Appendix A: CBO's Projections of Demographic and Economic Trends

The Congressional Budget Office develops its assessment of the long-term outlook for the federal budget on the basis of its projections of demographic and economic factors over the next three decades. The projections presented in this report are consistent with the baseline budget projections and the economic forecast for the 2021–2031 period that CBO published in February 2021.[1] Those projections incorporate the assumption that current laws governing federal taxes and spending generally remain unchanged and that no significant additional emergency funding or aid is provided. (The agency's annual projections of demographic and economic factors are included in this report's supplemental data; they are available online at www.cbo.gov/publication/56977.)

Demographic Factors

Changes in the size and composition of the U.S. population influence the growth of the economy and affect federal tax revenues and spending. Rates of fertility, net immigration, and mortality determine how the population evolves, and the relative contribution each factor makes to population growth changes over time.

Population

In CBO's projections, changes in fertility, net immigration, and mortality rates over the next 30 years mean that the population increases from 335 million people at the beginning of 2021 to 375 million in 2051.[2] Although the population increases, the rate of increase slows over the next three decades, from an average rate of 0.4 percent per year in the first decade to an average rate of 0.3 percent per year in the third decade (see Table A-1). The population is also projected to become older, on average, from 2021 to 2051. The share of the population age 65 or older grows in CBO's projections, whereas the share that is of working age (ages 20 to 64) shrinks. By 2051, CBO expects the population will be 1.1 percent smaller (equaling 4 million fewer people) than the agency projected last year.

Fertility

CBO projects that the total fertility rate—representing the average number of children that a woman would have in her lifetime—will remain at its most recent historical value of 1.71 children per woman in 2020 and decline to 1.61 children per woman in 2021 in response to the economic effects of the 2020–2021 coronavirus pandemic. CBO expects the fertility rate to gradually rise to 1.85 children per woman by 2029 and remain at that value thereafter. That rate is lower than the agency projected last year. As a result, CBO projects fewer births over the entire projection period and a smaller working-age population in the last decade.

Projections of Fertility. CBO projects fertility on the basis of the agency's assessment of historical fertility trends, the effects of the pandemic, and other factors. The fertility rate did not rebound after the 2007–2009 recession (the Great Recession) as it did in previous economic cycles. The rate was 2.02 children per woman, on average, in the 20 years before that recession, peaking at 2.12 in 2007. After 2007, the rate generally fell, equaling 1.71 births per woman in 2019 (the most recent year for which data are available). The decline was largely attributable to lower fertility rates among women age 24 or younger.[3]

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1. See Congressional Budget Office, *The Budget and Economic Outlook: 2021 to 2031* (February 2021), www.cbo.gov/publication/56970, and *An Overview of the Economic Outlook: 2021 to 2031* (February 2021), www.cbo.gov/publication/56965.

2. CBO's projection of the Social Security area population in the year 2020 is roughly consistent with the 2020 Demographic Analysis estimate produced by the Census Bureau. The Social Security area population includes residents of the 50 states and the District of Columbia; civilian residents of Puerto Rico, Guam, American Samoa, and the Northern Mariana Islands; federal civilian employees and military personnel abroad and their dependents; crew members of merchant vessels; and all other U.S. citizens abroad.

3. See Brady E. Hamilton and others, "Births: Provisional Data for 2019," *Vital Statistics Rapid Release*, no. 8 (National Center for Health Statistics, May 2020), www.cdc.gov/nchs/data/vsrr/vsrr-8-508.pdf (372 KB).

Table A-1.

Average Annual Values for Demographic Variables That Underlie CBO's Extended Baseline Projections

	1991–2020	2021–2031	2032–2041	2042–2051	2021–2051
Social Security Area Population (Millions of people)[a]					
Age 19 or younger	82.5	81.8	82.8	86.4	83.6
Ages 20 to 64	178.1	195.7	199.6	203.6	199.5
Age 65 or older	39.8	64.3	76.3	80.9	73.5
Total	**300.5**	**341.8**	**358.8**	**370.9**	**356.7**
Growth of the Social Security Area Population (Percent)[a]					
Age 19 or younger	0.4	-0.2	0.4	0.2	0.1
Ages 20 to 64	0.8	0.1	0.2	0.2	0.2
Age 65 or older	1.9	2.4	0.8	0.5	1.3
Overall	**0.8**	**0.4**	**0.4**	**0.3**	**0.4**
Contribution to Population Growth (Percentage points)[b]					
Births	1.4	1.1	1.2	1.1	1.1
Deaths	-0.9	-1.0	-1.1	-1.1	-1.0
Net immigration	0.4	0.3	0.3	0.3	0.3
Contribution to Population Growth (Percent)					
Births and deaths	54.3	41.5	25.8	-10.6	24.1
Net immigration	45.7	58.4	74.1	110.5	75.8
Civilian Noninstitutionalized Population[c]					
Size (Millions of people)	226.3	271.0	285.7	295.1	283.5
Growth (Percent)	1.0	0.6	0.3	0.3	0.3
Memorandum:					
Fertility Rate (Children per woman)	1.95	1.76	1.85	1.85	1.82
Life Expectancy at Birth, End of Period (Years)[d]	76.6	79.9	81.1	82.2	82.2
Life Expectancy at Age 65, End of Period (Years)[d]	18.2	20.2	20.9	21.6	21.6
Dependency Ratio[e]	0.7	0.7	0.8	0.8	0.8
Immigration Rate (Per 1,000 people in the U.S. population)	3.8	2.6	3.0	2.9	2.8

Data sources: Congressional Budget Office; Social Security Administration. See www.cbo.gov/publication/56977#data.

The extended baseline projections, which generally reflect current law, follow CBO's 10-year baseline budget projections and then extend most of the concepts underlying those projections for the rest of the long-term projection period.

a. The Social Security area population includes residents of the 50 states and the District of Columbia; civilian residents of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Northern Mariana Islands; federal civilian employees and military personnel abroad and their dependents; crew members of merchant vessels; and all other U.S. citizens abroad.

b. Values represent the percentage-point contribution of each factor to the average annual growth rate of the population. The sum of the contributions of the three factors equals the overall growth of the Social Security area population.

c. The civilian noninstitutionalized population includes individuals age 16 or older who are not inmates of institutions or on active duty in the armed forces.

d. Life expectancy here refers to period life expectancy, which is the amount of time that a person in a given year would expect to survive beyond his or her current age on the basis of that year's mortality rates for various ages.

e. The dependency ratio is the ratio of the non-working-age population (people age 19 or younger and people age 65 or older) to the working-age population (people ages 20 to 64).

