The Macro Challenges of Population Aging

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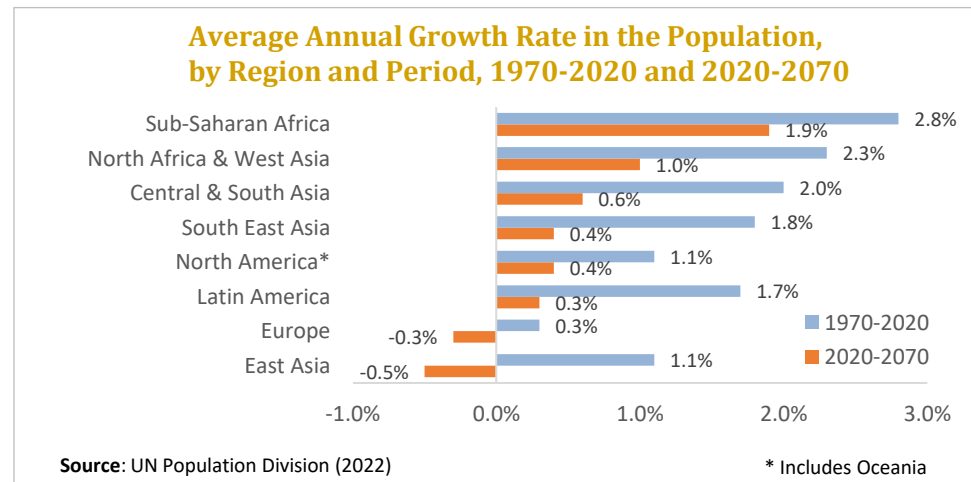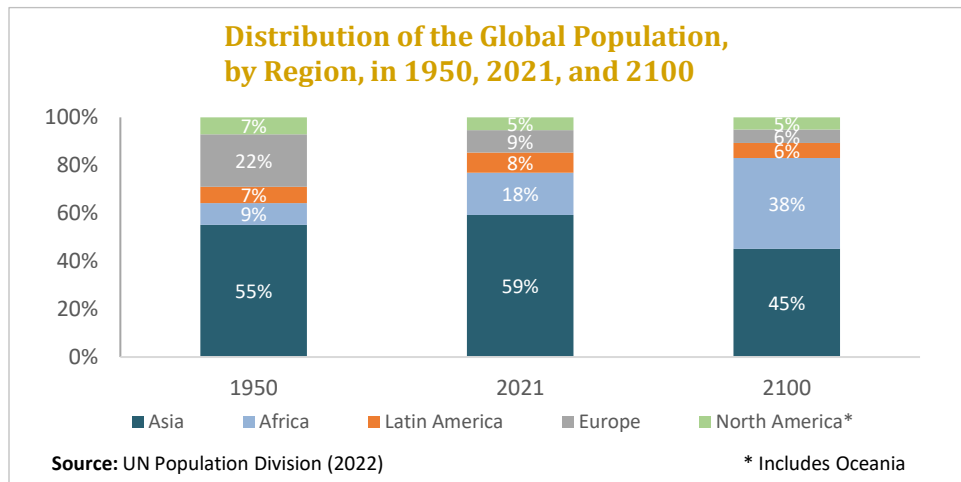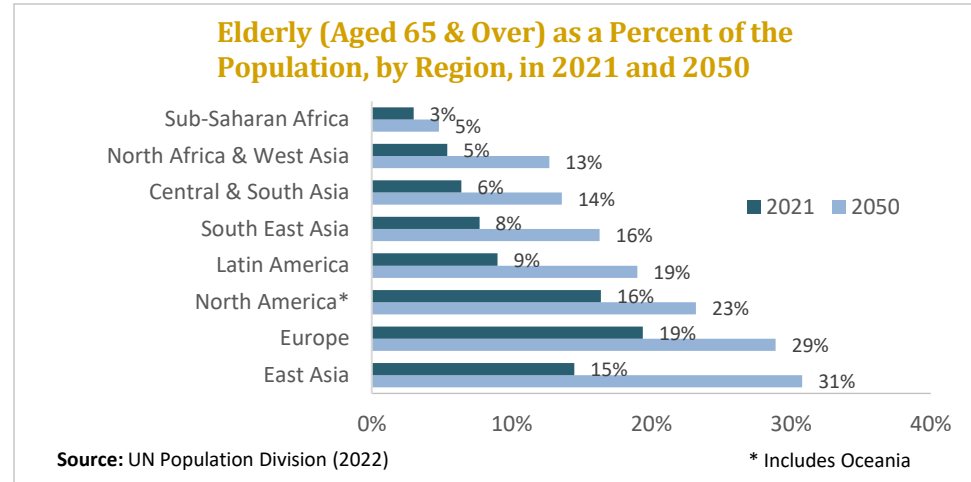
GFIA Aging Working Group

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The Demographic Transition

- The population will age dramatically in most regions of the world, especially Europe and East Asia.

