payroll to –3.5 percent under the 2.1 fertility versus 1.6 fertility rate scenarios, respectively (SSA, 2025).

A key issue would be whether the federal debt became sufficiently high prior to that time such that fiscal consolidation (i.e., higher taxes and/or lower spending) would need to happen, perhaps to avert a fiscal crisis. A fiscal crisis is a situation in which the perceived risks of US public debt become sufficiently high that investors lose confidence and demand higher and higher interest rates on government bonds. If the desire to avert the pain of fiscal consolidation is a reason why higher fertility rates are desirable, then the prospect that a fiscal crisis could occur before the benefits of a larger population can be realized is highly relevant.

There are ongoing debates over what level of debt is sustainable for the United States to maintain or accumulate, and historical evidence offers little consensus on a specific threshold at which a fiscal crisis would occur. Most research rejects the notion of a singular "tipping point" at which rising debt would trigger an immediate fiscal crisis (Edelberg et al. 2025; Furman 2024; Dynan 2023). That said, some research has attempted to estimate the level at which US debt would be on an unsustainable path and the probability of a fiscal crisis considerably heightened. These papers suggest that fiscal consolidation would probably need to occur before the benefits of higher fertility rates can be realized. For example, Gokhale and Smetters (2023) argue that the US debt will become unsustainable by the 2040s and that a fiscal crisis seems probable in the next two to three decades. Elenev et al. (2025) estimate an "austerity threshold" when the debt reaches roughly 189 percent GDP, above which the US government would need to increase fiscal surpluses to safely manage the debt.[6] That said, it is certainly possible that with higher fertility rates—and thus, an expected future increase in the working-age population—the perceived risk of government debt would be lower and there would be more fiscal space.

Final thoughts and some caveats

We find that although past declines in fertility are an important driver of the secular increase in deficits and debt in recent decades, persistently low fertility will not worsen the budget outlook in the next couple of decades. In fact, we find that if fertility rates were to suddenly return to replacement, the budget outlook over the next 20 years would worsen, and demonstrably so if we factor in the costs of pronatalist policies that might be needed to achieve replacement fertility. Beyond the next few decades, a higher-fertility-rate scenario would begin to improve the fiscal outlook. But given the current unsustainable trajectory of the federal debt, it is very possible that fiscal consolidation will need to happen before any potential fiscal benefits from higher fertility rates can be realized.

We would be remiss if we didn't note some caveats to our analysis. The discussion in this article relies in large part on CBO's long-run projections for economic growth, interest rates, and government spending, all of which are incredibly uncertain, and a huge range of alternative outcomes are plausible (see CBO 2025e). Research shows that low fertility is a drag on economic growth and lowers the natural rate of interest (e.g., Bianchi and Paradisi forthcoming; Rachel and Smith 2017; Gagnon et al. 2016 and 2021). If persistently low fertility leads to slower growth than CBO assumes, the budget outlook will worsen; if it leads to lower interest rates than assumed, the outlook will improve. Finally, although this brief focuses solely on the fiscal implications of low fertility, there are, of course, other reasons beyond the fiscal outlook why governments may care about falling birth rates and the prospect of a shrinking population.

[6] As noted earlier, Auerbach and Gale (2025), who update CBO projections to include recent legislation, find that the US debt is likely to reach about that level by the 2050s.

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Demographic Headwinds

The Economic Consequences of Lower Birth Rates and Longer Lives

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CHAPTER

Implications of Low Fertility and Declining Populations for the Operations of US State and Local Governments

by Jeffrey Clemens

FEBRUARY 2026

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AUTHOR

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SUMMARY

Declining fertility and population loss pose significant challenges for state and local governments responsible for providing a range of services to citizens, including education, health care, and infrastructure. Indeed, many areas are already experiencing outright population decline, with roughly half of U.S. counties losing population between 2010 and 2020. This paper examines how shrinking and aging populations affect the operations and fiscal sustainability of state and local governments. Preliminary evidence presented in this paper suggests that scaling down educational services is considerably more difficult than scaling up. The estimated per-enrollee cost increases associated with a 10 percent enrollment decline are four times larger than the cost decreases associated with a 10 percent enrollment increase. Regions with contracting populations will face additional challenges as a smaller working-age population bears the burden of funding pensions and retiree health plans for larger aging cohorts. While lower fertility can create a short run fiscal dividend as local governments serve fewer children, that dividend will only be realized if state and local public officials make efficient retrenchment a priority.

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Introduction

Nationwide, the total fertility rate has now been below replacement since 2010, and appreciably so over the last decade. Roughly half of US counties lost population from 2010 to 2020, as documented by Asquith and Mast (2024). This figure is a dramatic increase from earlier decades and, by Asquith and Mast's accounting, is explained almost entirely by declines in fertility rather than changes in migration patterns. This broad trend and its localized variations pose challenges to the efficiency of the state and local public sectors. More specifically, population decline confronts school districts, health systems, public-safety agencies, and transit authorities with the challenges of managing retrenchment.

The remainder of this paper elaborates on the scope and scale of this emerging trend and the nature of the public-sector management problems that come with it. Using data on public school districts, I provide preliminary evidence that scaling back is much harder than scaling up, resulting in large per-pupil cost increases in contracting districts. Difficult decisions surrounding the closure of underutilized schools and other infrastructure pose an important challenge. Scaling back on staff appears difficult as well. Regions with contracting populations face additional challenges from the burdens posed by underfunded pension and retiree health plans, which are borne by a smaller base of constituents as population declines.

The Issue

i. The Phenomenon of Local Population Decline

Over the last two decades, birth rates have fallen substantially across the United States. Paired with immigration policy headwinds (Edelberg et al. 2025), declines in national population could be imminent. The demographic outlook from the Congressional Budget Office (CBO) forecasts that the number of deaths will first exceed the number of births nationwide in 2030. Even while assuming long-run net immigration of 1.2 million persons per year, fertility trends lead the CBO to forecast a stagnant population by mid-century (Congressional Budget Office 2026).

Substantial regional, and more localized, variations underlie this national trend. As the Asquith and Mast study shows, a substantial share of US counties have already experienced a half-century of net population decline. Vital statistics provide additional insight into the underlying regional and state variations. From 2000 to 2020, the nation's most populous states of California, Texas, Florida, New York, Pennsylvania, and Illinois experienced birth rate declines of 32, 30, 28, 24, 16, and 30 percent, respectively (Martin et al. 2002; Osterman et al. 2022). Relatively moderate declines in some of the New England and Mid-Atlantic states reflect that they had lower birth rates at the 2000 baseline, which has now developed into a source of variations in regional population pressures.

Declining birth rates, conventionally defined as the number of births per 1,000 women of any age, reflect a blend of population aging and declining fertility rates, defined as the number of births per 1,000 women of childbearing age (i.e., between the ages of 15 and 44). Both forces have contributed to recent trends in the United States. Nationwide from 2000 to 2020, for example, population aging accounts for the 5 percentage-point gap between the birth rate's 25 percent decline and the fertility rate's 20 percent decline.

Uncertainty over whether fertility has been permanently depressed or temporarily delayed in the wake of the Great Recession is now being resolved. Any rebound in births (or "catch-up" fertility) among women in their later childbearing years appears modest. This finding results in an increasingly high likelihood that the completed fertility rates of recent cohorts of women will indeed be lower than those of women from earlier cohorts (Kearney and Levine 2021). As things stand, the 2020 data point to below-replacement fertility in all 50 states.

Although US fertility may have rebounded toward replacement levels during the 1980s, the global experience casts doubt on any presumption that below-replacement fertility should, in general, be viewed as a self-correcting development (Geruso and Spears 2025). Put differently, international data provide little reason to believe that fertility rates have a systematic tendency to rebound after falling below replacement levels.

