

SESSION 709

The Macroeconomics of Aging

Antitrust Policy

Professional societies, including the Conference of Consulting Actuaries (CCA), are subject to federal and state antitrust laws, and must constantly monitor their activities to ensure continued compliance with all antitrust regulations.

Purpose of Antitrust Laws

The antitrust laws prohibit any concerted activity or combination of competitors from interfering with free competition. In other words, the primary thrust of the law is to control private economic power by protecting competition. Persons and organizations are prohibited from engaging in any action which unreasonably restrains commerce or trade (i.e., competition). Per se violations (practices presumed to be inherently wrong regardless of the motivating factors) include: agreements to fix or stabilize prices, to divide markets, to allocate production, or to impose boycotts. In essence, this means any concerted action that significantly diminishes rivalry among competing firms.

Speakers



Lena Black, FCA, FSA, PhD
Terry Group



Jerry Mingione, FCA, FSA, CERA
Terry Group



Richard Jackson, PhD
Global Aging Institute

Agenda

- U.S. and global demographics – trends and projections
- Aging demographics → low expectation for economic growth
- Impacts on savings/investment/capital markets
- Rising fiscal demands on government – Social Security/Medicare-Medicaid
- Impact on retirement benefit programs and individuals saving for retirement
- Potential societal responses – what might mitigate the effects
 - ❑ extended work/delayed retirement
 - ❑ productivity-enhancing investment
 - ❑ higher immigration
 - ❑ entitlement reform
 - ❑ global trade and capital flows

Demographics Giveth and Then Taketh Away

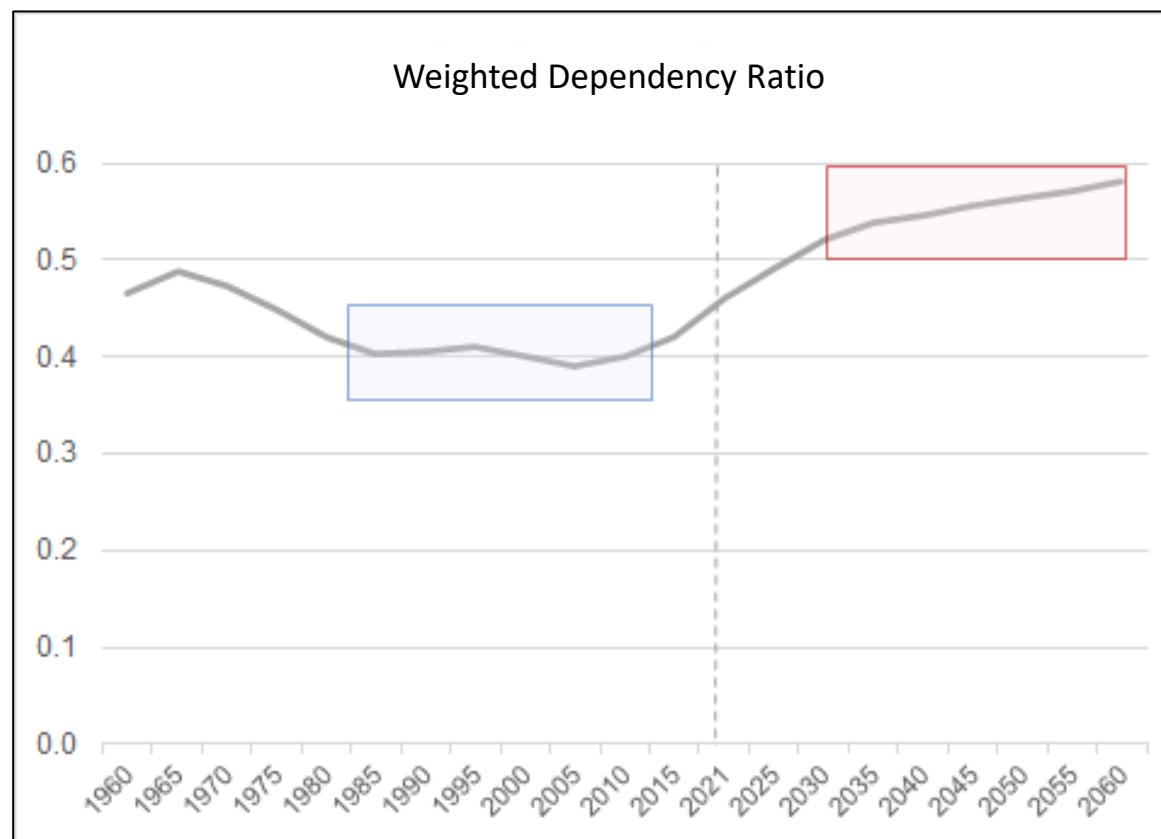
- During the baby boomers' working lifetimes the American economy experienced a **demographic tailwind**
 - the number of children was relatively low, i.e., reduced fertility
 - the number of retirees was relatively low, i.e., the WW II generation
 - the working age population grew rapidly.
- As baby boomers retire, the demographic effect turns into a **demographic headwind**
 - the number of children remains low
 - but the number of retirees explodes, due to a combination of:
 - baby boomer numbers
 - expanding life expectancy
 - (perhaps) stubborn adherence to a fixed work/retirement age boundary.

We are now in a “transition period” between these two historic extremes...

Demographics in Transition between Historic Extremes

	Actual/Projected 2022				Weighted Dependency Ratio
	Overall Popn.	<20	20-64	65+	
1960	190	73	100	17	0.47
1965	204	80	105	19	0.49
1970	215	81	113	21	0.47
1975	225	79	123	23	0.45
1980	235	75	134	26	0.42
1985	247	73	145	29	0.40
1990	259	75	153	32	0.40
1995	274	79	161	34	0.41
2000	288	82	170	36	0.40
2005	302	84	181	37	0.39
2010	315	86	188	41	0.40
2015	326	85	193	48	0.42
2021	335	83	195	57	0.46
2025	344	83	197	64	0.49
2030	355	83	201	71	0.52
2035	365	85	204	76	0.54
2040	375	89	208	78	0.55
2045	383	93	210	80	0.56
2050	391	96	214	82	0.56
2055	399	97	217	85	0.57
2060	407	98	221	89	0.58

Dependency Ratio is based on the sum of presumed dependents (a) 65+ plus (b) <20 population (wtd 40%) divided by the presumed worker group 20-64.