- The population will grow much more slowly or contract in most regions of the world, the major exceptions being Sub-Saharan Africa and the Greater Middle East.

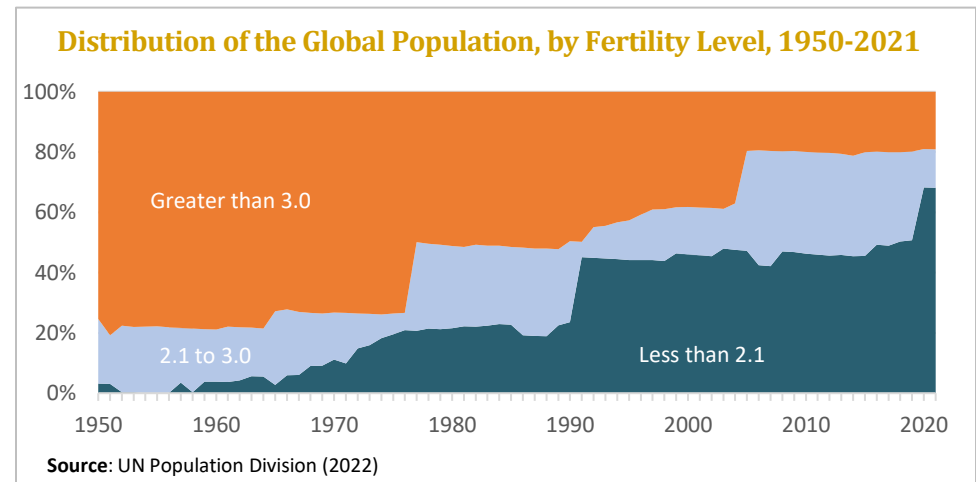- There will be a stunning shift in the distribution of the world's population by country and region.

Elderly (Aged 65 & Over) as a Percent of the Population, by Region, in 2021 and 2050

Region	2021	2050
Sub-Saharan Africa	3%	5%
North Africa & West Asia	5%	13%
Central & South Asia	6%	14%
South East Asia	8%	16%
Latin America	9%	19%
North America*	16%	23%
Europe	19%	29%
East Asia	15%	31%

Source: UN Population Division (2022)   * Includes Oceania

Distribution of the Global Population, by Region, in 1950, 2021, and 2100

	1950	2021	2100
North America*	7%	5%	2%
Europe	22%	9%	6%
Latin America	7%	8%	6%
Africa	9%	18%	38%
Asia	55%	59%	45%

Legend: Asia, Africa, Latin America, Europe, North America*

Source: UN Population Division (2022)   * Includes Oceania

Average Annual Growth Rate in the Population, by Region and Period, 1970-2020 and 2020-2070

Region	1970-2020	2020-2070
Sub-Saharan Africa	2.8%	1.9%
North Africa & West Asia	2.3%	1.0%
Central & South Asia	2.0%	0.6%
South East Asia	1.8%	0.4%
North America*	1.1%	0.4%
Latin America	1.7%	0.3%
Europe	0.3%	-0.3%
East Asia	1.1%	-0.5%

Source: UN Population Division (2022)   * Includes Oceania

- ❑ There are two forces behind the demographic transition that gives rise to population aging and population decline.

- ❑ The first force is rising life expectancy. People are living longer, and this increases the relative number of old in the population.

- ❑ The second force is falling fertility. People are having fewer babies, and this decreases the relative number of young in the population.

- ❑ While both forces are important, it is falling fertility that is the dominant driver of global population change.

	Life Expectancy at Birth				Total Fertility Rate			
	1950	1975	2000	2021	1950	1975	2000	2021
Europe	63	71	74	77	2.7	2.1	1.4	1.5
North America*	68	72	77	78	3.0	1.9	2.0	1.7
East Asia	43	63	73	79	5.5	3.3	1.6	1.2
South East Asia	42	55	68	70	5.8	5.0	2.6	2.1
Central & South Asia	41	52	63	68	5.9	5.5	3.5	2.3
North Africa & West Asia	42	56	69	72	6.6	6.0	3.4	2.8
Latin America	49	61	71	72	5.8	4.7	2.6	1.9
Sub-Saharan Africa	38	46	51	60	6.5	6.8	5.7	4.6

Source: UN Population Division (2022)   *Includes Oceania

Distribution of the Global Population, by Fertility Level, 1950-2021

Greater than 3.0

2.1 to 3.0

Less than 2.1

Source: UN Population Division (2022)

The Stages of the Demographic Transition

❑ **Stage 1:** Declining mortality rates lead to rising youth dependency burdens and rapid population growth. Demographic trends tend to lean against economic growth and social and political stability.