CBO expects the fertility rate to fall to 1.61 births per woman in 2021 and then rise to 1.85 births per woman in 2029, remaining at that value thereafter. That rate is below the replacement rate—the fertility rate required for a generation to exactly replace itself in the absence of immigration—of 2.1 births per woman.

Changes in Projections of Fertility Since Last Year.
CBO anticipates the total fertility rate to be lower, on average, after 2028 than the agency's projection last year of 1.90 births per woman. As a result, CBO now expects 130,000 fewer births a year, on average, over the first decade of the projection period than it did last year. The lower number of births has two effects on demographic trends later in the projection period. First, it lowers the number of working-age people by 300,000, on average, in the last decade of the period. Second, it reduces the number of births even more over the latter part of the period because there will be fewer adults of child-bearing age. In the last two decades of the projection period, CBO expects there to be 160,000 fewer births annually, on average, than it projected last year.

Immigration

Under current law, CBO projects that annual net immigration to the United States (a measure that accounts for all people who either enter or leave the United States in any year) will rise from 0.9 million people, on average, in the first decade of the projection period to 1.1 million people, on average, in the third decade of the period. CBO's projection of net immigration is roughly unchanged since last year.

Projections of Immigration. CBO projects net immigration in three categories: lawful permanent residents (LPRs), legal temporary residents (LTRs), and foreign-born people without legal status. Over the first two decades of the projection period, CBO estimates net flows for each category on the basis of the agency's economic projections and its assessment of recent trends. In the last decade of the period, CBO projects, net immigration for most categories will grow each year at a rate equal to overall population growth in the previous year (0.3 percent per year, on average).

Total net immigration flows averaged 1.5 million people per year between 2000 and 2006 before falling considerably in 2007 and 2008 as the Great Recession began. Those flows did not return to their previous levels in subsequent years. From 2009 to 2019, the total net flow of immigration averaged one million people per year.

CBO estimates that immigration fell in 2020 because of travel restrictions and reduced visa-processing capabilities, both of which are related to the pandemic. Immigration is projected to increase as the pandemic's effects subside and economic conditions improve. The annual net flow of LPRs is projected to increase from an average of 800,000 people per year in the first decade of the projection period to 850,000 per year in the second decade. The annual net flow of LTRs is projected to average 60,000 people per year in the first decade of that period and 80,000 people per year in the second decade. The net flow of foreign-born people without legal status is projected to be 40,000 people per year, on average, in the first decade of the projection period, rising to 140,000 people per year, on average, in the second decade of the period.

Changes in Projections of Immigration Since Last Year. CBO's projections of net immigration are roughly unchanged from its projections in 2020. The agency projects an average net immigration rate of 2.8 immigrants per 1,000 people between 2021 and 2051, identical to the 30-year average in last year's report.

Although the average net immigration rate is essentially unchanged, total net immigration flows in the second and third decades of the projection period are slightly higher than the agency reported last year. That increase stems from slightly higher projected net flows of foreign-born people without legal status, the result of technical changes to CBO's analytic methods. On average, there are 10,000 more immigrants per year in that category than the agency projected over the second and third decades of the projection period last year.

Mortality

CBO anticipates that mortality rates, which represent the annual number of deaths per 1,000 people, will decline over the next 30 years. As a result, life expectancy at birth is projected to increase from its average of 79.1 years from 2021 to 2031 to an average of 81.7 years from 2042 to 2051. Similarly, life expectancy at age 65 is projected to rise from an average of 19.8 years in the first decade of the projection period to an average of 21.3 years in the third decade. In response to the pandemic, CBO now projects more deaths in the near term than it did last year. Over the long term, projected life expectancy at birth and at age 65 are essentially unchanged from last year's projections.

Projections of Mortality. CBO projects mortality rates on the basis of its assessment of historical trends in mortality and the effects of the pandemic. The mortality rate has generally declined in the United States since the early 20th century, but the rate of that decline has slowed over time and even reversed in recent years. For the most part, mortality rates have decreased more quickly for younger people than for older people. However, mortality rates have risen in recent years, particularly among people ages 15 to 44.

The result of those recent higher mortality rates was that life expectancy at birth declined between 2015 and 2017, the first decreases in that metric since 1993. The decreases were primarily driven by increases in mortality from Alzheimer's disease, suicide, and drug overdoses (particularly opioids).[4]

Through 2022, CBO projects mortality rates by first forecasting that they decrease at roughly the same average rate as they did between 2008 and 2017. The agency then adjusts that initial forecast to account for the additional deaths associated with the pandemic. Additional deaths include fatalities from the coronavirus as well as increased fatalities attributable to heart disease, diabetes, pneumonia, and other respiratory illnesses. Deaths from causes other than the pandemic may result from individuals' delaying or not seeking treatment during the pandemic, or they may be directly attributable to the coronavirus but misclassified because of other underlying conditions. (That increased number of additional deaths may be partially offset by a decrease in the number of accidental deaths.) For the remainder of the projection period, the agency expects a return to longer-term trends in mortality improvement, projecting that mortality rates for each age group will generally decline at the average pace experienced between 1950 and 2017.

After projecting average mortality rates for men and women, CBO incorporates differences in those rates for people age 30 or older on the basis of their marital status, education, disability-insurance status, and lifetime household earnings (for people younger than 30, the mortality projections account for age and sex only). CBO projects lower mortality rates and longer life expectancy for people who are married, have more education,

do not receive benefits through the Social Security Disability Insurance program, or are high earners.[5]

Changes in Projections of Mortality Since Last Year. CBO currently projects 180,000 (or 0.5 percent) more deaths in the first decade of the projection period than the agency projected last year. That difference stems from increases in the agency's projections of fatalities in 2021 and 2022 as a result of the pandemic.

Over the long term, the agency's estimates of life expectancy at birth and at age 65 are essentially unchanged from last year's projections. CBO projects life expectancy at birth to be 82.2 years in 2051, whereas the agency last year projected it to be 82.0 years in 2050. Life expectancy at age 65 is projected to be 21.6 years in 2051, the same as last year's estimate for 2050.