Source: Social Security Annual Trustees Reports

Demographics Can Have a Dominant Macro-Economic Impact

Features of Demographic Tailwind

- High rate of economic growth (earlier phase)
- High level of savings, as many are saving for later retirement
- Low equilibrium interest rate (later phase)
- High capital market pricing (later phase)
- Low inflation (especially later phase)
- Monetary policy enabled
 - but limited effectiveness since a large chunk of the newly issued funds will not be spent (aka “pushing on a string”)

Features of Demographic Headwind

- Low rate of economic growth
- Tendency towards “dissaving” as retirees live off accumulated capital (could be deferred some)
- Increased equilibrium interest rate
- Reduced capital market pricing
- Tendency toward inflation, as accumulated capital chases limited economic goods
- Monetary policy disabled due to inflation concerns

Investment return will likely be on the low side...

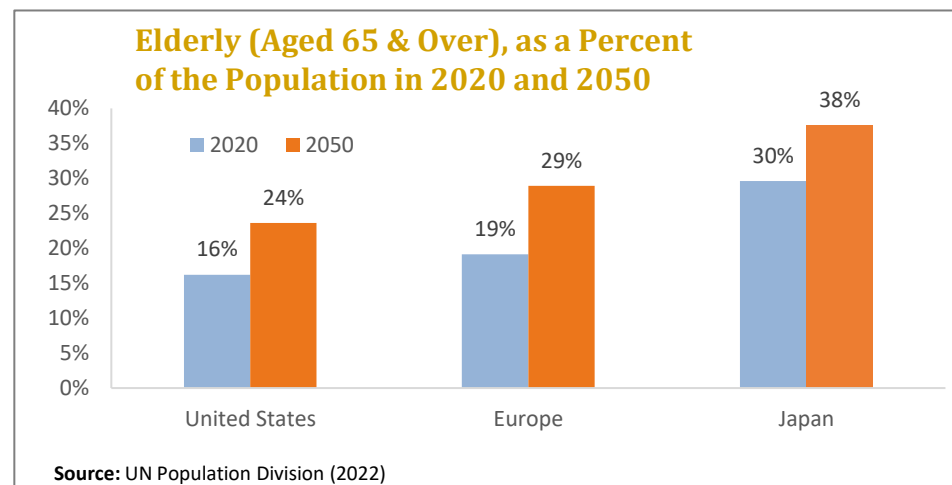
The Demographic & Economic Outlook

Shades of Gray

- ❑ There are two forces behind the aging of the population: falling fertility and rising life expectancy.
- ❑ The extent of population aging varies greatly across the developed world, mainly because fertility rates have fallen much further in some countries than in others.
- ❑ Until recently, America's relatively high fertility rate, together with substantial net immigration, seemed to ensure that it would remain the youngest of the major developed countries for the foreseeable future. Since the Great Recession, however, the U.S. fertility rate has fallen sharply, while net immigration has also declined.
- ❑ The latest UN projections still show that America will age significantly less than most European countries and much less than Japan. Yet its demographic advantage over its developed world peers has narrowed considerably compared with previous UN projections.

	Life Expectancy at Birth				Total Fertility Rate			
	1960	1980	2000	2021	1960	1980	2000	2021
Canada	71	75	79	83	3.9	1.7	1.5	1.5
France	70	74	79	82	2.7	2.0	1.9	1.8
Germany	69	73	78	81	2.4	1.5	1.4	1.5
Italy	69	74	80	83	2.4	1.6	1.3	1.3
Japan	68	76	81	85	2.0	1.7	1.4	1.3
UK	71	74	78	81	2.7	1.9	1.6	1.6
US*	70	74	77	76	3.6	1.8	2.0	1.7

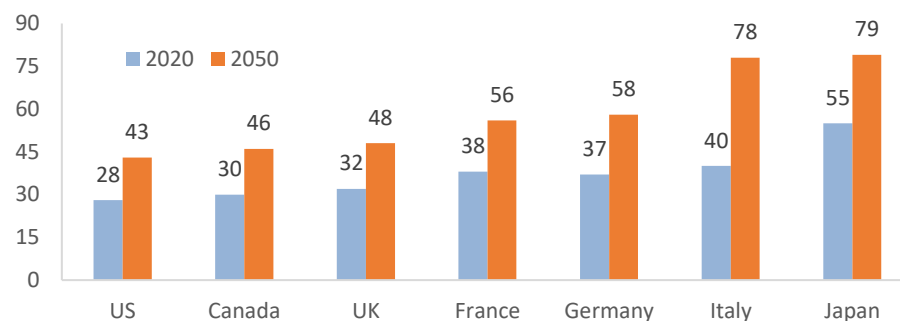
Source: UN Population Division (2022) * U.S. data for 2021 are from CDC



The Impact on Dependency Burdens

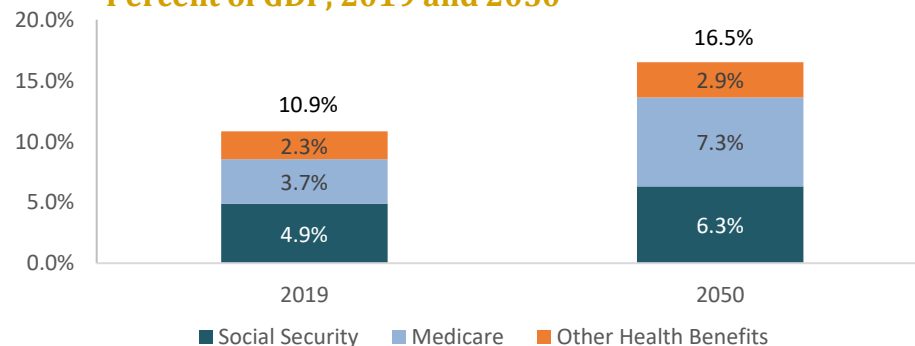
- Over time, lower fertility and higher life expectancy translate into a higher aged dependency ratio, which in turn translates into a higher cost rate for pay-as-you-go benefit programs like Social Security and Medicare.
- Higher old-age dependency costs may be partially offset by lower youth dependency costs. However, the youth dependency ratio is projected to fall much less than the aged dependency ratio is projected to rise, the old consume more per capita than the young, and most countries have socialized the cost of being old to a much greater extent than the cost of being young.