❑ **Stage 2:** Fertility rates fall with a lag. Declining dependency burdens and rising median ages open up a window of opportunity for rapid economic and social development known as the "demographic dividend."

❑ **Stage 3:** The growth in the number of elderly overtakes the decline in the number of children. Dependency burdens rise again and populations stagnate or contract. Demographic trends once more tend to lean against economic growth and may increase geopolitical risks.

	Median Age					
	1950	**1975**	**2000**	**2021**	**2030**	**2050**
Europe	28	31	37	42	44	47
North America*	29	27	34	37	39	43
East Asia	22	20	30	39	43	51
South East Asia	19	18	23	30	32	37
Central & South Asia	20	18	21	27	29	36
North Africa & West Asia	19	17	20	26	27	32
Latin America	18	18	23	30	34	40
Sub-Saharan Africa	18	16	16	18	19	23

Source: UN Population Division (2022)   * Includes Oceania

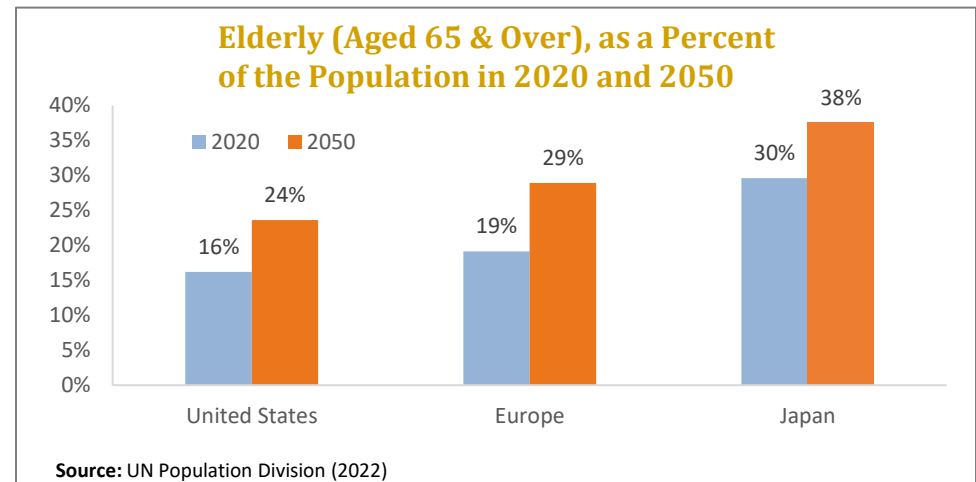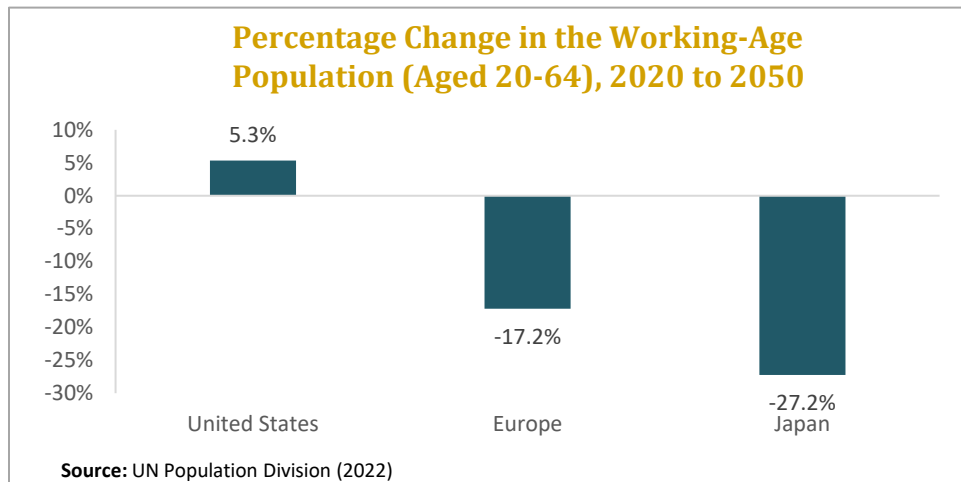|	Total Dependency Ratio**					
	1950	**1975**	**2000**	**2021**	**2030**	**2050**
Europe	75	77	65	68	75	90
North America*	74	84	69	71	75	80
East Asia	100	110	66	59	62	85
South East Asia	114	130	88	68	68	72
Central & South Asia	108	124	104	76	69	68
North Africa & West Asia	116	136	106	81	77	76
Latin America	120	127	92	69	66	72
Sub-Saharan Africa	124	137	141	126	115	90

Source: UN Population Division (2022)   *Includes Oceania
**Children (aged 0-19) plus elderly (aged 65 & over) per 100 working-age adults (aged 20-64).