Enrollments in public school districts, to whose budgetary and operational data I will later turn, provide a stark illustration of how persistently low fertility can impact the management of state and local public-service provision. Indeed, school systems face the leading edge of the challenges linked to low fertility, since a given year's fertility rates influence preschool and kindergarten enrollments a mere four and five years on.

Turning to the data, the National Center for Education Statistics (2023) reports region-wide declines in K–12 enrollment across the Northeast and Midwest beginning early in the 2000s. The COVID-19 pandemic brought sharp, additional short-run declines to enrollments, in excess of one million students nationwide (Clemens et al. 2025). Looking forward, the Department of Education forecasts an additional loss of 2.7 million K–12 students nationally from fall 2022 to fall 2031 (National Center for Education Statistics 2023). These declines will bite particularly hard in the US's Northeast and West regions, where they are forecast to approach 10 percent. Moderate declines are also expected across the Midwest.

At the level of individual school districts, enrollment declines have been a common occurrence over the last quarter-century. Among continuously operating school districts that have not merged or otherwise changed their boundaries, the Common Core of Data reveals that a remarkable 60 percent experienced net declines in enrollment from 1994 to 2019. This drop reflects, in part, that small districts, many of which are rural, were more likely to contract over the period in question than were large districts. At the same time, a number of large districts, including several in the Midwest, also experienced dramatic enrollment declines. These include the Cleveland Metropolitan and St. Louis City school districts, both of whose enrollments have

halved since their late-1990s highs. Looking ahead, the forecast loss of 2.7 million K–12 students from fall 2022 to fall 2031 implies sharper and even more widespread enrollment declines, impacting large urban districts nationwide as well as small rural school districts.

In the next section, I develop a set of facts that characterize the scope of state and local government activity. I provide descriptive evidence suggesting that enrollment declines, and population declines more broadly, may pose substantial challenges to the efficiency of the state and local public sectors.

ii. Population Decline and the Expenditures of State and Local Governments

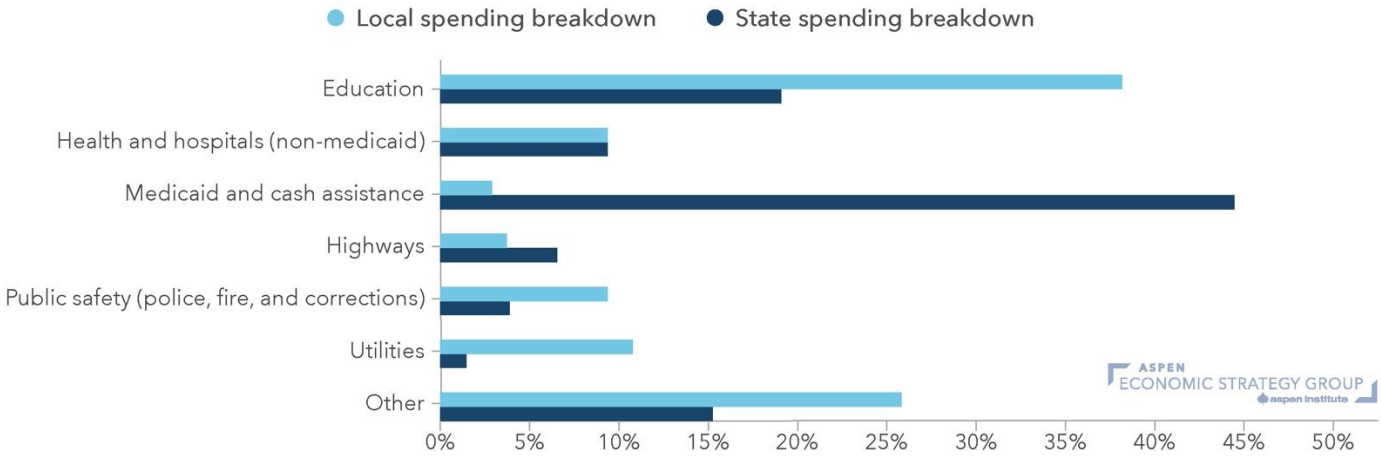
What do state and local governments actually do, and why might declining populations negatively impact the efficiency of public-service provision? This section begins with an overview of state and local government expenditures. It then presents evidence on the long-run relationship between population changes and changes in the per-constituent expenditures of state and local governments.

The functions of state and local governments

Data from the 2023 Annual Survey of State and Local Government Finances provide the Census Bureau's latest snapshot of the scale and mix of state and local government activity. According to the Census Bureau, the direct expenditures of state and local governments amounted to $2.21 and $2.48 trillion, respectively, with states spending an additional $811 billion through intergovernmental transfers that help to finance the expenditures of local governments.

Figure 1 separately illustrates the composition of state and local government spending across functional categories, as assigned by the Census Bureau. Education accounts for a substantial portion of direct expenditure by both layers of government, at 19 and 38 percent, respectively. For states, this spending is primarily on higher education, while local governments spend primarily on K–12 education. States spend substantially on redistribution through their Medicaid and cash assistance programs (44.4 percent of their direct expenditure), with Medicaid being by far the largest of states' redistributive programs. Additional spending on health care and hospitals accounts for roughly 9.4 percent of direct expenditure by both state and local governments; local government spending in this area goes primarily to hospitals. Highways account for a modest share of state and local expenditure (6.5 percent for state governments and 3.7 percent for local governments), while local governments are the primary providers of public-safety services (9.4 percent of their direct expenditure) and utilities (10.8 percent).

Figure 1: Breakdown of state and local government direct expenditures by functional category, 2023



Source: US Census Bureau 2025

Statewide population change and the expenditures of state and local governments

How do changes in expenditure on public-service provision relate to changes in population? Figure 2 illustrates, at a high level, that larger expansions in states' populations predict smaller increases in per-capita expenditures by state and local governments. Using Census data processed by the Urban-Brookings Tax Policy Center (Urban Institute 2025), the figure presents the long-run correlation between statewide population changes and state and local government spending per resident. It presents these data using changes over the 40-year period extending from 1979 to 2019. (I deliberately limit the data to the pre-COVID-19 pandemic period, given the unusual spending circumstances of the pandemic years.)

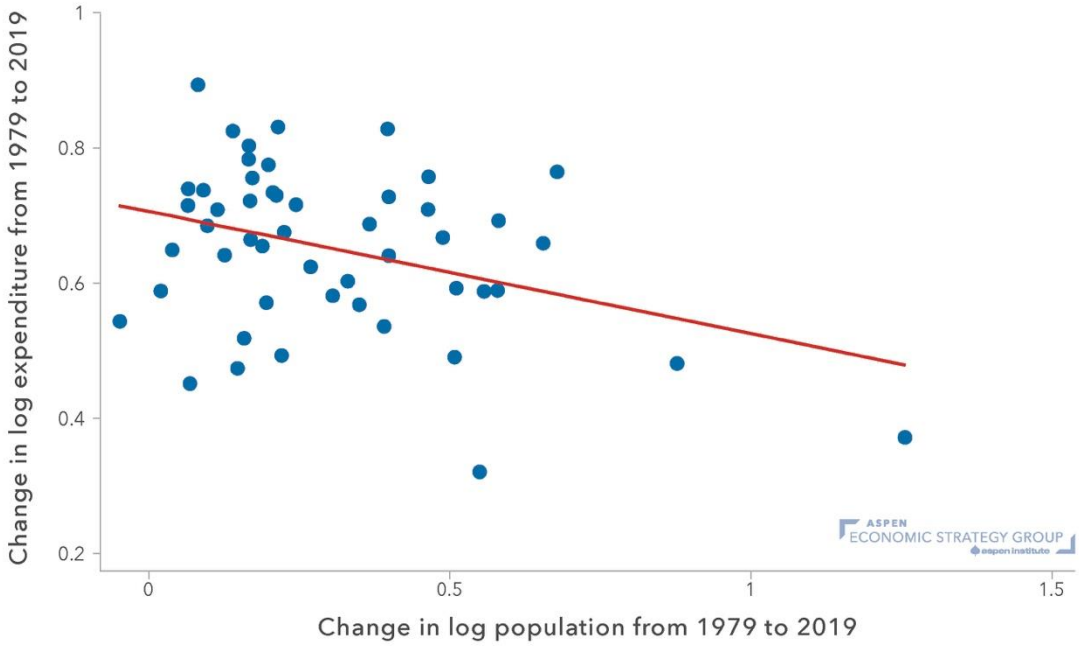
The best-fit line reveals that a 10 percent larger increase in a state's population predicts a 2.2 percent smaller increase in its per-capita expenditure. In other words, while total spending grows as the population increases, per-capita spending grows more slowly when the population grows more quickly. Greater population growth is thus associated with less growth in per-resident expenditure by state and local governments. Put differently, states that experience slower population growth experience greater growth in their per-resident spending burdens. As we will see when I turn to public school districts, many of which have experienced substantial enrollment declines, contracting jurisdictions face an even sharper challenge of escalating per-constituent cost burdens.