Aged Dependency Ratio (Elderly Aged 65 & Over per 100 Adults Aged 20-64), by Country, in 2020 and 2050



Source: UN Population Division (2022)

Federal Spending on Major Entitlement Programs, as a Percent of GDP, 2019 and 2050



Source: CBO (January 2020 and July 2022)

The Impact on Economic Growth

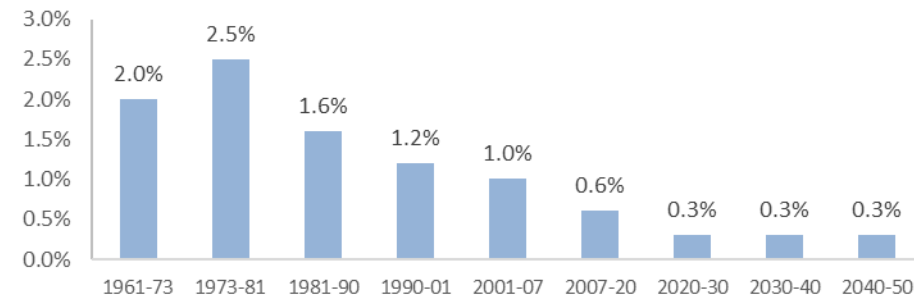
- Over time, lower fertility also translates into slower growth in the working-age population, which in turn translates into slower growth in employment and GDP.
- In coming decades, real U.S. GDP is projected to grow at just half of its postwar average. Japan and some European countries may face “secular stagnation”—that is, zero growth in real GDP across the business cycle.

Average Annual Growth Rate in the Working-Age Population (Aged 20-64), by Decade

	1980s	1990s	2000s	2010s	2020s	2030s	2040s
Canada	1.7%	1.1%	1.3%	0.7%	0.2%	0.5%	0.3%
France	1.0%	0.4%	0.6%	-0.3%	-0.2%	-0.2%	-0.3%
Germany	1.1%	0.3%	-0.5%	0.1%	-0.9%	-0.6%	-0.4%
Italy	0.9%	0.2%	0.2%	-0.3%	-0.8%	-1.4%	-1.1%
Japan	0.7%	0.4%	-0.4%	-1.0%	-0.6%	-1.3%	-1.2%
UK	0.7%	0.4%	0.7%	0.4%	0.0%	0.1%	-0.1%
US	1.3%	1.2%	1.1%	0.6%	0.2%	0.2%	0.1%

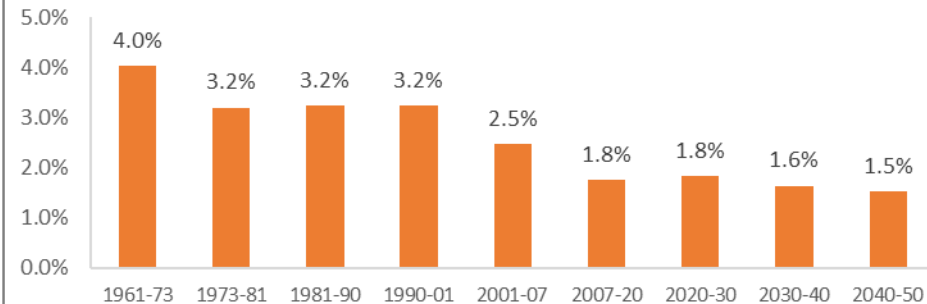
Source: UN Population Division (2022)

Average Annual Growth Rate in the U.S. Labor Force, by Period, 1961-2050



Source: CBO (July 2021 and July 2022)

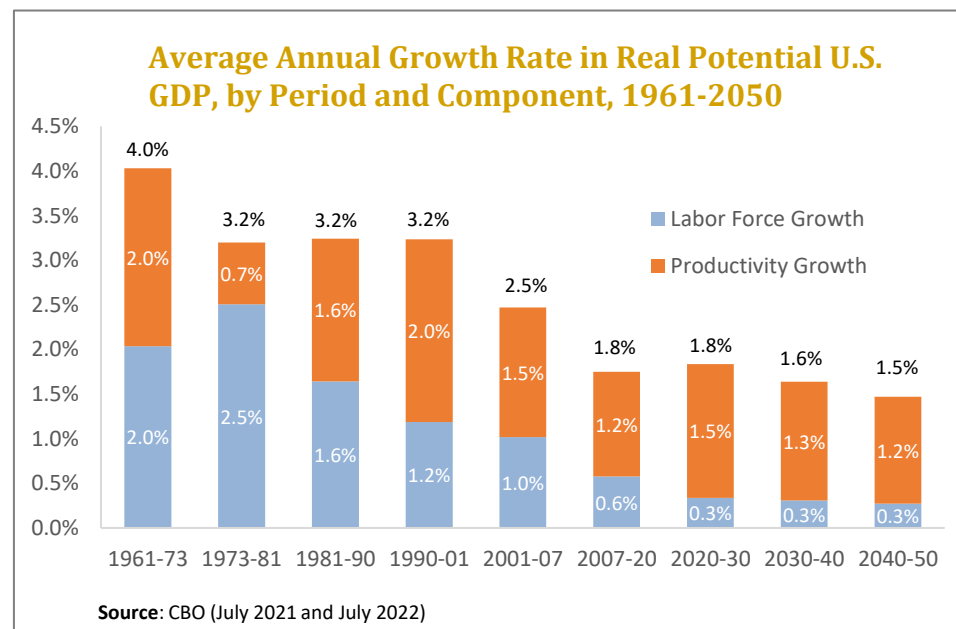
Average Annual Growth Rate in Real Potential U.S. GDP, by Period, 1961-2050



Source: CBO (July 2021 and July 2022)