The Developed World Outlook

- ❑ **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, narrowing America's demographic advantage.**
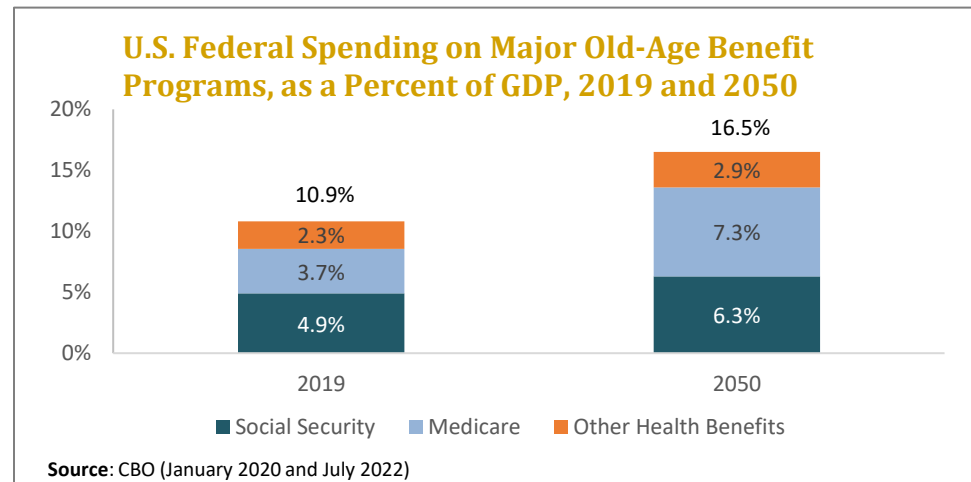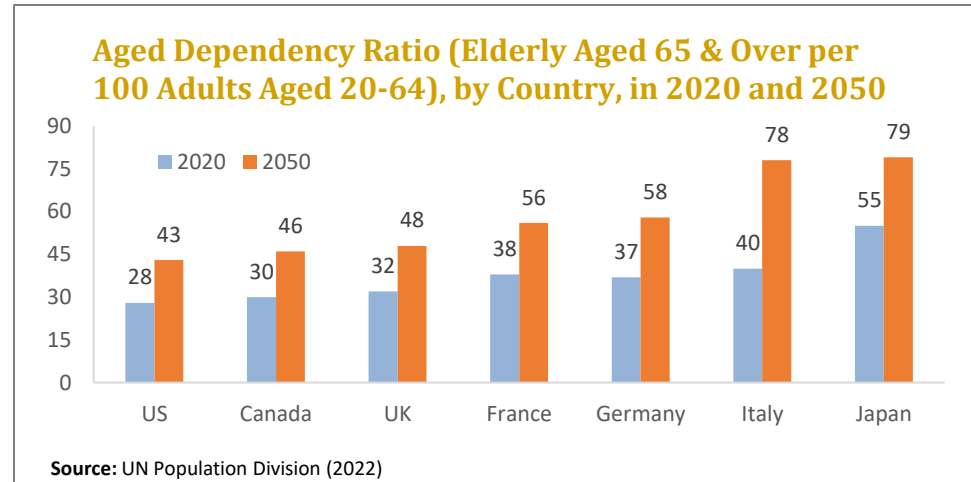
	Life Expectancy at Birth				Total Fertility Rate			
	1960	1980	2000	2021	1960	1980	2000	2021
Canada	71	75	79	83	3.9	1.7	1.5	1.5
France	70	74	79	82	2.7	2.0	1.9	1.8
Germany	69	73	78	81	2.4	1.5	1.4	1.5
Italy	69	74	80	83	2.4	1.6	1.3	1.3
Japan	68	76	81	85	2.0	1.7	1.4	1.3
UK	71	74	78	81	2.7	1.9	1.6	1.6
US*	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

Percentage Change in the Working-Age Population (Aged 20-64), 2020 to 2050

United States: 5.3%
Europe: -17.2%
Japan: -27.2%

Source: UN Population Division (2022)

Elderly (Aged 65 & Over), as a Percent of the Population in 2020 and 2050

2020 | 2050

United States: 16% | 24%
Europe: 19% | 29%
Japan: 30% | 38%

Source: UN Population Division (2022)

☐ 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 retirement and health benefit programs.