The basic pattern in figure 2 holds for education, highway, health and hospital, and utility expenditures. Medicaid and cash welfare assistance expenditures are an exception. This pattern is

interesting in that Medicaid and cash welfare assistance are redistributive programs for which per-capita expenditure reflects choices regarding the generosity of benefits and eligibility rules. Additionally, the federal share of Medicaid expenditure is sufficiently generous that it substantially blunts states' exposure to incremental cost increases. Variations in expenditure on infrastructure and public services, by contrast, will be more closely linked to constituent demand and to the cost of service delivery.

The negative correlation between population growth and growth in per-capita expenditure is modestly stronger for capital than for current operating expenditures. Across broad functional categories, it is strongest for utilities. This fact pattern is suggestive that the relationship between population growth and per-capita expenditure may be driven, at least in part, by standard economies of scale.

Figure 2: Changes in population and changes in real per-capita expenditures by state and local governments, 1979 to 2019



Source: Author's calculations using census data processed by the Urban-Brookings Tax Policy Center (Urban Institute 2025). Each circle represents the changes in log population and log per-capita expenditures from 1979 to 2019 for a single state.

Spending on schools facing declining versus expanding enrollment

Analyses of state aggregates can only go so far. Figure 3 thus looks at the geographically far more granular data on changes in enrollments and expenditures across public school districts. The data come from the Common Core of Data (2025) produced by the National Center for Education Statistics. They have been preprocessed by the Urban Institute and made available through its Education Data Portal for each pre-pandemic year from 1994 through 2019. To avoid instances in which either enrollment or expenditures were impacted by district mergers, the figure presents data on just under 9,000 districts for which the required data are reported in each year and for which the data report no changes to the district's boundaries.[1]

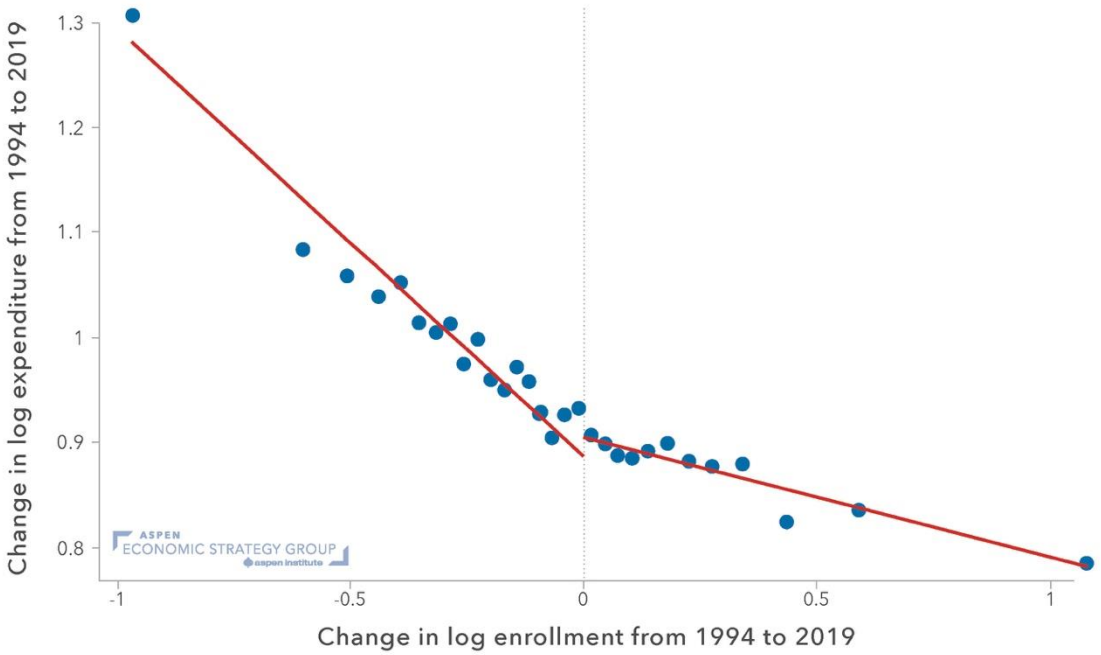
For ease of visual representation, the underlying data have been grouped into 30 bins based on the size of each district's change in enrollment.

Two interesting facts emerge from the school district enrollment-and-expenditure data. First, the overall relationship between enrollment and expenditure changes is remarkably similar to the relationship between population and expenditure changes for the totality of state and local government activity. From 1994 to 2019, 10 percent higher growth in a district's enrollment predicts a 2.4 percent smaller rise in per-enrollee expenditure. This relationship is substantially steeper over shorter time horizons, suggesting gradual adjustment in response to changes in enrollment.

Second, in contrast with long-run changes to the statewide population, which are almost uniformly positive, school districts include many instances of substantial long-run enrollment declines. Figure 3 reveals a sharp asymmetry in the relationship between enrollment and expenditure changes for contracting relative to expanding districts. For districts in decline, a 10 percent larger contraction in enrollment predicts a 4.1 percent larger rise in per-enrollee expenditure. For expanding districts, the comparable figure is a substantively smaller 1.1 percent. This fact pattern is consistent with findings in a recent, related analysis (Lee and Scafidi 2025).

[1] A more comprehensive analysis would require harmonizing the boundaries of districts that merge, such that their expenditures and enrollments are tracked consistently over time and such that the mergers themselves could be analyzed as outcomes.

Figure 3: Enrollment and per-enrollee expenditure changes among regular school districts with stable boundaries



Source: Author's calculations using data from the Common Core of Data (2025) produced by the National Center for Education Statistics, as preprocessed by the Urban Institute and made available through its Education Data Portal. The underlying data on just under 9,000 school districts have been grouped into 30 bins based on the size of each district's change in enrollment. Each circle represents the means of the changes in log enrollment and log per-capita expenditures from 1994 to 2019 across the districts within each bin. Best-fit lines have been estimated separately on the underlying school district observations for the districts with enrollment changes above versus below 0.

While large increases in per-enrollee expenditure are the norm in contracting school districts, there are counterexamples from which lessons can potentially be learned. The examples of the Cleveland Metropolitan and St. Louis City school districts, both of whose enrollments halved between 1999 and 2019, provide an interesting contrast. As reported in the Common Core of Data (2025), the per-enrollee spending of the Cleveland Metropolitan School District nearly doubled in inflation-adjusted dollars over this time period. In stark contrast, the inflation-adjusted per-enrollee expenditures of the St. Louis City School District rose only modestly. These schools have similarly poor test-score performance across the decade preceding the pandemic, as summarized by the Stanford Education Data Archive (SEDA), suggesting that Cleveland's spending growth may not be yielding improved results.[2] Later, I will return to some

[2] As summarized in its readily accessible, district-specific reports, the SEDA data "are based on the standardized accountability tests in math and Reading Language Arts (RLA) administered by each state to all public-school

of the factors that may underlie the substantial divergence in the spending of these two large districts whose enrollments followed similar paths of dramatic contraction.