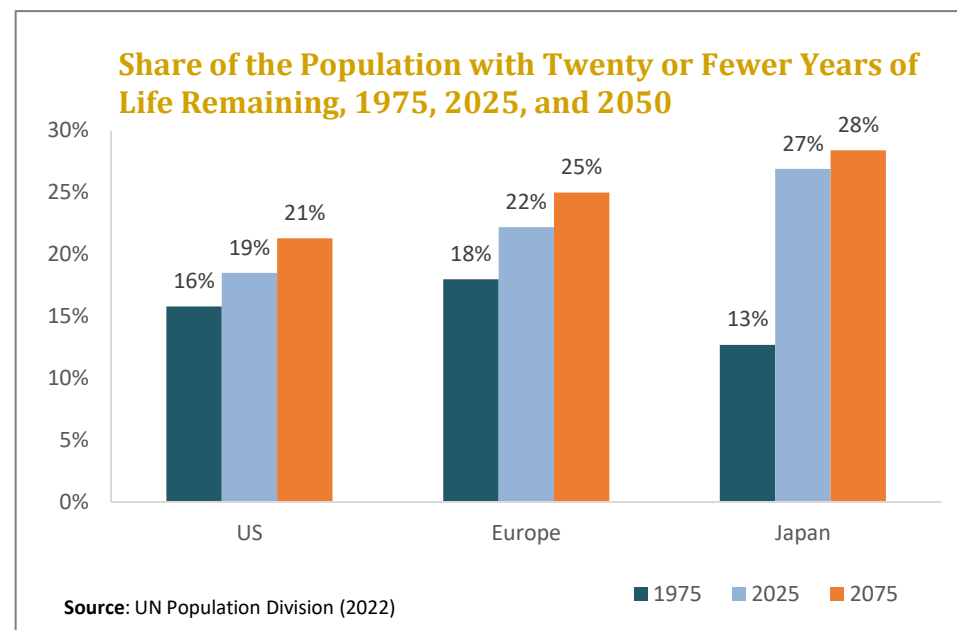
Why Productivity May Lag

- ❑ As employment growth slows, economic growth will increasingly depend on productivity gains. Yet population aging may also put downward pressure on productivity.
- ❑ A more slowly growing workforce likely entails less demand for capital-broadening investment, less innovation, and a slower turnover in the capital stock.
- ❑ As the average age of the workforce rises, it may become less flexible, less mobile, and less entrepreneurial.
- ❑ The U.S. economy will be increasingly dominated by service industries that are resistant to productivity improvements (“Baumol’s Cost Disease”).
- ❑ Rising fiscal burdens could lead to “crowding out” in capital markets and/or government budgets.



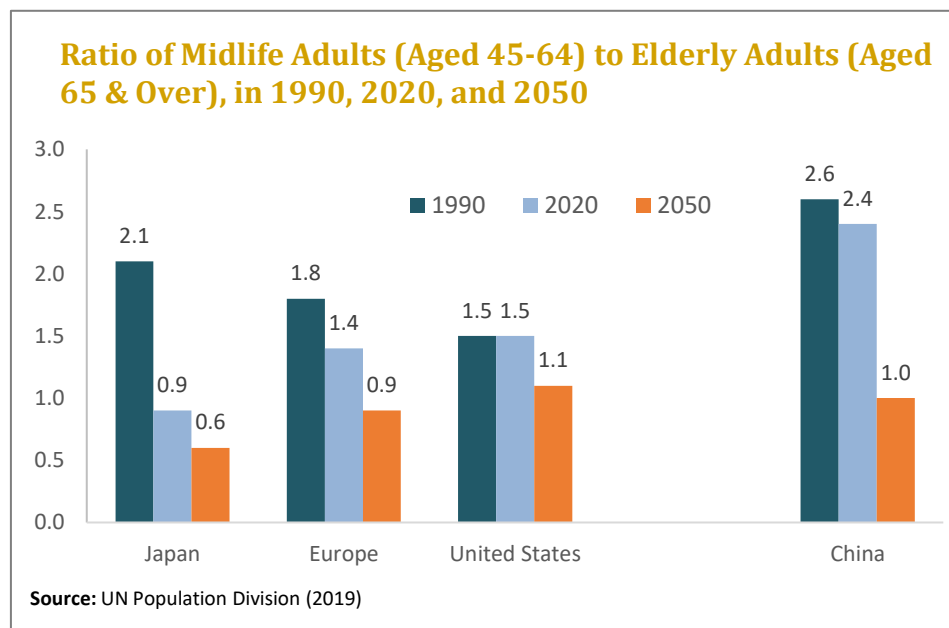
The Psychology of Slow Growth

- ❑ Along with the economic dynamics of slow growth, there may also be psychological dynamics that put further downward pressure on economic growth.
- ❑ With the size of domestic markets growing more slowly or even contracting, we may see more cartel behavior to protect market share and more restrictive rules on hiring and firing to protect jobs. We may also see increasing pressure on governments to block foreign competition.
- ❑ Shifts in business and market psychology could be mirrored by broader shifts in social mood. Slow-growth, aging societies may become more risk averse, have shorter time horizons, and be less willing to make investments with long-term payoffs.
- ❑ A robust statistical literature establishes that extremely youthful societies are often dysfunctional. Extremely aged societies may also prove dysfunctional in some ways, favoring consumption over investment, the past over the future, and the old over the young.



The Savings Puzzle

- ❑ Standard economic theory (Modigliani's "Lifecycle Consumption Hypothesis") assumes that people smooth consumption across their lifecycle. They borrow when young in order to launch careers and establish independent households, become large net savers in midlife, then draw down their savings in retirement.
- ❑ To date, there is little evidence of dissaving by the elderly. Although the United States along with much of the world is already aging, the world is still awash in excess savings.
- ❑ The reasons why savings has failed to fall may include:
 - Government old-age benefits
 - Rising life expectancy
 - Delayed retirement
 - Growing income inequality
- ❑ As large postwar baby boom generations more fully enter retirement, however, it is possible that many countries will reach a tipping point where savings rates finally fall.



What Happens to Interest Rates and Inflation?

Interest Rates

- ❑ According to the neoclassical growth model, slower GDP growth should reduce real interest rates, while a lower savings rate should increase them.
- ❑ Since population aging can both slow GDP growth (through its impact on employment and productivity) *and* lower savings rates (as a larger share of the population enters the retirement years), the impact is uncertain. Aging could either pull interest rates down or push them up.
- ❑ To date, the growth effect has dominated, pulling interest rates down. In the future, however, the lifecycle effect may come to dominate, pushing interest rates back up again.

Inflation

- ❑ The traditional view: aging is deflationary. The old consume less than the young, depressing economic activity and prices.
- ❑ The new view: aging is inflationary. Consumer demand will outstrip productive capacity, driving prices up.

SOLOW-SWAN GROWTH MODEL

Formula for the Equilibrium Real Rate of Return
in a Growing Economy

$$r = \alpha * \underbrace{\frac{n+g+\delta}{s}}_{\text{Marginal Product of Capital Stock}} - (\text{Risk Premium})$$

r = Real Interest Rate

g = Productivity Growth Rate

n = Employment Growth Rate

s = Savings Rate

α = Capital Share of National Income

δ = Rate of Depreciation

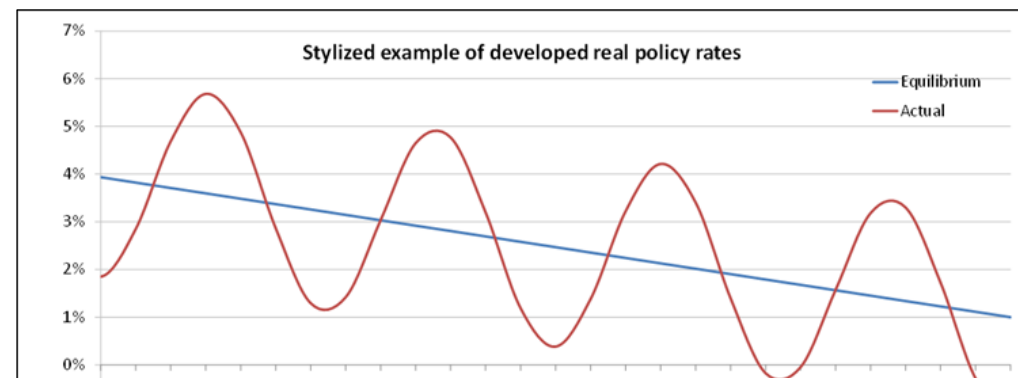
Investment Returns & Retirement Security

What Drives Investment Return?