☐ 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 developed countries have socialized the cost of being old to a much greater extent than the cost of being young.
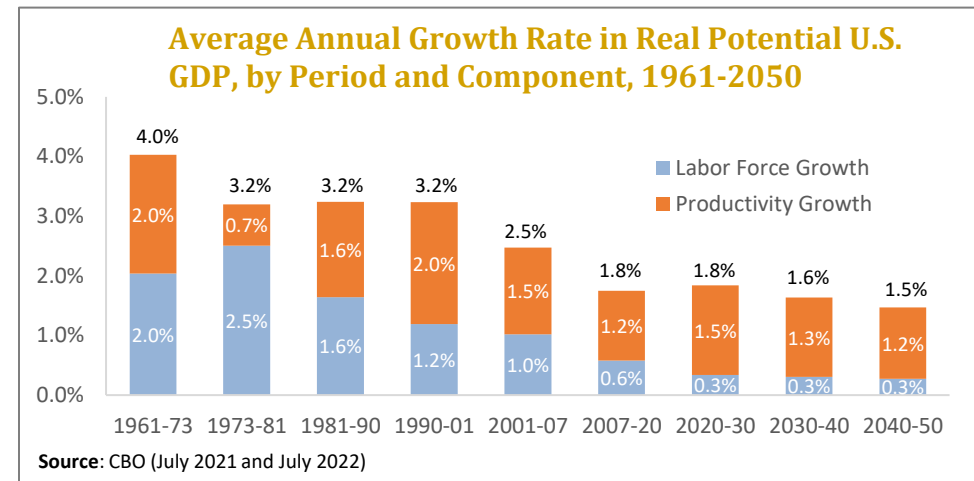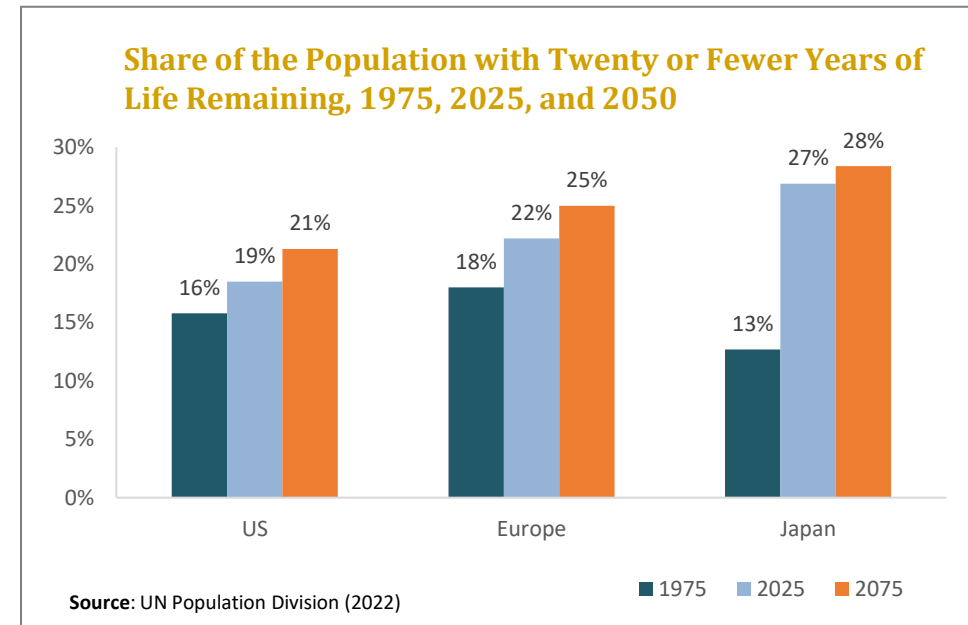
Aged Dependency Ratio (Elderly Aged 65 & Over per 100 Adults Aged 20-64), by Country, in 2020 and 2050

Legend: ■ 2020 ■ 2050

Country	2020	2050
US	28	43
Canada	30	46
UK	32	48
France	38	56
Germany	37	58
Italy	40	78
Japan	55	79

Source: UN Population Division (2022)

U.S. Federal Spending on Major Old-Age Benefit Programs, as a Percent of GDP, 2019 and 2050

	2019	2050
Other Health Benefits	2.3%	2.9%
Medicare	3.7%	7.3%
Social Security	4.9%	6.3%
Total	10.9%	16.5%

Legend: ■ Social Security ■ Medicare ■ Other Health Benefits

Source: CBO (January 2020 and July 2022)

- ❏ **Over time, lower fertility translates into slower growth in the working-age population, which in turn translates into slower growth in employment and GDP.**

- ❏ **Productivity growth may also decline in aging societies, further dragging down economic growth:**

  - ➤ **More slowly growing workforces mean less investment demand and a slower turnover in the capital stock.**

  - ➤ **Rising fiscal deficits may crowd public investment out of government budgets and private investment out of capital markets.**

  - ➤ **Aging workforces may be less flexible, less mobile, and less entrepreneurial.**

  - ➤ **Economies will be increasingly dominated by service industries resistant to productivity improvements.**

- ❏ **Real GDP growth in the United States could fall to less than 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-2040s						
	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 Real Potential U.S. GDP, by Period and Component, 1961-2050

Source: CBO (July 2021 and July 2022)

❑ There may also be psychological dynamics to population aging that further undermine economic growth.