Implications of contracting populations for hospitals and transit systems

Hospitals and transit systems face pressures that are distinct from and less acute than those facing contracting school districts. This difference arises in part from the fact that they typically serve broader geographic areas than most school districts do, making them less exposed to the acute pressures of localized population decline. Additionally, because they serve the totality of a region's population, while school districts serve the young, they have been less likely to face the full implications of persistently low fertility's consequences. Consequently, a less clear picture has emerged to date of population decline's implications for per-resident spending by hospital and transit systems.

The difficulties hospital and transit systems will face as a consequence of declining population, however, are reasonably clear. As with schools, smaller populations will imply less utilized hospitals. Continued operation of existing facilities will thus become more costly per resident served, which creates pressure for underutilized facilities to close. Similarly, a contracting ridership raises the per-resident cost of sustaining existing transit lines and service frequency. In contrast with the pressure to close facilities outright, transit systems will face pressure to reduce service along margins like the frequency with which routes are run.

What Are the Cost Challenges Posed by Population Decline?

In the remainder of this paper, I discuss the economic factors that may drive the distinctive challenge of adapting to population declines as opposed to accommodating expansions in the demand and need for public services. I organize the discussion around a set of conceptually distinct challenges governments may confront when scaling back. I first focus on challenges associated with the disruption and political frictions that may arise when closing underutilized facilities, including schools, hospitals, and fire or police stations. Next, I briefly discuss challenges linked to other forms of infrastructure. Third, I discuss frictions that complicate

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students in grades 3–8 in each school year from 2008–09 through 2017–18." Results across subjects and grade levels are standardized and summarized as "grade level(s) below the national average." The average score in the Cleveland Municipal School District over this period was 2.27 grades below the national average, while the average score in the St. Louis City School District was 2.14 grades below the national average. Adjusted for socioeconomic status, however, the St. Louis City schools appear to perform worse than the Cleveland Municipal schools. The SEDA reports were accessed here: Educational Opportunity Project at Stanford University, "Educational Opportunity in the U.S.," Edopportunity.org, 2024,
https://edopportunity.org/opportunity/explorer/#/split/none/districts/avg/ses/all/3.15/37.39/-96.78/.

retrenchment on labor costs. Finally, I discuss the challenge of financing debts linked to underfunded pensions and retiree health benefits.

i. The challenges of closing or maintaining underutilized facilities

The closure of schools, hospitals, police stations or fire precincts can be fraught. The political difficulty of decisions regarding when and where to close such facilities is not surprising, as closures impose costs on affected populations. School and hospital closures, for example, raise transit costs for those who live closest to shuttered facilities. In the case of schools, this cost increase reduces convenience, may complicate commutes, and disrupts students' social and counseling networks. In the case of hospitals, the health outcomes of those experiencing acute medical emergencies may be at stake. The closure of fire stations and police precincts may similarly worsen response times and may reduce first responders' familiarity with local circumstances. The efficacy of service delivery may suffer as a result.

That said, the costs of facility closures may not be as wide-ranging or long-lasting as one might be inclined to fear. Alexander and Richards (2023), for example, find that while hospital closures reduce employment through direct impacts on the health sector, those impacts do not spill over into other sectors. Research from the education context highlights that while school closures can and do disrupt student attendance, closures that shift students from underperforming schools toward higher-performing schools can mitigate adverse effects on test scores (Engberg et al. 2012). Additionally, while health facility closures increase time in transit, evidence of impacts on care quality is mixed; this ambiguity may reflect the mixed effects of being shifted toward higher-quality facilities while facing greater burdens in reaching such a facility (Mullens et al. 2024). The opportunity to close underperforming facilities can be cast as an opportunity amidst what most will recognize as a painful adjustment process.

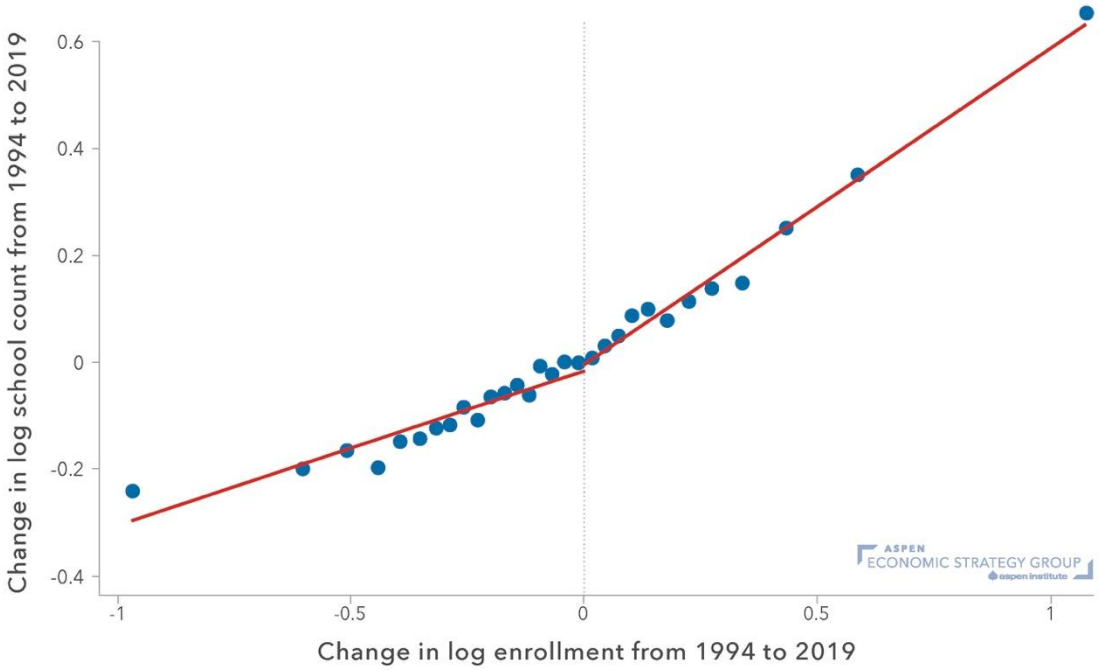
Nonetheless, declines in population imply reductions in service need and hence reductions in required capacity. For hospitals and schools, a declining constituent base translates quite directly into reductions in utilized capacity, and hence into rising costs per constituent served. While closing facilities may be costly to local residents and thus politically painful, these considerations must at some point give way to the problem of rising costs.

Data on school districts provide evidence regarding the relative ease of adapting the number of facilities to enrollment changes, as shown in figure 4. As before, I examine changes from 1994 to 2019 among school districts that report no changes to their boundaries. For ease of visual representation, the underlying data are once again grouped into 30 bins based on the magnitude of districts' enrollment changes. As one should expect, the data reveal that districts experiencing rising enrollments add to their number of schools while districts with declining enrollments subtract from their number of schools. The magnitude of these adjustments, however, is very different for expanding relative to contracting districts. In expanding districts, a 10 percent

increase in the number of students predicts a 6 percent increase in the number of schools, such that the number of students per school would rise moderately. In contracting districts, a 10 percent decline in the number of students predicts just a 3 percent decrease in the number of schools. Declining districts thus experience, on average, quite dramatic declines in the occupancy of their schools that remain in operation.

The Cleveland Metropolitan and St. Louis City school districts illustrate once again that there can be substantial differences between districts that experience similarly dramatic declines in enrollment. While the enrollments of both districts fell by just over half between 1999 and 2019, the extent to which they reduced their numbers of operating schools differed substantially. From 1999 to 2019, the Cleveland Metropolitan School District contracted from 124 to 104 schools (a decline of 16 percent), while the St. Louis City School District contracted from 115 to 74 schools in operation (a decline of 36 percent). The extent to which this difference in school closures contributed to the dramatic divergence in these districts' per-enrollee expenditures is an open question. Its impact on student outcomes is also a consideration of high importance.