Contributions of Demographic Factors to Population Growth
The combination of the three demographic factors described above—fertility, immigration, and mortality—determines CBO's projections of total population growth. Over the course of the next decade, immigration accounts for about 60 percent of the overall increase in the size of the population, and the net contributions of fertility and mortality account for the other 40 percent. With fertility rates expected to remain below the replacement rate, immigration will become an increasingly important part of overall population growth in the United States. In CBO's projections, deaths exceed births by 2044, indicating that without immigration, the population would decline. Thereafter, population growth is driven entirely by immigration (see Figure A-1).

Economic Factors
The federal government's revenues, spending, and debt depend on economic factors such as the growth of gross domestic product (GDP); the size and composition of the labor force; the number of hours worked; the distribution of earnings among workers; the accumulation of capital;

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4. For an account of the way factors affecting mortality and mortality improvement rates have changed over time, see National Center for Health Statistics, *Health, United States, 2018* (NCHS, 2019), www.cdc.gov/nchs/data/hus/hus18.pdf (1.6 MB).

5. For more information about mortality differences among groups with different earnings, see Tiffany Bosley, Michael Morris, and Karen Glenn, *Mortality by Career-Average Earnings Level,* Actuarial Study 124 (Social Security Administration, April 2018), https://go.usa.gov/xGcme (PDF, 301KB); Congressional Budget Office, *Growing Disparities in Life Expectancy* (April 2008), www.cbo.gov/publication/41681; and Julian P. Cristia, *The Empirical Relationship Between Lifetime Earnings and Mortality,* Working Paper 2007–11 (Congressional Budget Office, August 2007), www.cbo.gov/publication/19096.

Figure A-1.

Demographic Factors That Contribute to Population Growth

Percent
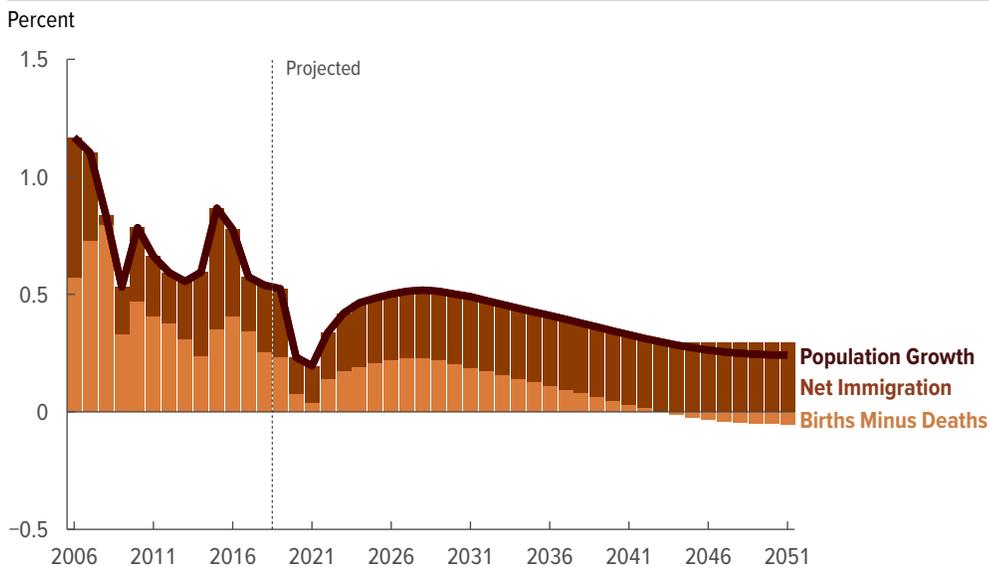
As fertility rates remain below the replacement rate—the rate required for a generation to exactly replace itself—immigration plays an increasingly important role in population growth. In CBO's projections, deaths exceed births by 2044, indicating that without immigration, the population would decline. Thereafter, population growth is driven entirely by immigration.

Data sources: Congressional Budget Office; Social Security Administration. See www.cbo.gov/publication/56977#data.

Net immigration is the difference between the number of people who enter the United States and the number who leave.

and productivity, inflation, and interest rates. CBO's projections of those factors reflect the agency's assessment of various economic and demographic developments, as well as the effects of policy on economic activity.

Gross Domestic Product

CBO expects real (inflation-adjusted) GDP to grow 1.8 percent per year, on average, over the 2021–2051 period (see Table A-2). That is 0.5 percentage points less than the average growth of 2.3 percent for the past three decades. CBO expects growth in real GDP per person to average 1.4 percent over the next three decades, 0.1 percentage point higher than the average growth of 1.3 percent throughout the past three decades. In the agency's current projections, both real GDP and real GDP per person grow slightly more quickly over the 2020–2050 period than the agency projected last year.

Projections of GDP. In CBO's projections, the average annual growth of real GDP slows from 2.2 percent in the first decade of the projection period to slightly less than 1.6 percent in the second decade and just over 1.5 percent in the third decade. In part, the deceleration in growth from the first decade to the second results from the economy's relatively rapid near-term growth in the wake of the 2020 recession caused by the pandemic.

However, that deceleration also reflects a gradual slowing of growth that results mainly from a slower rate of capital accumulation.

CBO's long-term projections of GDP reflect the agency's projections of potential real GDP, a measure of the maximum sustainable level of output. The growth of potential GDP is determined by the growth of the potential labor force (the labor force adjusted for fluctuations in the business cycle) and of potential labor force productivity (potential output per member of the potential labor force). Growth in potential labor force productivity, in turn, is built from projections of trends in several different sectors of the economy. Among those trends are potential hours per worker; the accumulation of capital, such as structures and equipment, intellectual property products, and residential housing; and, in the nonfarm business sector, the growth of potential total factor productivity (TFP), which is the potential output per unit of combined labor and capital.

Typically, the growth rate of actual output in CBO's forecasts converges with the growth rate of potential output in the second half of the first decade of the projection period, and the level of actual output stays about 0.5 percent below the level of potential output thereafter.

Table A-2.