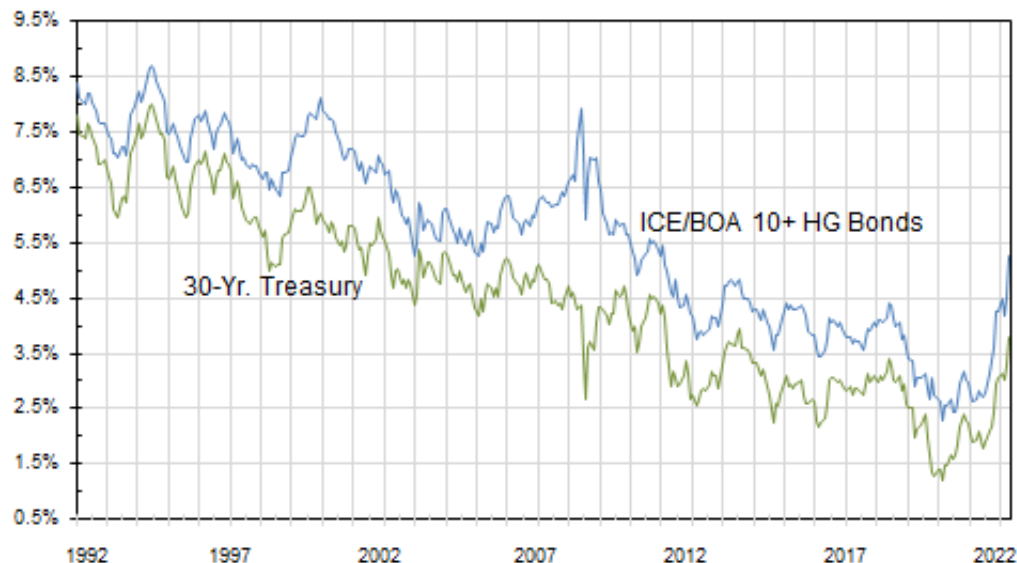
- Expectations for future profit growth
 - driven by economic growth
 - also by capital's share of GDP (competing with labor and government)
- Interest rates (that discount projected future profits/cash flows)
 - links to capital market dynamics, i.e., the supply of savings vs. demand for capital funds
 - inflation (realized and expected)
 - government monetary policy
- Investors confidence in projecting future growth and profits (sometimes labeled “sentiment”)

What Drives Interest Rates?

- Economic fundamentals – productivity growth and inflation
- Supply/demand for capital
 - level of savings and government monetary policy define supply
 - perceived risk/reward for various capital/investment alternatives determines demand
 - demographic trends influence the need for and incentives related to capital investments.
- Government fiscal and monetary policies
 - The goal of monetary policy is to set rates that facilitate economic growth and full employment while maintaining price stability. Interest rates are thus directed above and below the equilibrium level at different points in the business cycle.



Two Rationales for High Recent Stock Values

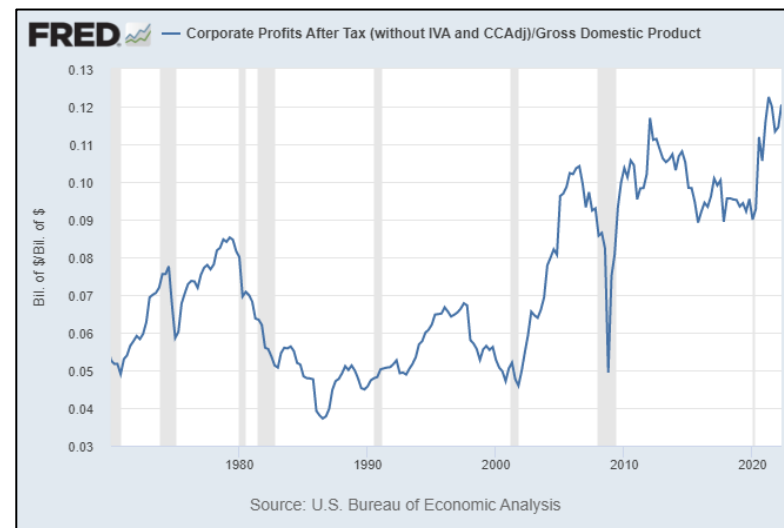


YE 2021 saw historic extremes for both interest rates (low) and corporate profits (high).

The capital market environment thus placed a high \$ value on a high projected stream of corporate profits....a favorable double whammy.

But these trends have played out – what will the new environment look like?

Declining Labor Costs = Increasing Profits



Impact of Aging Demographics on Investment Returns

Consensus → Low Returns

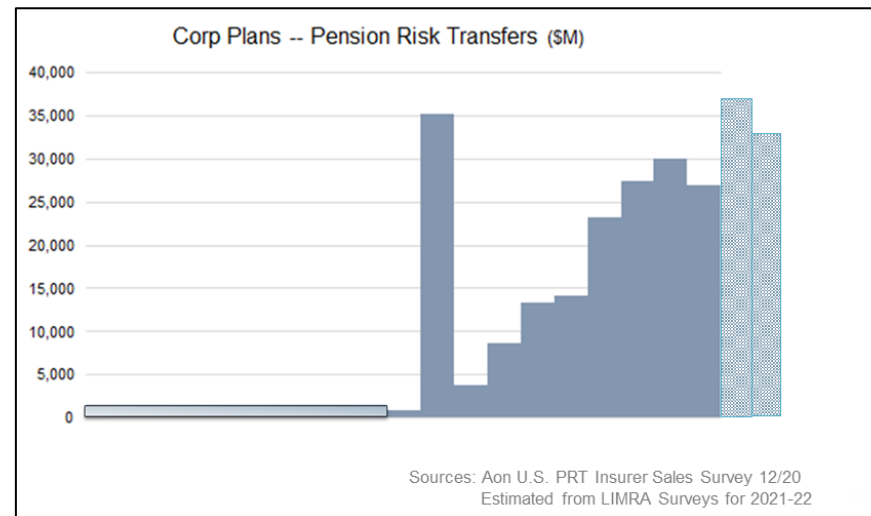
- Low GDP growth
- Scarce labor/increasing labor costs – hurts capital's share of GDP
- Increased tendency towards inflation – raises equilibrium interest rate
 - still, the impact on interest rates is a bit uncertain – since low growth and excess capital act to lower them
- Mixed impact on productivity-related investments – less capital broadening but incentives for automation
- Fewer workers in the high-savings phase – impairs capital growth
- Retirees ultimately start decumulating – could imply capital scarcity.