Figure 4: Enrollment changes and changes in school counts among regular school districts with stable boundaries, 1994–2019



Source: Author's calculations using data from the Common Core of Data (2025) produced by the National Center for Education Statistics, as preprocessed by the Urban Institute and made available through its Education Data Portal. The underlying data on just under 9,000 school districts have been grouped into 30 bins based on the size of each district's change in enrollment. Each circle represents the means of the changes in log enrollment and the log of the number of schools in operation from 1994 to 2019 across the districts within each bin. Best-fit lines have been estimated separately on the underlying school-district observations for the districts with enrollment changes above versus below 0.

ii. The challenges of scaling back on transit and utilities infrastructure

Other forms of state and local government infrastructure pose related yet conceptually distinct challenges. Like underutilized schools and hospitals, for example, underutilized transit routes must eventually be shut down or, at minimum, receive less service. The maintenance of underutilized road and utilities infrastructure raises a basic question regarding the allocation of resources: How should states and localities allocate funding when the infrastructure in depopulating areas is used less and less over time? If baseline spending and maintenance schedules are maintained, then the cost per user will rise; if spending is reduced and resources are reallocated, then the remaining users in depopulating areas may suffer from diminishing access and quality of service.

A point of contrast, which is particularly salient for utilities, is that the home itself is the point of access for utilities including water and power. This observation points to a potentially important difference between utilities and roads on the one hand and, on the other hand, services like schooling and health care, which are typically provided at more-centralized facilities. Universal access to utilities and road networks requires that all homes be served and connected. Consequently, the social goal of universal access may require continued operation at heighted cost. The cases of utilities and roads contrast with the cases of schooling and health care, where universal access can, at least in principle, be maintained even while closing underutilized facilities. In light of the higher cost of delivering service to outlying and depopulating areas, an important question is whether the residents of such areas can be charged rates commensurate with cost. Some might regard differential pricing for essential utilities as unfair. That said, charging common prices in the face of differential costs subsidizes these areas' residents. As a result, common pricing raises costs by distorting residential location decisions in ways that prolong needed adjustments.

iii. The challenges of sticky staffing

Beyond the economic and logistical difficulties of managing infrastructure, scaling back faces challenges to retrenchment on labor costs. Collective bargaining agreements, which may limit adjustments to both the number of workers and their compensation, are an obvious potential source of such frictions. Even outside formal collective-bargaining arrangements, experienced teachers and other civil servants may enjoy tenure-like grants of job security. Together, these factors will lead teacher-to-student or public employee-to-constituent ratios to rise as enrollment or overall population declines. Additionally, the decline in job security associated with working in a contracting district may require schools to pay more in order to recruit and retain workers.

A recent analysis of school district budgets and staffing finds evidence consistent with a role for staffing frictions (Lee and Scafidi 2025). In districts with expanding enrollment, this study finds modest long-run changes in per-pupil staffing. By contrast, per-pupil staffing rises substantially,

even over a 20-year time horizon, with the extent of the enrollment declines that occur in contracting districts. The implied long-run increase in staffing ratios is particularly large for administrators relative to teachers. Pay per teacher and other staff member, by contrast, appears to move modestly with either increases or decreases in enrollment.

Inertia, or stickiness in the number of teachers and staff, underlies the rise in staffing ratios as enrollments decline. The implications of inertia point to a potential role for fiscal institutions in driving the associated rise in per-pupil expenditures. Directionally, having fewer students means less need for educational inputs, while having more students means more need. In an environment of declining enrollments, inertia in staffing will thus contribute mechanically to increases in per-pupil expenditures. Fiscal institutions may contribute to this outcome because the typical state or local government's balanced-budget requirements only force adjustments in the face of deficits, which would only emerge here if revenues decline (Poterba 1994; Clemens and Miran 2012). The structure of federal and state funding formulas is such that districts will only experience funding pressures with a lag.

Here again, the Cleveland Metropolitan and St. Louis City school districts provide an interesting study in contrasts. As these districts' enrollments halved, both maintained similar classroom size as inferred from the ratio of students to full-time-equivalent teachers. They differed substantially, however, with respect to other staffing. In the Cleveland Metropolitan School District, the ratios of instructional aides, administrators, and other support staff to teachers were much higher than in the St. Louis City School District in 2019 and beyond.[3]

The Cleveland Metropolitan and St. Louis City school districts also provide interesting data points regarding the potential importance of state and federal fiscal institutions. As reported in the Common Core of Data (2025), the spending of the Cleveland Metropolitan School District has continued to be supported considerably by state financing arrangements. By contrast, the data suggest that the state of Missouri has supported an increasingly small share of the St. Louis City School District's expenditures over the last two decades. Federal revenues also compose a substantially smaller share of revenues for the St. Louis City School District than for the Cleveland Metropolitan School District. Altogether, the local share of public school spending in St. Louis is substantially higher than in Cleveland.[4] The St. Louis City School District's greater

[3] The St. Louis City School District's low reported counts of district-level administrators and district-level support staff, as reported in the Common Core of Data, may be an artifact of the extended period, beginning in 2007, during which the Missouri State Board of Education controlled the St. Louis Public School District (Delaney 2019). Notably, this change in control arose due to a blend of financial mismanagement and accreditation issues. That said, relative to St. Louis, the Cleveland Municipal School District's staffing ratios are high for instructional aides, school-level administration, and other support staff, for which this explanation appears far less plausible.

[4] For the Common Core of Data's most recent snapshots, which are consistent with what I observe in the pre-pandemic data, Cleveland Municipal School District's data can be found at National Center for Education Statistics, "District Directory Information: Cleveland Municipal," NCES.ed.gov, 2025, https://nces.ed.gov/ccd/districtsearch/district_detail.asp?Search=2&DistrictID=3904378&ID2=3904378&details=4. The most recent snapshot for St. Louis City School District can be found at National Center for Education Statistics, "District Directory Information: St. Louis City," NCES.ed.gov, 2025,

reliance on local tax sources may have contributed to the extent to which its operations scaled back as its enrollments declined.

iv. The burden of underfunded pension and retiree health plans

Underfunded pensions and retiree health plans have the potential to pose substantial problems for jurisdictions that are experiencing population decline. Because retirees are no longer working, these costs pose a fiscal drag on ongoing service delivery when they are not pre-funded.

The extent of underfunded pension and retiree health benefit liabilities is difficult to measure. Uncertainty arises in part due to the nuances of discounting, which are central when assessing the current assets required to fund promised streams of future benefits. An important paper by Novy-Marx and Rauh (2011) emphasizes that public-pension accounting rules obscure the true magnitude of these obligations because they are conventionally discounted by the same rate as the assumed returns on pension assets. This flawed discounting methodology understates the value of future liabilities because, for reasons embedded in common law as well as in some states' constitutions, pension obligations have higher legal priority than states' other obligations. Novy-Marx and Rauh emphasize that because pensions will be paid with greater certainty, they should be discounted at lower rates. In 2009, Novy-Marx and Rauh estimated that accounting for this difference could add $1 trillion to the value of pension liabilities for state government employees alone.

How large are the unfunded liabilities of state and local governments' pension and retiree health plans currently? This question is difficult to answer with confidence. A recent report from Pew (Draine et al. 2025) estimates that pensions for state and local government workers were underfunded to the tune of $1.3 trillion in 2022. The latest data available to these authors valued the underfunded portion of retiree health plans at $680 billion in 2019. The accounting issues raised by Novy-Marx and Rauh imply that the present value of the underlying liabilities is likely understated. On the other hand, the stock market's substantial rise relative to the years in which these snapshots were taken may mean that net unfunded liabilities are much lower today.