Average Annual Values for Economic Variables That Underlie CBO's Extended Baseline Projections

Percent

	1991–2020	2021–2031	2032–2041	2042–2051	2021–2051
Growth of GDP					
Real GDP	2.3	2.2	1.6	1.5	1.8
Real potential GDP[a]	2.4	1.8	1.6	1.5	1.6
Potential labor force	0.9	0.3	0.3	0.3	0.3
Potential labor force productivity	1.5	1.4	1.3	1.2	1.3
Nominal GDP (Fiscal year)	4.3	4.2	3.6	3.5	3.8
Real GDP per person	1.3	1.7	1.1	1.2	1.4
Growth of the Labor Force	0.8	0.5	0.3	0.3	0.4
Labor Force Participation Rate	65.2	61.6	60.3	60.1	60.7
Unemployment					
Unemployment rate	5.9	4.4	4.4	4.2	4.3
Natural rate of unemployment[b]	5.0	4.4	4.1	4.0	4.2
Growth of Average Hours Worked	*	*	*	*	*
Growth of Total Hours Worked	0.6	0.9	0.3	0.3	0.5
Earnings as a Share of Compensation	81	81	80	79	80
Growth of Real Earnings per Worker	1.3	0.8	0.9	0.8	0.8
Share of Earnings Below the Taxable Maximum	84	83	82	81	82
Growth of Productivity					
Total factor productivity in the nonfarm business sector	1.2	1.1	1.1	1.1	1.1
Real GDP per hour worked	1.6	1.3	1.3	1.2	1.3
Inflation					
Growth of the CPI-U	2.3	2.3	2.2	2.2	2.3
Growth of the GDP price index	1.9	2.1	2.0	2.0	2.0
Interest Rates					
Real rates					
On 10-year Treasury notes and the OASDI trust funds	2.0	*	1.6	2.3	1.3
Nominal rates					
On 10-year Treasury notes and the OASDI trust funds	4.3	2.4	3.8	4.6	3.5
On all federal debt held by the public[c]	4.6	1.5	3.2	4.1	2.9

Data source: Congressional Budget Office. See www.cbo.gov/publication/56977#data.

The extended baseline projections, which generally reflect current law, follow CBO's 10-year baseline budget projections and then extend most of the concepts underlying those projections for the rest of the long-term projection period.

Real values are nominal values that have been adjusted to remove the effects of changes in prices.

CPI-U = consumer price index for all urban consumers; GDP = gross domestic product; OASDI = Old-Age, Survivors, and Disability Insurance; * = between -0.05 percent and 0.05 percent.

a. Potential GDP is CBO's estimate of the maximum sustainable output of the economy. Growth in real potential GDP is the sum of growth in the potential labor force and growth in potential labor force productivity. The potential labor force is the labor force (that is, the number of people in the civilian noninstitutionalized population who are age 16 or older and who are either working or actively seeking work), adjusted to remove the effects of fluctuations in the business cycle. Potential labor force productivity is the ratio of real potential GDP to the potential labor force.

b. The natural rate of unemployment is the rate that results from all sources except fluctuations in aggregate demand, including normal turnover of jobs and mismatches between the skills of available workers and the skills necessary to fill vacant positions.

c. The interest rate on all federal debt held by the public equals net interest payments in the current fiscal year divided by debt held by the public at the end of the previous fiscal year.

That persistent gap between actual output and potential output reflects the agency's assessment that actual output falls short of potential output to a greater extent and for longer periods during and after economic downturns than actual output exceeds potential output during economic booms.[6]

CBO's current projection deviates from that typical pattern because real GDP dropped significantly below real potential GDP in 2020 and also because the agency expects monetary policy to allow real GDP to rise above potential for a number of years during the projected expansion. In the current forecast, real GDP recovers to its prerecession peak in mid-2021, continues to expand, and surpasses its potential in early 2025. Real GDP remains above potential GDP for several years, but as monetary policy gradually tightens, the growth rate of real GDP gradually slows. Real GDP falls below potential GDP in 2029 and gradually returns to its long-term relationship with potential output in the mid-2030s.

Real GDP per person is expected to increase at an average annual rate of 1.4 percent over the 2021–2051 period, compared with 1.3 percent for the past 30 years. However, the past 30 years include the 2020 recession. Compared instead with the average growth rate for the 1989–2019 period (1.5 percent), projected growth is slower over the next 30 years.

Changes in Projections of GDP Since Last Year. CBO's current projections of real GDP are higher than last year's throughout the 30-year projection period, primarily because the economic effects of the pandemic proved to be less negative than expected: The downturn in early 2020 was not as pronounced as the agency estimated last year, and the recovery in the second half of the year was much stronger. As a consequence, the level of real GDP is projected to be 1.0 percent higher in 2031, even though real GDP growth over the next decade is now projected to be more than 0.1 percentage point slower than it was

last year. In the second and third decades of the projection period, real GDP is expected to grow slightly more slowly than projected last year, largely because the agency slightly raised its projections of the unemployment rate. By 2050, the level of real GDP is only about 0.6 percentage points greater than expected last year.

Labor Force Participation and Labor Force Growth
The size of the labor force depends on the rates at which people in different demographic groups participate in the labor market. Since the mid-2000s, the overall rate of labor force participation in the United States has declined substantially, driven predominantly by the aging of the population.[7] CBO expects that decline to continue over the first half of the 30-year projection period before leveling off in the second half of the period. As a result, the labor force is expected to grow even more slowly than the number of people age 16 or older, at an average rate of 0.4 percent per year from 2021 to 2051.

CBO's current projections of labor force participation are higher than last year's throughout the 30-year period, reflecting the stronger-than-expected economic and labor market recovery from the 2020 recession in the near term and the agency's reassessment of the effects of demographic shifts in the long term. As a result, CBO currently projects the labor force to be larger throughout the projection period than the agency anticipated last year, even though it expects the population to be smaller, on average.

Projections of Labor Force Participation. In CBO's projections, the rate of labor force participation rebounds from 61.5 percent in late 2020 to 62.1 percent in 2022 as a substantial fraction of the population acquires immunity from the coronavirus and rejoins the labor force and as the economy recovers from the 2020 recession. After 2022, as downward pressure from the aging population offsets upward momentum from the economic recovery, the labor force participation rate is projected to decline gradually, to 60.8 percent in 2031 and 60.2 percent in 2041. As demographic shifts slow over time, the participation rate is expected to gradually stabilize, hovering around 60.1 percent in the third decade of the projection period.