Bonds may get a temporary reprieve in return outlook due to older folks' proclivity for them.

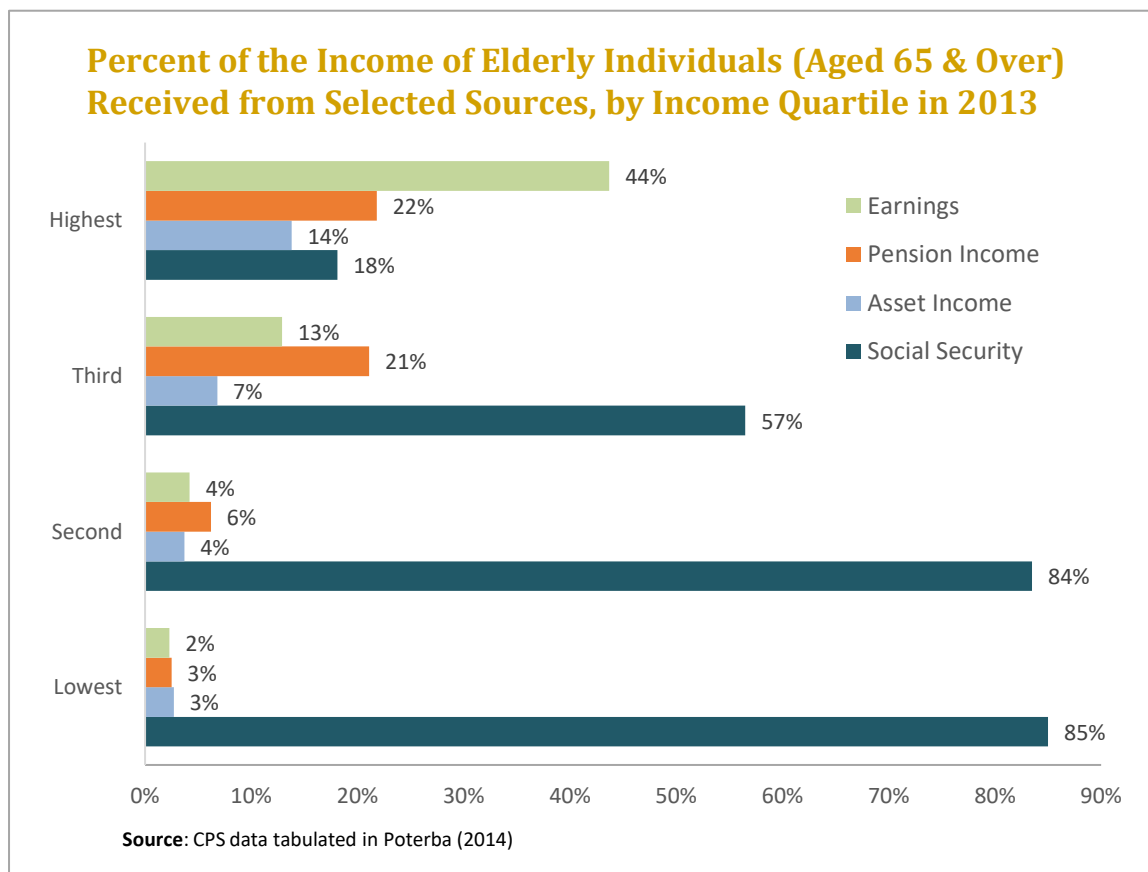
Impact on Pension Plans

Reduced return expectations flow through the system in many ways

- Pushing down public plan “discount rates” and thus adding pressure on their financing
 - creates an incentive for more aggressive asset allocations to enhance returns
(investments in hybrid-type alternatives went from 5% to 20% over twenty years)
- Lesser impact on corporate plans, since so many have moved to risk-controlling strategies
 - thus more responsive to interest rates than corporate profits/equity returns.



Impact on Individuals: Sources of Retirement Income



- Social Security is BY FAR the largest income source for retirees below the median income.
- Income from pension plans and other investments is important only for those at higher income levels.
- Income from earnings is also very important at higher income levels; labor participation rates among older population have been rising in recent decades.

What We Can Conclude about Individual Impacts

- Greatest impact on individuals who:
 - are more reliant on income from financial assets (high-income)
 - do not have significant housing assets
 - save too little or start saving late in their working years.
- Impact can be minimized via behavioral changes:
 - adjust lifetime savings
 - utilize housing equity to subsidize living expenses
 - delay retirement (increases level of Social Security benefits and reduces years drawing on assets)
 - work for added income in retirement.

The Bottom Line for Retirement Savings

- Return on invested funds will fall below historical expectations.
- This makes securing retirement income – no matter who is responsible – more expensive.
- Thus, those entities sponsoring retirement programs may continue to take actions to reduce their commitments – terminating/freezing/curtailing active membership.
- Affected individuals will need to adjust in a combination of ways:
 - saving more of their own funds
 - retiring later
 - reducing their standard-of-living in retirement.

The Impact on Social Security

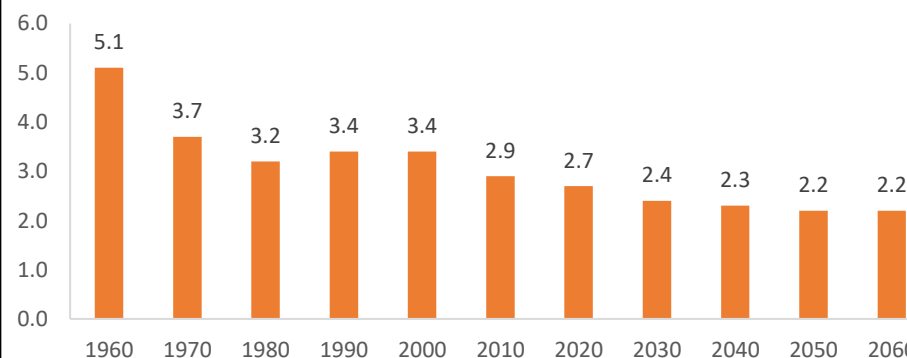
- ❑ Social Security has been running cash deficits since 2010, and the Trustees project that the combined OASDI trust funds will be exhausted in 2035, at which point benefits will have to be cut or taxes raised.
- ❑ Population aging both increases Social Security benefit costs and reduces Social Security revenues:
 - On the benefit side, the demographically driven decline in the ratio of taxpaying workers to retired beneficiaries is now rapidly pushing up the system's cost rate.
 - On the revenue side, slower employment growth is limiting growth in the payroll tax base. Lower productivity growth also feeds through to lower wage growth, further limiting growth in the payroll tax base.
 - Meanwhile, rising income inequality, which is due in part to slower wage growth, is pushing a larger share of workers' wages over the Social Security taxable maximum.
 - Lower investment returns have also undermined Social Security finances, though with the trust funds dwindling investment income will be less important in the future.