One way the Pew reports convey the burden of restoring adequate funding is to express the required annual contribution as a share of a state's own-source revenue. Put differently, this figure describes the percentage increases in a state's revenue collections that would be required for the state to fully pay for the burden of its pension liabilities over time. Nationwide, in its latest available data, Pew estimated that underfunded pensions would require an average contribution equivalent to 4.9 percent of states' own-source revenues, and that underfunded

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https://nces.ed.gov/ccd/districtsearch/district_detail.asp?Search=2&DistrictID=2929280&ID2=2929280&details=4. Like the low reported numbers of district-level administrators and support staff members mentioned above, it is possible that the low state share of the St. Louis City School District's revenues is in part an artifact of the Missouri State Board of Education's extended period of control over the St. Louis City School District.

retiree health benefits would require an average contribution equivalent to 3.5 percent of states' own-source revenues.

States vary dramatically in the burden they associate with underfunded pensions and retiree health benefits. The states of Illinois and New Jersey are notable in that they ranked worst and next-to-worst in the estimated funding burden for both pension and retiree health benefits. For 2019 retiree health benefits, for example, Pew estimates that New Jersey's underfunded liabilities required a $6.4 billion annual contribution, amounting to 12.2 percent of a year's own-source revenue. The equivalent figures for Illinois were $5.0 billion and 9.3 percent. For 2022 pension benefits, Pew estimated Illinois's underfunded liability as requiring a contribution equivalent to 15.3 percent of a year's own-source revenue, such that between pension and health benefits the required contribution is almost 25 percent of a year's own-source revenue. The equivalent figure for New Jersey's unfunded pension debts is 11.5 percent, such that between pension and health benefits, the required contribution is almost 22.7 of a year's own-source revenue. The average nationwide was 8.4 percent, and for a number of states, the combined total is less than 4 percent.

An economically important dimension of underfunded retiree benefits is that it is a genuinely fixed cost, the absolute value of which does not change with the size of a state's population or tax base. Consequently, as the population or tax base declines, the burden of these underfunded benefits on remaining taxpayers rises. These costs thus have the potential to give rise to adverse feedback loops. That is, if a rise in the burden faced by remaining taxpayers results in additional taxpayer exit, a further increase in the burden per taxpayer ensues, which can induce yet more taxpayer exit. Notably, a qualitative analysis of eight relatively recent municipal bankruptcies linked six of the eight to "structural fiscal deficits" involving "population and economic decline" alongside "growing expenditures (pension and healthcare) and unfunded pension liability" (Davidson 2020). It is both unsurprising and rather concerning, in this context, to see Illinois emerge as a state with large unfunded liabilities and a decade of population decline.

Conclusion

Between migration patterns and persistently low fertility, many states and localities are on course to experience substantial declines in population over the coming years. This paper has discussed a set of challenges these developments will bring to the efficiency of service provision by state and local governments. School districts, many of which have already faced substantial enrollment declines over the last quarter-century, provide leading indicators regarding the nature of these challenges.

Both school districts and the subnational public sector as a whole exhibit evidence of economies of scale over the long run. In both settings, 10 percent more population growth has predicted just over 2 percent slower growth in per-capita expenditures historically. Because many school

districts have experienced population decline, their experience sheds light on the asymmetric effect of population contraction relative to growth; in the data presented above, the per-enrollee cost increases associated with 10 percent greater enrollment decline were four times larger than the cost decreases associated with 10 percent greater enrollment increase. Evidence points to the difficulty of closing underutilized facilities, frictions to retrenchment on labor costs, and the burdens of underfunded pension and retiree health liabilities as important challenges to jurisdictions undergoing population decline.

The impacts of low fertility on elementary and secondary schools continue to unfold, while impacts on institutions of higher learning are on the horizon. Against this backdrop, a difference between fertility- and migration-driven declines in population merits emphasis. Declines in migration simultaneously impact both the need for public services and the tax base through which those services are financed. The resulting decline in revenues forces the issue with respect to retrenchment on service provision. This forcing mechanism is absent when declines in fertility reduce the need for education and other child-oriented public services. This reduced need, in turn, raises the risk of inertial, inefficiently slow retrenchment. Over the long run, however, low fertility implies declines in the number of workers per retiree, which will exacerbate our fiscal challenges. In light of these long-run challenges, the United States can ill afford to squander low fertility's short-run fiscal dividend. Efficient retrenchment in the face of declining need for education and other services should be a priority.

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Demographic Headwinds

The Economic Consequences of Lower Birth Rates and Longer Lives

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CHAPTER

The Environmental Benefits of Low Fertility and Population Decline are Overstated

by Kevin Kuruc

FEBRUARY 2026

The Environmental Benefits of Low Fertility are Overstated

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AUTHOR

Kevin Kuruc*

SUMMARY

The discussion of impending population decline is often dismissed or minimized by arguments that downplay its urgency – or even welcome this development – because of the proposed environmental benefits. This paper argues that the environmental benefits of depopulation are far smaller than widely believed, and that complacency about population decline may be counterproductive to climate goals. First, there is a fundamental issue of timing mismatch. Demographic change unfolds over generations, while effective responses to emissions and environmental harm require immediate action. Second, effective climate strategies, such as carbon capture, require high fixed capital and labor costs. The smaller the economy, the larger the share of national income required to achieve climate goals. Beyond the climate, there is little evidence to suggest that increases in per-capita resource availability from depopulation would materially improve living standards, as modern natural-resource constraints on well-being are limited and declining. In contrast, sustainability depends on policy, human ingenuity, and fiscal capacity, none of which are aided by a shrinking and aging population. Taken together, this paper argues that effective sustainability policy will require sustained public investment and proactive policy.

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Introduction

A common reaction to the prospect of a declining population is relief. The thinking behind that reaction is that the land can support only so many people, and the atmosphere can safely hold only so many greenhouse gases. Fewer people means less stress on natural systems, which reduces the chance of environmental calamity and allows us more space and resources per person.

This essay argues that this line of reasoning is dramatically overstated. The direct environmental benefits of a smaller population would be negligible. More than that, once indirect effects are considered, it becomes plausible that a smaller population could *harm* many environmental objectives. On net, there appears to be little environmental justification for preferring a smaller population.

The first section of the paper focuses on the direct effects of population decline. Using standard environmental economics models, I consider how environmental outcomes and per-person living standards would be affected by the population being smaller. I conclude that neither is likely to be improved in any important sense.

I begin with greenhouse gas emissions and ask whether declining birth rates can be expected to meaningfully reduce emissions. The answer is no, because of timing—population sizes change over *generations*, while progress toward a low-carbon economy will ideally happen over the coming *decades*. Section 1 details the demographic facts of this argument, making it clear that fertility rates today will have little-to-no effect on emissions this century.

Section 1 also considers the economy's reliance on natural resources. When natural resources constrain production, population growth may lower living standards. Economists have recognized and debated this issue since at least the late 1700s, when Thomas Malthus wrote his treatise on population growth. However, as I describe in detail, the best available evidence suggests that—in our modern economy—the availability of natural resources is not an important factor in determining human living standards around the world, especially not in the United States and other developed economies.

This first section can stand alone in showing that any positive environmental effects of population decline are small—small enough that they may be safely ignored in policy debates about fertility in developed countries.

The second section considers indirect channels through which population size might affect environmental outcomes. Indirect effects are more difficult to measure, so this discussion is necessarily speculative, but the broad claim is that the conclusion of section 1 holds. This is because these indirect effects point in both directions, making it unclear whether they add to the case against people at all.

For example, the institutions, political coalitions, and technologies that can solve our environmental challenges do not fall from the sky. People build them. Our collective ability to find and deploy solutions is increased when there are more people, not fewer.

Worse, population decline inverts the age pyramid. If fertility remains below the replacement rate, each successive generation will be smaller than the last. As a result, older generations will make up a larger share of the voting population than they do at present. An aging electorate will likely make it harder to build political coalitions for long-term sustainability.