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6. A recent study explains the existence of a persistent output gap by examining asymmetric fluctuations in the natural rate of unemployment (that is, the rate that results from all sources except fluctuations in aggregate demand). See Stéphane Dupraz, Emi Nakamura, and Jón Steinsson, *A Plucking Model of Business Cycles,* Working Paper 748 (Banque De France, January 2020), https://tinyurl.com/1njkmzkf. The agency assessed the persistent output gap in an earlier report. See Congressional Budget Office, *Why CBO Projects That Actual Output Will Be Below Potential Output on Average* (February 2015), www.cbo.gov/publication/49890.

7. The labor force participation rate is the share of the civilian noninstitutionalized population age 16 or older that is working or actively seeking work.

The aging of the population accounts for all of the decline in the overall labor force participation rate in the coming decades, in CBO's projections. People age 65 or older tend to participate in the labor force at lower rates than younger people. In 2019, for example, the average participation rate was 82.5 percent among the civilian noninstitutionalized population ages 25 to 54 and 20.2 percent among those age 65 or older. As the baby-boom generation started to turn age 65 in the early 2010s, the share of people age 65 or older in the civilian noninstitutionalized population increased rapidly, from 16.3 percent in 2010 to 20.4 percent in 2019. CBO anticipates that the percentage of people age 65 or older will continue to rise to 27.0 percent by 2041 before becoming more stable in the third decade of the projection period. Were it not for the aging of the population, the overall rate of labor force participation over the coming decades would be substantially higher than currently projected, in CBO's assessment.

In addition to the aging of the population, CBO expects several other demographic trends, economic trends, and current fiscal policies to also influence the labor force participation rate in the coming decades. In particular, two long-term trends are expected to increase participation in the labor force:

- The population is becoming more educated, and people with more education tend to participate in the labor force at higher rates than do people with less education.

- Increasing longevity is expected to lead people to continue working to increasingly older ages.

CBO expects those two trends to be mostly offset by two other trends that will put downward pressure on the participation rate:

- Members of each generation that follows the baby boomers (particularly men) tend to participate in the labor force at lower rates than its predecessors did at the same ages. (One notable exception in later generations is that the share of women age 34 or younger who work is higher than it was for baby-boomer women at the same ages. However, as those later generations of women have aged, their participation rates have also fallen below those of their predecessors.)

- The marriage rate is projected to continue to fall, and unmarried men tend to participate in the labor force at lower rates than married men.

In addition to the effects of those demographic trends, budgetary effects and incentives under current tax law, combined with economic trends, also affect the labor force. For example, rising federal deficits are projected to slow growth in the stock of private capital and to limit the growth of wages, thereby reducing the supply of labor. In addition, as people's income rises faster than inflation, more of their income is pushed into higher tax brackets through a process known as real bracket creep, raising their effective tax rates. Higher tax rates and real bracket creep are projected to decrease participation in the labor force because individuals would earn less return on their labor.

Changes in Projections of Labor Force Participation Since Last Year. CBO's current projections of labor force participation are higher than last year's throughout the 30-year projection period. The agency raised its projection of the labor force participation rate in the near term, primarily because incoming data on employment and unemployment since CBO completed its previous projections indicated that the labor market recovery has been much stronger than CBO previously projected, which supports higher labor force participation in the coming years. CBO also raised its projections of the labor force participation rate over the medium term and long term after reassessing the historical trends in participation among various demographic groups.

Projections of the Labor Force. Largely owing to the pandemic and associated recession, the number of people in the labor force shrank by 3.9 million (or 2.4 percent) by the end of 2020 from its pre-pandemic level; growth is projected to pick up in 2021 as the economy continues to recover. However, the long-term decline in labor force participation means that less of the population's growth translates into labor force growth. For the 2021–2051 period, the number of people age 16 or older is expected to grow by 0.5 percent per year, on average, and the labor force is projected to grow at an average rate of 0.3 percent per year after 2021. That represents a significant slowdown from earlier periods: For example, the average annual growth rate in the labor force was 1.2 percent during the 1990–2006 period and 0.6 percent during the 2010–2019 period.

Changes in Projections of the Labor Force Since Last Year. CBO's current projection of the size of the labor force in the second half of 2021 is 0.8 percent larger than its previous projection, reflecting a stronger recovery from the pandemic and recession. After 2021, labor force growth is projected to be slightly weaker, on average, than CBO anticipated last year, as the negative effect of slower population growth more than offsets the positive effect of a higher labor force participation rate. As a result of the stronger recovery in the near term and the slower growth in later years, by 2050, the size of the labor force is 0.2 percent larger in the current projections than it was in last year's estimates.

Other Labor Market Outcomes
In addition to the rate of labor force participation and the size and growth of the labor force, CBO's long-term labor market outlook includes projections over the next 30 years of the unemployment rate, the average and total number of hours that people work, and various measures of workers' earnings. The agency regularly updates those projections to incorporate revisions in historical data, reassessments of economic and demographic trends, and changes to the agency's analytic methods.

Unemployment. The unemployment rate is projected to decline gradually in the coming years as a result of continued economic growth and legislation the Congress passed in 2020. In CBO's projections, the overall unemployment rate falls from 6.7 percent at the end of 2020 to 5.3 percent by late 2021. It is projected to fall below its natural rate by 2024 and reach 3.9 percent by 2026. However, the unemployment rates for younger workers, workers without a bachelor's degree, and Black or Hispanic workers are expected to improve more slowly than the overall unemployment rate.

After the first decade or so, the unemployment rate is expected to remain roughly one-quarter of one percentage point above its natural rate, a difference that is consistent with both the average historical relationship between the two measures and the projected gap of one-half of one percent between actual and potential GDP.[8]

CBO projects the natural rate of unemployment to decline gradually over the next three decades, from

4.5 percent in 2021 to 4.3 percent in 2031 and to 3.9 percent in 2051. That slow decline reflects the continuing shift in the composition of the workforce toward older workers, who tend to have lower rates of unemployment (when they participate in the labor force), and away from less-educated workers, who tend to have higher ones. As the natural rate of unemployment declines, the actual unemployment rate is also projected to decline. By 2051, the actual rate is projected to reach 4.2 percent.