❑ With the size of domestic markets growing more slowly, 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 psychology could be mirrored by a broader shift 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.

Share of the Population with Twenty or Fewer Years of Life Remaining, 1975, 2025, and 2050

Source: UN Population Division (2022)

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 more of the population enters the retirement years), the impact is uncertain. Aging could either pull interest rates down or push them up.**

❑ **Over the past few decades, the growth effect has dominated, pulling interest rates down. In the future, the lifecycle effect may dominate, pushing them up.**

Inflation

❑ **The traditional view: Aging is deflationary. The old consume less than working-age adults, 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

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

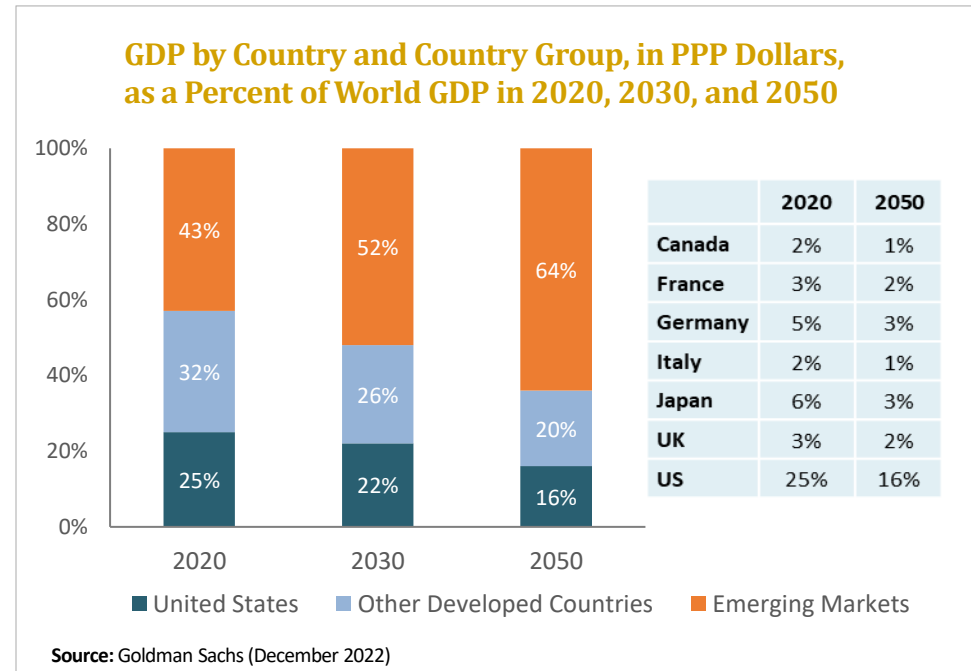r = Real Interest Rate n = Employment Growth Rate
g = Productivity Growth Rate s = Savings Rate

α = Capital Share of National Income
δ = Rate of Depreciation

❑ Experts disagree about the economic benefits of absolute demographic size. One school of thought stresses that large and growing populations can benefit from increasing returns to scale (mainly involving large public undertakings), while another stresses that size also involves decreasing returns to scale (mainly involving natural resources and the environment).

❑ When it coms to geopolitics, however, virtually no one disputes that demographic size and economic size together are potent twin engines of national power.

❑ Over the next few decades, the developed world will be shrinking steadily in demographic and economic size relative to a faster-growing emerging world.

❑ While history has many examples of demographically small powers that exercised outsized geopolitical sway, it has few if any examples of demographically and economically stagnant or contracting powers that were at the same time geopolitically rising powers.