The arguments in this paper do not deny that a smaller population could help in some respects. But much is at stake when considering the prospect of sustained low fertility and enduring population decline. The evidence that a smaller population would meaningfully benefit living standards through environmental channels is not as strong as many people's long-standing intuitions on this issue. It is certainly not strong enough to justify complacency about a depopulating United States or world.

1. The potential environmental benefits of a smaller population are small, and they are insignificant for living standards.

This section demonstrates that the direct environmental benefits of depopulation are small. Depopulation will not do much to address climate change, nor the general scarcity of natural resources used in production.

a) Emissions mitigation timelines are too short for fertility to matter.

Climate change is the environmental challenge that generates the most public concern. Any argument for why population decline will not be an environmental benefit must start here.

The reason that low fertility will not reduce long-run climate change is simple: timing. The timelines over which the world is aiming to substantially curtail emissions do not line up with the timelines over which fertility impacts the size of the population. It is too late for changes in fertility to make a large difference in population sizes this century, and by the end of this century, it will be too late for population changes to make a large difference to eventual warming.

Before considering any demographic details, consider this simple fact, which illustrates the problem over the medium-term:

> *A large majority of the people who will be alive in 2050—a focal year in climate discussions—have already been born.*

Demographic projections expect that about 75 percent of the United States population in 2050 will be over the age of 24, and hence, born prior to 2026 (United Nations 2024). Even an immediate change in fertility can only affect the 25 percent of the population pyramid that has not yet been born, implying that, for example, a 10 percent decline in births would produce only

a 2.5 percent decline in the size of the overall 2050 population. Moreover, these missing individuals would be mostly children—too young to have entered the workforce, when their income, consumption, and emissions peak. So, any realistic decline in near-term births would have a trivial impact on mid-century emissions.

Research that carefully models the dynamic interplay between population and emissions finds a very small effect of fertility changes on longer-run climate change. In Budolfson et al. (2025), my co-authors and I simulate the effects of a large and immediate change in fertility rates under various emissions trajectories. We compare climate outcomes out to 2200 under the United Nations' baseline path for global population against a hypothetical alternative in which every country with below-replacement fertility immediately and permanently sees an increase in fertility rates to the replacement rate (about two children per woman). Such a change in fertility rates is unrealistically large and immediate, meant to demonstrate the largest plausible effects that fertility can have on climate.

Simulating this fertility increase through leading demographic models reveals that it takes nearly a century for the population size to increase by an appreciable level, as displayed in figure 1. By 2100, for example, the world population would be only 17 percent larger. In each year prior, the difference is smaller.

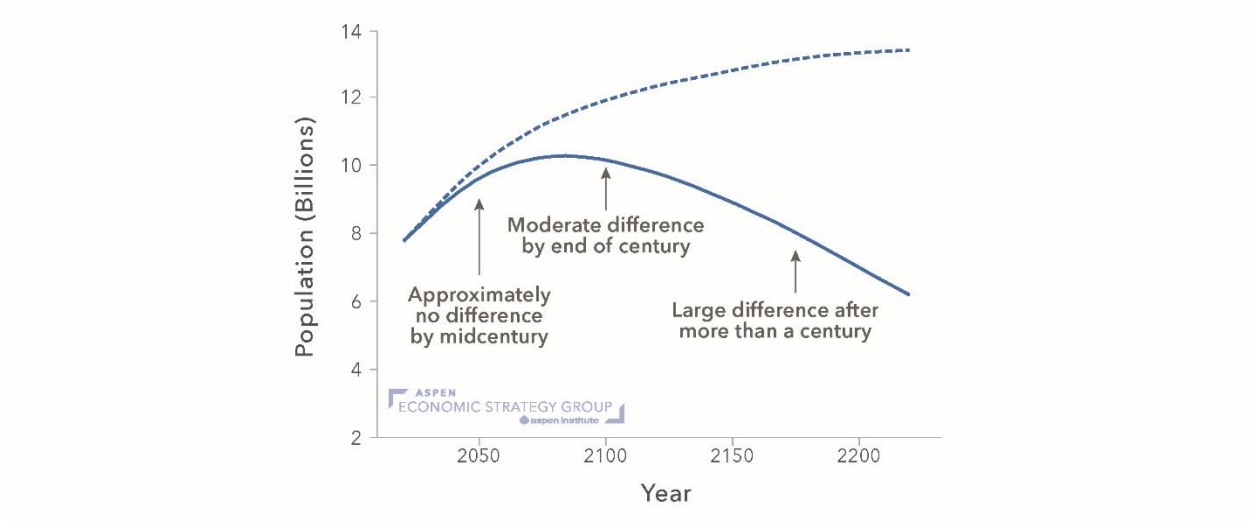
These relatively small changes in population size this century would have small effects on climate outcomes. What may be surprising is just how small: This hypothetical (and very large) change in fertility leads to a difference in warming of less than 0.1 degree Celsius by 2200. This result is not driven by assuming that emissions will fall rapidly—such an assumption would render climate change nearly solved and any additional mitigation efforts inconsequential. Instead, the baseline emissions scenario that this result comes from is pessimistic. Humanity continues emitting at substantial rates through 2100, and the world sees nearly 3.5 degrees of warming by then, a more pessimistic outcome than current projections anticipate (Hausfather and Peters 2020; Arkolakis and Walsh 2023; Ritchie 2024).

In scenarios where humanity continues emitting throughout the entire 22nd century, population change can make a larger difference—we estimate up to one-third of a degree in worst-case emissions scenarios. But the sustained emissions in these scenarios push warming to six degrees *even in the small population future*.[1] These are emissions trajectories humanity must avoid regardless of fertility dynamics; an additional one-third of a degree would likely be inconsequential in a future of six degrees of warming.

The slow speed of population change means that the case for the environmental benefits of low fertility cannot rest on transitory concerns like climate mitigation.[2]

[1] Thankfully, these futures are increasingly unlikely, as renewables have continued to see incredible cost declines (see again Arkolakis and Walsh 2023, Ritchie 2024).
[2] See also Bradshaw and Brook (2014).

Figure 1: Fertility affects total population size with a long lag



Note: Population scenarios as computed in Budolfson et al (2025). Solid line represents a baseline scenario of global depopulation, dotted line represents large, immediate hypothetical change in fertility.

b) Scarce natural resources are not an important factor for living standards in modern economies.

An enduring feature of the global economy is that some resources are in fixed supply and must be spread more thinly across people if the population is larger. Thomas Malthus was concerned with this problem in 1798, when he published his *Essay on the Principle of Population*; Paul Ehrlich was concerned about it in 1968, when he published *The Population Bomb*; and many remain concerned about it today (see, e.g., Dasgupta 2021; Club of Rome 2022).

This section argues that these effects are also likely to be small for population sizes near or below our own.[3] Historically, limited natural resources have not prevented the escape from deep material poverty that defined much of human history—even as the global population exploded. Moreover, natural resources appear to be ever less important as a source of wealth and economic security as development continues. These historical patterns do not guarantee future outcomes, but they provide a useful starting point for assessing whether natural resources are currently constraining economic well-being.

This issue can be analyzed in formal economic models by following a long-standing practice that uses prices as a signal of the relative importance of goods, services, or resources. Building on Weil and Wilde (2009), Maya Eden and I show that the economic importance of fixed natural resources can be summarized by the share of total global income paid to owners of these resources (Eden and Kuruc 2023).

[3] It would be questionable to extend the arguments to speak in favor of a global population much larger than our own. It is more difficult to know whether any resources might become constraints at much larger population sizes.

To see why the share of global income accruing to natural resources is the right metric, consider an extreme scenario where the average person is near starving and scarce farmland is the constraint on food production. Because food is scarce, food prices would be bid up to a high percentage of the average individual's income. We would each be willing to pay nearly all we had in order to eat. This scenario would induce markets and stores to bid up the prices they pay to farmers for food, because food would be so profitable to stock. As a result, farmers would then be willing to pay high prices to purchase or lease more land, because growing food would have become so profitable. The chain bottoms out here: Once the scarce land is acquired, the bottleneck will be relieved. A large share of humanity's collective income thus flows from households through supply chains and is eventually earned by the owners of the scarce farmland.