OASDI Income, Benefits, and Cash Balance, as a Share of Taxable Payroll, and Trust Fund Ratio, 1990-2075

	Income*	Benefits	Cash Balance	Ratio of Fund/Benefits
1990	12.7%	10.7%	+1.9%	0.8
2000	12.6%	10.4%	+2.2%	2.2
2010	12.5%	13.5%	-0.9%	3.6
2021	12.4%	13.9%	-1.5%	2.5
2030	13.2%	15.7%	-2.5%	0.9
2050	13.3%	17.0%	-3.6%	0
2075	13.4%	18.3%	-4.8%	0

Source: 2022 Trustees Report *Income excludes trust fund interest

Ratio of OASDI Covered Workers to Beneficiaries, 1960- 2060



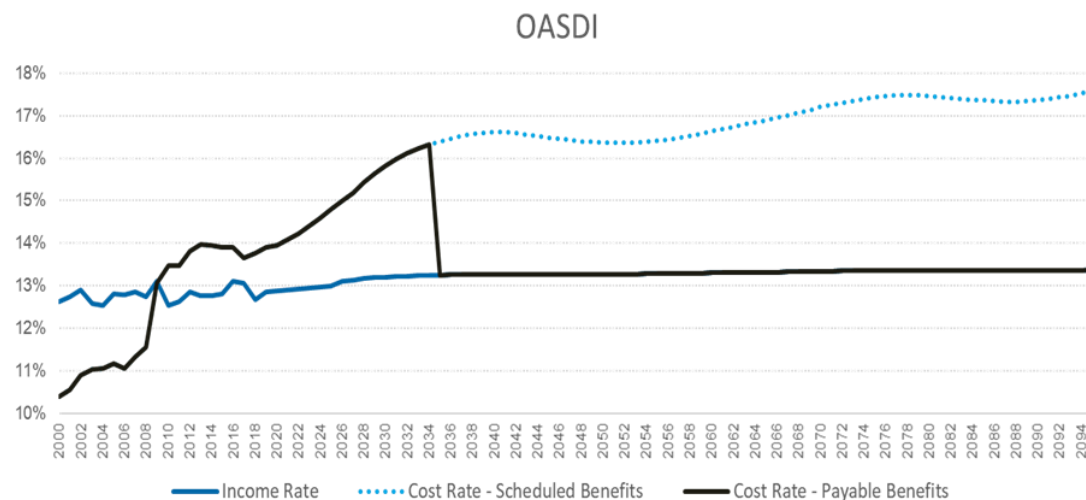
Source: 2022 Trustees Report

What About the Trust Fund?

The Social Security trust fund built up over the past 20 years during baby boomers' working careers.

1983 reform legislation incorporated forward thinking in that taxes were set higher than they needed to be to support a pay-as-you-go system of benefits. In this way, baby boomers partially funded their own retirements.

But – initially the trust was projected to last into the 2060s, after the last baby boomer recipient had presumably left the scene.

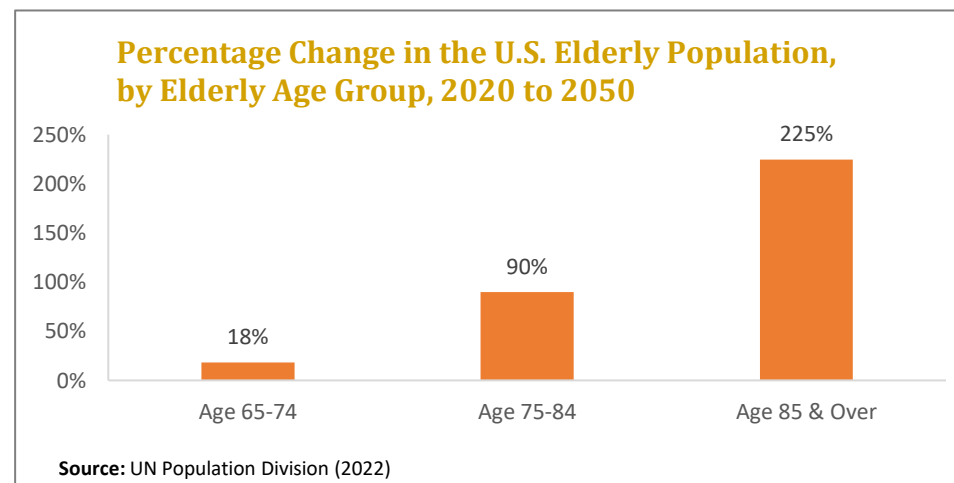
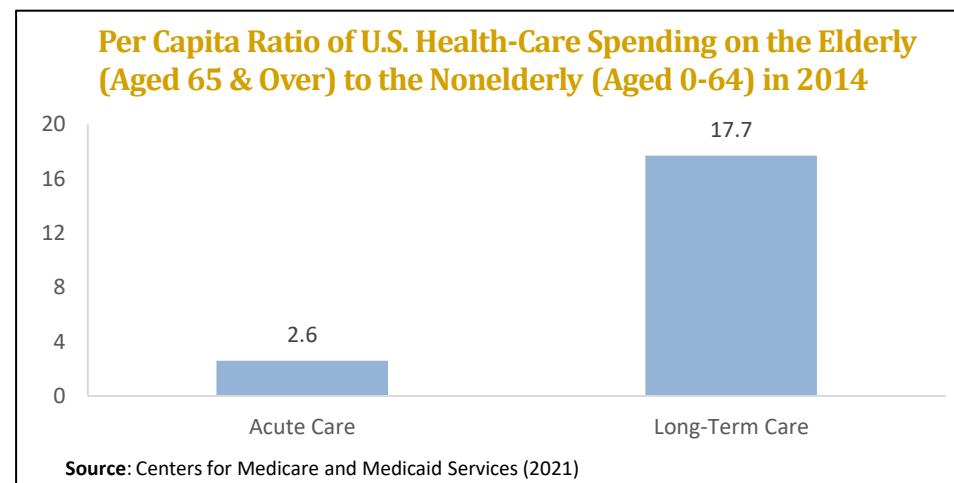


\$ billions	Trust Fund	Fund/Bens
1983	25	.14
1988	110	.4
1993	378	1.1
1998	762	1.7
2003	1,531	2.9
2008	2,419	3.6
2013	2,764	3.3
2018	2,894	2.9
2023	2,735	2.2

Social Security financial data relates to the entire OASDI program, and is sourced from the 2022 Trustees Report.