GDP by Country and Country Group, in PPP Dollars, as a Percent of World GDP in 2020, 2030, and 2050

	2020	2050
Canada	2%	1%
France	3%	2%
Germany	5%	3%
Italy	2%	1%
Japan	6%	3%
UK	3%	2%
US	25%	16%

Chart (stacked bar, % of World GDP):

	2020	2030	2050
Emerging Markets	43%	52%	64%
Other Developed Countries	32%	26%	20%
United States	25%	22%	16%

■ United States   ■ Other Developed Countries   ■ Emerging Markets
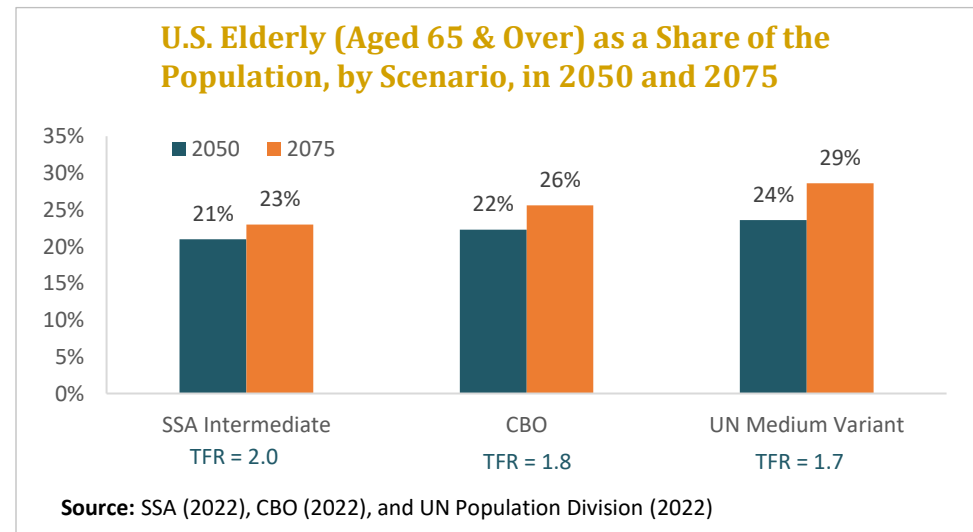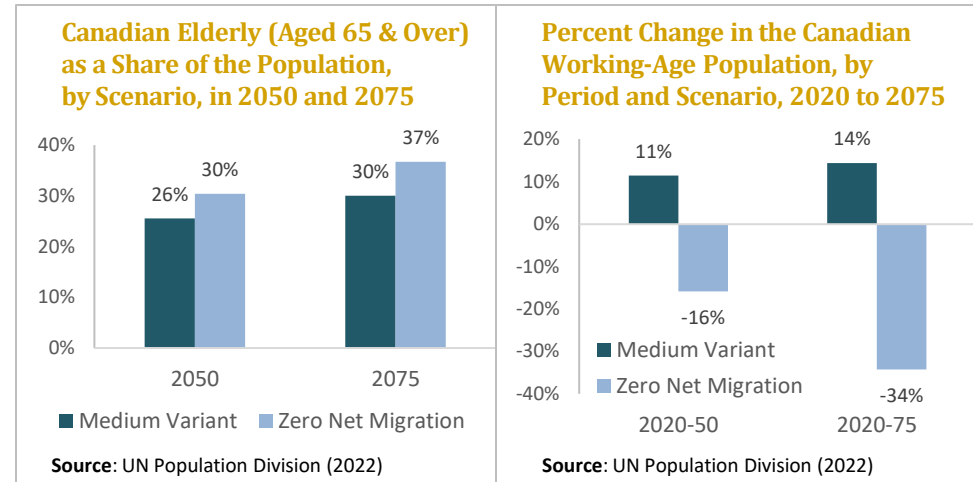
Source: Goldman Sachs (December 2022)

Strategic Responses

❑ *Increase Immigration*

Although higher immigration cannot reverse the aging of the population, it can help to ensure that aging developed countries have a growing workforce and a growing economy. Some countries, notably Australia and Canada, have made immigration the lynchpin of their strategy to address the aging challenge.

❑ *Facilitate Higher Birthrates*

Policies that make it easier for workers, and especially women, to balance job and family responsibilities could help to increase birthrates. 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.

Canadian Elderly (Aged 65 & Over) as a Share of the Population, by Scenario, in 2050 and 2075

- Medium Variant
- Zero Net Migration

2050: 26%, 30%
2075: 30%, 37%

Source: UN Population Division (2022)

Percent Change in the Canadian Working-Age Population, by Period and Scenario, 2020 to 2075

- Medium Variant
- Zero Net Migration

2020-50: 11%, -16%
2020-75: 14%, -34%

Source: UN Population Division (2022)

U.S. Elderly (Aged 65 & Over) as a Share of the Population, by Scenario, in 2050 and 2075

- 2050
- 2075

SSA Intermediate (TFR = 2.0): 21%, 23%
CBO (TFR = 1.8): 22%, 26%
UN Medium Variant (TFR = 1.7): 24%, 29%