In the modern world, by contrast, food is abundant and easy to grow. This state of affairs keeps prices low—competition from those who can and do expand production prevents prices from rising. As a result, there is much less to be gained from owning more farmland, which keeps the price of farmland itself low as a fraction of the economy's total income.

This logic generalizes to all scarce natural resources. We can approximate how much richer each person would be, on average, from an increase in per-person resource availability by studying the collective earnings of all natural resources.[4] Empirically, total natural-resource-related earnings are small. At the global level over the last 50 years, between 2.5 and 7.5 percent of humanity's collective income was paid to owners of natural resources (Eden and Kuruc 2023).

In developed countries like the United States, these resources matter even less. The present-day US sees less than 1 percent of its collective income paid to natural resource owners. We no longer live in a world where natural resources are a crucial constraint for a large share of industries.

Increasing per-person resource availability would therefore do very little for per-person income. The theory in Eden and Kuruc (2023) and Weil and Wilde (2009), paired with data on global natural-resource income shares, provides a rough estimate that a 1 percent decline in the global population size would lead to a 0.05 percent increase in per-person incomes through this channel. This benefit would be even lower in developed economies, where the population would need to decline by well over 25 percent to raise per person income by even 1 percent.

Overall, the direct effects of population decline on living standards through environmental channels will be insignificant. It is too late for fertility to affect climate outcomes this century, and the scarce natural resources that would be enduringly more abundant per person do not play much of a role in the wealth of modern economies.

[4] Note that this value counts the earnings of natural resources, not just the value of those purchased (or rented) in a given year. Farmland is rarely traded, but we can still estimate the earnings accruing to the owners of this resource and infer that this amount is the value of owning the resource.

2. Low fertility may be harmful for solving or adapting to our environmental challenges.

The previous section showed that depopulation's direct benefits are negligible. What about the indirect effects of low fertility: Could there be benefits not captured by the models used above? The evidence on this question is thinner, but I argue that indirect effects could push in either direction, and thus they fail to rescue the environmental case for depopulation.

The logic that this claim relies on is straightforward: Solving and adapting to our biggest environmental challenges requires human effort and resolve. A shrinking population may have less of each.

a) Many adaptation strategies take collective effort, which is made more difficult per person with a smaller population.

A smaller, shrinking population will have fewer human resources to solve collective problems. Consider the case of a US coastal city building and maintaining levees to cope with rising sea levels. The cost of building this infrastructure is not affected by the number of Americans who are alive in any given year. They are *fixed costs*—building a sea wall costs the same whether the US population is 100 million or one billion.

Projects with significant fixed costs are cheaper per person when the population is larger. Many hands make light work—and many taxpayers mean lower taxes per person for any given project. There are a range of potential infrastructure-related climate adaptations that could make climate change less harmful. Those projects are less economically and politically feasible when there are fewer individuals to contribute (see Clemens 2026 in this volume for a broader analysis of the public finance implications of low fertility).

Direct removal of greenhouse gases is another fixed-cost problem that becomes more difficult with fewer people. The United States has begun operating industrial direct air capture facilities that remove carbon from the atmosphere through chemical reactions. Removing the greenhouse gases that have already pushed the world to 1.5 degrees of warming will require a certain fixed amount of capital and labor. The smaller the economy, the larger the share of it that must be dedicated to accomplishing any climate goal best achieved through effortful carbon dioxide removal (see again, Budolfson et al. 2025).

Section 1a showed that emissions reductions from low fertility would be trivial. But many climate solutions additionally require fixed-cost investments. Low fertility may therefore make climate damage worse, not better.

b) Sustainability is a result of policy choices—and a shrinking and aging population may be less likely to make these choices.

A different claim is that a smaller population would be less likely to use resources unsustainably or irresponsibly.[5] While this claim sounds plausible, it is difficult to see why it would be true. Sustainability is (or is not) a result of policy choices—rules and institutions that manage resource use. A shrinking, aging population may be less likely to design, vote for, and enforce these rules.

Natural-resource overuse is a commons problem: Individuals gain privately from extraction but share the costs of depletion collectively. Each actor is incentivized to grab what they can, and the expectation that others will do the same makes overextraction self-fulfilling. The solution, both in theory and historical experience, is rules that restrict use—not fewer users.

Rules are necessary because even small populations overexploit resources in their absence. For example, the leading theory of great mammalian extinctions holds that extremely tiny bands of early humans hunted megafauna to extinction as humans spread across continents (Ritchie 2024). Conversely, large populations have cleaned their air and water when governments wrote and enforced rules requiring it (Spears and Geruso 2025). Population size appears to play no direct role in whether commons problems get solved.

While population size plays an unimportant role conditional on the policy environment, it could play an indirect role through its effect on policy. Perhaps a smaller population would be more likely to prioritize, pass, and enforce sustainability policy. This possibility is difficult to even speculate on, but there is little evidence for the claim—and good reason to believe the opposite.

First, shrinking populations are likely to be poorer, both in total and per capita (Jones 2022; Peters 2022; Spears and Geruso 2025). This point matters because wealthier societies dedicate larger shares of their resources to nonmaterial goods like environmental quality and individual health (Grossman and Krueger 1995; Hall and Jones 2007). To the extent that smaller populations are poorer, we should expect that they will be more focused on material needs and less willing to invest in sustainability than they would be if they were larger.

Second, low-fertility populations are older populations. Each generation is smaller than the last, inverting the population pyramid. Moreover, the young are systematically more likely to report concern about the environment (e.g., Pew Research Center 2021). This pattern is not coincidental: Younger people have more to lose from long-term degradation and would be rational to place greater weight on benefits that accrue over longer time horizons. It is very difficult to imagine that an aging electorate is as likely to prioritize sustainability policies, whose payoffs can lie decades in the future.

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[5] This claim sits in contrast to the claim examined in section 1, where the economy was assumed to use the same level of resources regardless of population size (and the benefit was that each person got access to more of this fixed quantity).

This indirect reasoning is speculative, and there are countervailing forces that point in favor of smaller populations. For example, any extraction limits on natural resources are less burdensome per person when the population is smaller. If there is some total number of fish that can be sustainably fished each year, the per-person allocation would be higher in a smaller world. This difference may make sustainability rules more politically feasible since each voter sacrifices less. That said, the theoretical and empirical reasons to believe that an aging, shrinking population is less likely to pursue sustainability policy means that it cannot be assumed that these indirect effects would work to reverse the conclusion of section 1.

3. Conclusion

Declining populations will have many costs and benefits. These debates typically weigh the economic costs of a shrinking population against the environmental benefits. This essay argues that these environmental benefits are small, at best.

1. The emissions benefits of current levels of fertility are small—demographic forces unfold too slowly to help with the environmental problems of this century.
2. Natural-resource constraints on human well-being appear weak and ever less important. Increasing the availability of these resources per person via population decline is unlikely to make a noticeable difference to living standards.
3. Many adaptation and mitigation strategies to climate change and other environmental challenges will require human ingenuity (and taxes). These solutions will be harder to resource on a per-person basis if populations decline.
4. And, finally, smaller and older populations are less likely to have the political resolve to pass the sustainability policies that must be at the center of any path toward an environmentally healthy and abundant future.

This argument is far from the final word in the long debate about the relationship between population size and environmental outcomes. But these convergent lines of reasoning should cast serious doubt on the claim that there are obvious and consequential environmental benefits of low fertility. In cases where they can be measured and estimated, they seem small; in cases where more speculative arguments are marshalled, they can be marshalled in either direction. At present, it appears unscientific to welcome population decline on account of environmental benefits that very well may not arrive.

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