The Impact on Medicare and Medicaid

- ❑ Population aging is also a major driver of the growth in health-benefit costs, accounting for roughly one-third of the projected increase in federal spending on Medicare and Medicaid as a share of GDP between now and 2050.
- ❑ There are four age-related health-care multipliers:
 1. The elderly consume much more per capita in health-care services than the nonelderly.
 2. The elderly are the fastest growing segment of the population.
 3. The older the elderly are the more health care they consume.
 4. The oldest elderly age brackets are the fastest growing of all.
- ❑ The other two-thirds of the projected increase in spending is due to “excess cost growth” –that is, to the increase in the real cost of health-care services per age-adjusted beneficiary in excess of the increase in real per capita GDP. While some excess cost growth no doubt represents wasteful spending, much represents technology-driven improvements in the quality of care.



Potential Countervailing Developments

Demographic Developments

❑ *Higher Immigration*

Net Immigration has fallen since the Great Recession. Although higher immigration cannot reverse the aging of the population, it can help ensure that America still has a growing workforce.

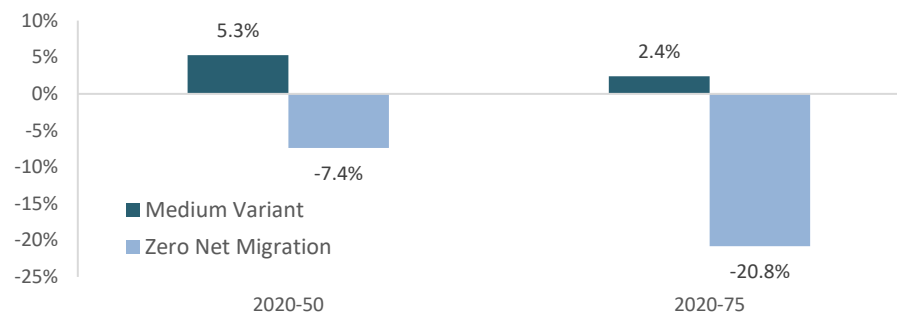
Some developed countries, notably Australia and Canada, have made immigration a lynchpin of their strategy to address the aging challenge. So could the United States.

❑ *Higher Birthrates*

U.S. birthrates have also fallen since the Great Recession. Although higher birthrates cannot increase economic growth or reduce dependency burdens in the near term, they could be an important part of a long-term response to the aging challenge.

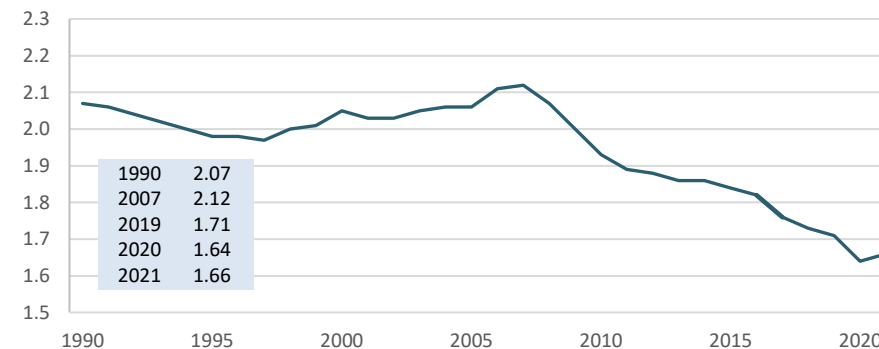
The persistent gap between ideal and expected fertility on the one hand and realized fertility on the other suggests that new policy initiatives which help workers, and especially women, balance jobs and family could be part of the solution.

Percentage Change in the U.S. Working-Age Population, by Period and Scenario, 2020-2075



Source: UN Population Division (2022)

U.S. Total Fertility Rate, 1990-2021



Source: NCHS (various years)

Economic Developments

❑ *Longer Work Lives*

Elderly labor-force participation has increased significantly over the past two decades and become a critical driver of economic growth. If the trend toward longer work lives continues, it could help to offset the economic drag of slower growth in the traditional working-age population.

❑ *Capital Deepening Investment*

While *capital broadening* investment will decline as America ages, labor scarcity creates incentives to increase *capital deepening* investment (technology/innovation/ automation). This could help boost productivity.

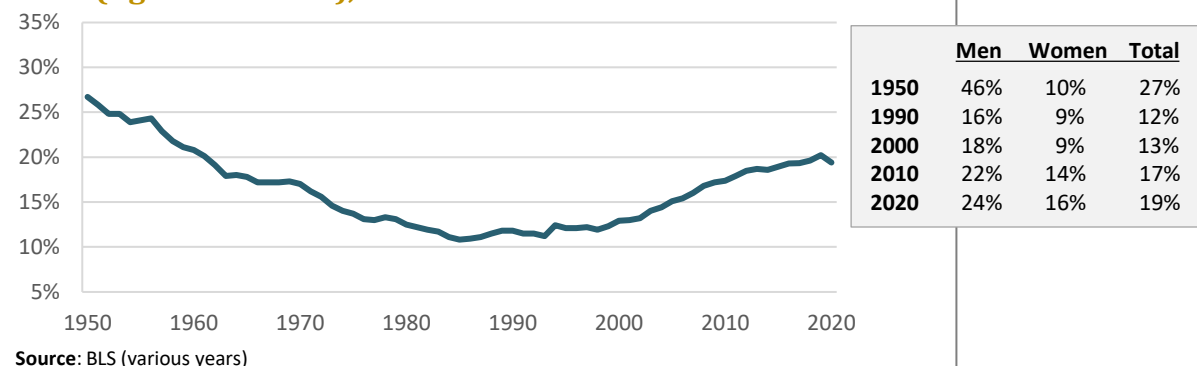
❑ *Entitlement Reform*

Policy reforms that reduce the deadweight tax and/or debt burden of rising old-age benefit costs could improve economic growth.

❑ *Global Capital Flows*

Open global capital markets can mitigate the costs of population aging by matching savings with investment opportunities. If capital becomes scarce in an aging developed world, capital inflows from a younger and higher-saving emerging world could help prop up living standards.

**Labor-Force Participation Rate of the U.S. Elderly
(Aged 65 & Over), 1950-2020**



**Contribution of the Elderly and Nonelderly to Labor-
Force Growth, by Decade, 1970-2020**