Average Hours Worked. Workers tend to work a different number of hours depending on their industry: For example, workers in manufacturing put in more than 40 hours per week, on average, whereas those in service industries work about 32 hours per week. As the share of workers employed in manufacturing has decreased and the share employed in service industries has increased over the past several decades, the average number of hours worked per week has declined for the economy as a whole. During the past decade, the shares of workers in the manufacturing and service industries have been largely stable. In CBO's assessment, future changes in the employment shares of different industries are unlikely to have substantial effects on the economywide number of average hours worked.

Incentives under current tax law are projected to influence the average number of hours worked. Higher tax rates on individual income would take effect when, under current law, certain provisions of the 2017 tax act expire at the end of 2025. In CBO's projections, those higher rates slightly reduce the average number of hours worked beginning in 2026. In addition, CBO projects effective tax rates on individual income to rise because of real bracket creep. Given economic trends and current laws, CBO expects the average number of hours worked to decline slightly over the next 30 years. By 2051, CBO expects the average worker to work about 0.6 percent fewer hours per week than he or she does today.

Total Hours Worked. Based on projections of the growth of the labor force, average hours worked, and unemployment, CBO estimates that total hours worked will increase at an average annual rate of 0.5 percent between 2021 and 2051. That is less than the average annual increase of 0.6 percent in total hours worked over the past three decades. The deceleration in the growth of total hours is mainly because the population is expected

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8. The natural rate of unemployment is the rate that results from all sources except fluctuations in aggregate demand, including normal turnover of jobs and mismatches between the skills of available workers and the skills necessary to fill vacant positions.

to grow more slowly in the future than it has over the past 30 years.

In CBO's projections, the average growth in total hours worked is 0.9 percent in the first decade, 0.3 percent in the second decade, and 0.3 percent in the third decade. The unusually large growth in hours worked over the first decade of the projection period reflects the economic recovery from the 2020 recession.

Earnings as a Share of Compensation. Workers' total compensation consists of taxable earnings and nontaxable benefits such as employers' contributions to health insurance and pensions. Over the years, the share of total compensation paid in the form of wages and salaries has declined—from 91 percent in 1960 to 82 percent in 2020—mainly because the cost of health insurance has risen more quickly than total compensation.[9] Because CBO expects that the cost of health insurance will continue to rise, the portion of compensation that workers receive as earnings is projected to decline, on average, to 80 percent of total compensation over the 2021–2051 period, reaching 79 percent in 2051.

Growth of Real Earnings per Worker. Projections of prices, the amount of nonwage compensation (such as employment-based health insurance), the average number of hours worked, and labor productivity imply that real earnings per worker will grow by an average of 0.8 percent annually over the 2021–2051 period. That rate is less than the 1.3 percent average annual growth of real earnings per worker over the past 30 years.

Distribution of Earnings. In CBO's projections, earnings grow faster for higher earners than for lower earners. As a result, the share of earnings accruing to workers in the top 10 percent of the earnings distribution increases at an average rate of 0.2 percent per year. That rate of growth is less than it was between 1978 and 2019, when the share of earnings accruing to workers in the top 10 percent of the earnings distribution increased by 0.6 percent per year.

The distribution of earnings affects revenues from income taxes and payroll taxes, among other things. Income taxes are affected by the earnings distribution because of the progressive rate structure of the individual income tax; people with lower income pay a smaller share of their earnings in taxes than people with higher income.

Social Security payroll taxes are also affected by the earnings distribution. Those taxes are levied only on earnings up to a certain annual amount ($142,800 in 2021). Because earnings have grown more for higher earners than for others, the portion of covered earnings on which Social Security payroll taxes are paid has fallen from 90 percent in 1983 to 82 percent in 2018.[10] The portion of earnings subject to Social Security taxes is projected to rise to 83 percent, on average, between 2021 and 2031, fall to an average of 82 percent in the second decade of the projection period, and remain at an average of 82 percent in the third decade, equaling 81 percent in 2051. That decline in the share of covered earnings below the taxable maximum reduces the projected balance of the Social Security trust funds.

Changes in Projections of Other Labor Market Outcomes Since Last Year. Several projections of labor market outcomes differ from last year's projections. CBO's current projection of the unemployment rate is substantially lower than it was last year for the first decade of the projection period, but slightly higher for the second and third decades. Two factors account for the majority of the near-term revision: First, incoming data on employment and unemployment after CBO completed its projections last year indicate a much stronger labor market recovery than the agency anticipated, driven primarily by more-rapid rehiring of workers who were temporarily laid off. Second, projected economic activity, as reflected in GDP and other economic indicators, is stronger throughout the coming decade in CBO's current projections, in part because of various laws enacted in 2020.[11] The unemployment rate is projected to be higher in the second and third decades than CBO projected last year, largely because the agency increased its estimate of the natural rate of unemployment.

CBO's current projections of real earnings per worker grow more slowly than they did last year, mainly because its projections for the labor market have changed. Last

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9. For more details, see Congressional Budget Office, *How CBO Projects Income* (July 2013), www.cbo.gov/publication/44433.

10. Covered earnings are those received by workers in jobs subject to Social Security payroll taxes. Most workers pay payroll taxes on their earnings, although a small number—mostly in state and local government jobs or in the clergy—are exempt. Earnings above the taxable maximum are also exempt from payroll taxation, and no additional benefits accrue to those excess earnings.

11. See Congressional Budget Office, *The Effects of Pandemic-Related Legislation on Output* (September 2020), www.cbo.gov/publication/56537. Also see divisions M, N, and EE of the Consolidated Appropriations Act, 2021.

year, the agency expected the labor market recovery to be weaker than it was in 2020 and stronger through the 2021–2030 period than it projects this year. As a result, although CBO's current projections of real earnings per worker grow more slowly over the first decade, they are roughly the same in 2030 as it estimated last year. CBO's current projection grows at roughly the same rate as last year's projection over the second and third decades of the projection period.

In CBO's current projections, earnings as a share of compensation are higher than the agency previously estimated for the first decade of the projection period and modestly lower thereafter. The projection is higher in the first decade because the increase in taxable earnings relative to last year's projection is larger than the increase in nontaxable benefits over the first decade. During the second and third decades, slightly slower growth in earnings accompanied by slightly faster growth in nontaxable benefits causes earnings as a share of compensation to fall below the agency's projections last year. The faster growth in nontaxable benefits occurs because CBO expects the cost of health insurance to grow slightly faster than the agency projected last year in the second and third decades. As a result, earnings as a share of compensation are slightly lower in the third decade of the period than the agency published last year.