Source: SSA (2022), CBO (2022), and UN Population Division (2022)

Economic Responses
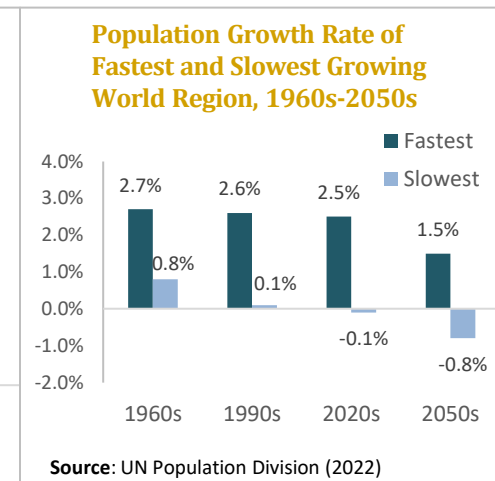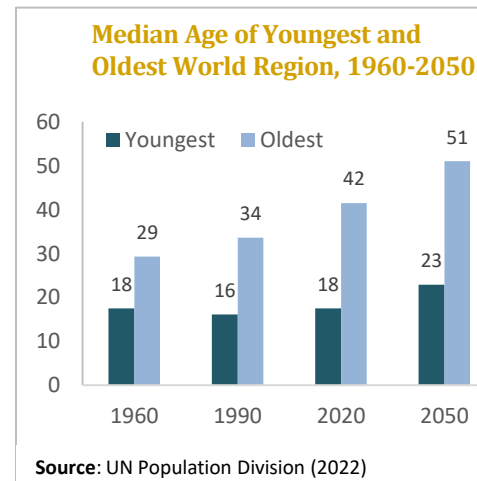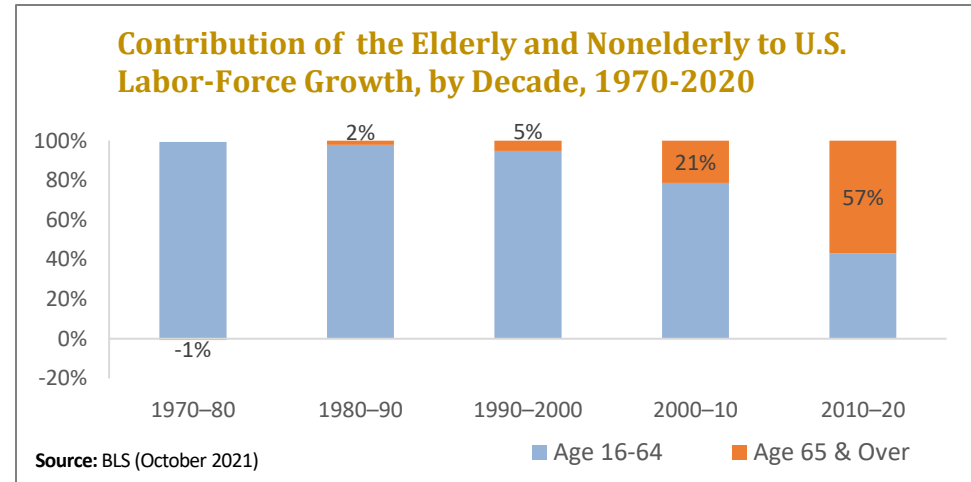
❑ *Extend Work Lives*

The elderly are not only the most underutilized human resource in today's developed countries, but are also the fastest growing segment of their populations. Longer work lives would be good for the economy, good for government budgets, and, according to most gerontologists, good for the elderly themselves.

❑ *Reform Old-Age Benefit Programs*

Policy reforms that reduce the deadweight tax and/or debt burden of rising old-age benefit spending could increase economic and living standard growth.

❑ *Promote Globalization*

Open global capital markets can match savers with investment opportunities, while open global labor markets can match workers with job opportunities. If today's developed countries turn inward, it will be much more difficult for them to meet the aging challenge.

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

Decade	1970–80	1980–90	1990–2000	2000–10	2010–20
Age 65 & Over	-1%	2%	5%	21%	57%

Source: BLS (October 2021)

■ Age 16-64   ■ Age 65 & Over

Median Age of Youngest and Oldest World Region, 1960-2050

	1960	1990	2020	2050
Youngest	18	16	18	23
Oldest	29	34	42	51

Source: UN Population Division (2022)

Population Growth Rate of Fastest and Slowest Growing World Region, 1960s-2050s

	1960s	1990s	2020s	2050s
Fastest	2.7%	2.6%	2.5%	1.5%
Slowest	0.8%	0.1%	-0.1%	-0.8%

Source: UN Population Division (2022)

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