CBO's projections of the earnings distribution also differ from last year's projections. The top 10 percent of earners in 2050 are projected to make 45 percent of all earnings, slightly less than the projection from last year. Those projections changed because CBO improved its method for calculating the distribution of earnings, leading to a smaller share of earnings accruing to high-wage earners over the long run. (That revision is also the reason that CBO increased its projections of the share of covered earnings on which Social Security payroll taxes are paid.)

Capital Accumulation and Productivity

In addition to the rate of labor force participation, labor force growth, and other labor market outcomes, two other factors directly affect CBO's projections of output. One is the accumulation of capital—residential housing, other structures, equipment, land, and intellectual property such as computer software. That accumulated stock of capital contributes a stream of services to production. The second factor is TFP growth. In CBO's projections, most TFP growth occurs in the nonfarm business sector, which accounts for about three-quarters of economic activity.

Capital Accumulation. Over the long term, in CBO's view, growth of the nation's stock of private capital is driven by private saving, international flows of direct foreign investment and financial capital, and federal borrowing. Private saving and international capital flows tend to move in tandem with the rate of return on investment—a rate that measures the extent to which investment in the stock of capital results in a flow of income. CBO's projection of that rate is consistent with the agency's projection that the average real interest rate on 10-year Treasury notes (calculated by subtracting the rate of increase in the consumer price index from the nominal yield on those notes) will be 1.1 percent in 2031 and 2.7 percent in 2051. CBO projects an increase in federal borrowing over the next 30 years, which will increase interest rates, thus reducing growth in private investment and tamping down growth in the stock of private capital.

Total Factor Productivity. The annual growth of TFP in the nonfarm business sector is projected to average 1.1 percent over the projection period. That projected growth rate is about 0.3 percentage points slower than the average annual rate since 1950 of 1.4 percent and 0.1 percentage point slower than the average rate since 1990.

CBO projects that nonfarm business TFP will grow more slowly than its long-term historical average for several reasons. Recent analysis of historical trends in TFP growth suggests that projections for the next few decades should place greater weight on slower recent growth than on faster growth in the more distant past. Thus, although CBO projects growth in nonfarm business TFP to accelerate from its unusually slow recent rate, the agency expects the future rate of growth to be slower than its long-term historical average.

A number of developments support CBO's projection of slower growth in nonfarm business TFP. One is the anticipated slower improvement in labor quality—an aggregate measure of workers' skills that accounts for educational attainment and work experience. That measure is implicitly included in CBO's measure of TFP. Labor quality improved rapidly during the 1980s and 1990s and more slowly after 2000. In CBO's assessment, that slowdown was the result of both a less-rapid increase in educational attainment and the continued retirement of members of the baby-boom generation, a large, experienced portion of the workforce. In future decades, however, the slower improvement in labor quality is expected to be partly offset by improvements in health

and increases in life expectancy that lead people (particularly highly educated people) to continue working past the ages at which previous generations retired (thus boosting the total stock of experience in the workforce).

Another development that affects nonfarm business TFP is federal investment in long-lived assets, such as buildings, roads, and intellectual property, which produce a stream of benefits to private businesses. In CBO's projections, federal discretionary spending declines to a much smaller percentage of GDP over the next decade than in past decades. If federal investment spending generally remains unchanged as a share of discretionary spending and discretionary spending declines as a percentage of GDP, federal investment spending will also decline as a share of GDP. In CBO's assessment, a reduction in federal investment spending as a share of GDP would dampen TFP growth.[12]

CBO also estimates the effects of climate change on economic growth in future decades, drawing on studies that relate differences in regional economic activity and growth to differences in regional weather patterns, as well as studies of the economic effects of more-intense storms and rising sea levels. Climate change affects the agency's projections in at least two ways. First, climate change has had a modest effect on recent productivity trends, in the agency's assessment. Because those recent trends are used to project future trends, CBO's projections thus account for a portion of the effects of climate change. Second, the agency explicitly estimates a certain amount of additional impact from future changes in climate, which are projected to affect the growth of nonfarm business TFP. By CBO's estimate, TFP growth over the 2021–2051 period will be lower by about 0.02 percentage points per year, on average; as a result, TFP will be about 0.7 percent less and GDP about 0.5 percent less in 2051 than the metrics would have been without those additional effects.

Real GDP per Hour Worked. Given the projected growth of the capital stock and TFP described above, real GDP per hour worked (a measure of economy-wide productivity) is expected to grow by an annual average of 1.3 percent over the 2021–2051 period. Potential labor force productivity (potential output per member of the potential labor force) is also expected

to grow by an annual average of 1.3 percent over the 2021–2051 period.

Changes in Projections of Capital Accumulation and Productivity Since Last Year. CBO's projections of capital accumulation are stronger over the first decade of the projection period but slightly weaker over the second and third decades than the agency expected last year. Its projections of TFP growth in the nonfarm business sector and real GDP per hour worked in the entire economy are both somewhat weaker over the entire period, mainly because the downturn in early 2020 was not as pronounced as the agency initially estimated and the recovery later in the year was stronger.

Inflation

CBO projects rates of inflation for two categories: prices of consumer goods and services and GDP prices (the price of all goods and services included in GDP). Those rates affect nominal (current-dollar) interest rates, income, and indexation of income tax brackets, thereby influencing tax revenues, federal expenditures that are indexed for inflation, and interest payments on federal debt.

Prices of Consumer Goods and Services. One measure of consumer price inflation is the annual rate of change in the consumer price index for all urban consumers (CPI-U). Over the 2021–2051 period, that measure of inflation averages 2.3 percent in CBO's projections. That long-term rate is roughly the same as the average rate of inflation since 1991. CBO projects that, under a chained measure of CPI-U inflation, prices will grow at a rate that is about 0.25 percentage points less than the annual increase in the traditional CPI-U.[13]

GDP Prices. Over the 2021–2051 period, inflation in GDP prices, as measured by the annual rate of increase in the GDP price index, is projected to average 2.0 percent. That rate is slightly higher than the average growth in the GDP price index over the past 30 years

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12. For more details about how CBO estimates the macroeconomic effects of federal investment, see Congressional Budget Office, *The Macroeconomic and Budgetary Effects of Federal Investment* (June 2016), www.cbo.gov/publication/51628.

13. The chained consumer price index for all urban consumers (CPI-U) tends to grow more slowly than the traditional CPI-U for two reasons. First, it uses a formula that better accounts for households' tendency to substitute goods and services with similar but cheaper alternatives when prices go up. Second, unlike the CPI-U, the chained CPI-U is little affected by statistical bias related to the sample sizes that the Bureau of Labor Statistics uses in computing each index. Historically, inflation as measured by the chained CPI-U has been about 0.25 percentage points lower, on average, than inflation as measured by the CPI-U. CBO's projections reflect that average difference between the two measures.

of 1.9 percent per year. The GDP price index grows at a different rate than the CPI-U because it is based on the prices of a different set of goods and services and is calculated using a different method.

Changes in Projections of Inflation Since Last Year. Inflation, as measured by growth in either the CPI-U or the GDP price index, is projected to be considerably higher from 2021 to 2031 than CBO projected last year. There are two reasons for that higher projection. First, inflation is projected to be higher in the short term because consumers and businesses have proven better able to adapt to social distancing—allowing spending on goods and services to continue—than the agency previously expected and because of laws enacted in 2020, both of which limit the disinflationary impact of the pandemic. Over the 2021–2025 period, CBO projects the CPI-U to grow at an average annual rate of 2.2 percent, more than the average of 1.9 percent the agency projected last year for the same period. Second, inflation is projected to be higher after the economy fully recovers from the 2020 recession because of the Federal Reserve's recent revision to its statement of goals and policies, which states that when there is a period in which inflation falls short of the Federal Reserve's objective, inflation will be allowed to moderately exceed that objective in a future period.[14] Over the 2026–2031 period, CBO projects the CPI-U to grow at an average annual rate of 2.4 percent, more than the average of 2.2 percent the agency projected last year for the same period.

CBO did not significantly revise its projection for later decades in the projection period. After 2031, inflation returns to its projected long-term average. CBO projects the CPI-U to grow at an average annual rate of 2.2 percent and the GDP price index to grow at an average annual rate of 2.0 percent, the same rates the agency projected last year.

Interest Rates

CBO projects the interest rates that apply to federal borrowing, including the rates on 10-year Treasury notes and special-issue Social Security bonds. It also projects the average interest rates on federal debt held by the public and on the bonds held in the Social Security trust funds. Those rates influence the cost of the government's debt burden and the balances of the trust funds.

CBO expects real interest rates on federal borrowing to be lower in the future than they were, on average, over the 1995–2004 period, the period CBO uses for historical comparison. The agency expects several factors, including slower growth in the labor force and slower growth in TFP relative to that historical period, to continue to put downward pressure on interest rates through 2051. That downward pressure is expected to be partly mitigated by upward pressure from other factors such as rising debt relative to GDP. The real interest rate on 10-year Treasury notes averaged roughly 3 percent between 1995 and 2004. That rate has averaged 0.7 percent since 2009 and is projected to be 1.1 percent in 2031. CBO projects the rate to rise thereafter, reaching 2.7 percent in 2051. That projection is 0.3 percentage points below the average real interest rate on 10-year Treasury notes over the 1995–2004 period.

CBO's current projections of real interest rates over the 2021–2050 period are roughly unchanged, on average, from last year's projections. Over the 2031–2050 period, the agency expects real interest rates to be slightly higher than last year's projection for reasons including an upward revision to CBO's forecast of the share of income paid to capital in coming decades. By 2050, the agency projects the real interest rate on 10-year Treasury notes to reach 2.6 percent, 0.1 percentage point higher than last year's projection.

Factors Affecting Interest Rates. Interest rates are determined by a number of factors. CBO projects those rates by comparing how the values of factors that affect them are expected to differ in the long term from their average values over the 1995–2004 period. That period was chosen for comparison because expectations of inflation were stable, there were no severe economic downturns or significant financial crises, and according to CBO's estimates, monetary policy was, on average, neutral—that is, the real federal funds rate—the interest rate that financial intitutions charge each other for overnight loans of their monetary reserves—was, on average, consistent with the economy's operating at full employment during that period.[15]

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14. See Board of Governors of the Federal Reserve System, "Federal Open Market Committee Announces Approval of Updates to Its Statement on Longer-Run Goals and Monetary Policy Strategy" (press release, August 27, 2020), https://go.usa.gov/xGXXn.

15. For further details on the factors affecting CBO's interest rate projections, see Edward N. Gamber, *The Historical Decline in Real Interest Rates and Its Implications for CBO's Projections*, Working Paper 2020-09 (Congressional Budget Office, December 2020), www.cbo.gov/publication/56891.

In CBO's estimates for the 2021–2051 period, several factors tend to reduce interest rates on government securities below their average from 1995 to 2004:

- The labor force is projected to grow much more slowly than it did from 1995 to 2004. Slower growth in the number of workers tends to increase the amount of capital per worker in the long term, reducing the return on capital and, therefore, also reducing the return on government bonds and other investments.[16]

- The share of total earnings received by higher-earning households is expected to be larger in the future than it was during the 1995–2004 period. Higher-income households tend to save a greater proportion of their income, so the difference in the distribution of earnings is projected to increase the total amount of saving available for investment, other things being equal. As a consequence, the amount of capital per worker is projected to rise and interest rates are expected to be lower.

- TFP is projected to grow more slowly in the future than it did from 1995 to 2004. For a given rate of investment, a lower rate of productivity growth reduces the return on capital and results in lower interest rates, all else being equal.

- CBO expects investors' preference for Treasury securities over riskier assets to remain greater than it was during the 1995–2004 period. Investors began to have less appetite for risk in the early 2000s, and the demand for low-risk assets was strengthened by the economic fallout from the 2007–2009 recession, the slow expansion that followed, and the response of financial institutions to increased regulatory oversight. The 2020 recession further increased investors' demand for Treasury securities instead of riskier assets. That greater demand contributed to lower interest rates for Treasury securities. CBO expects the preference for Treasury securities to gradually decline over the next three decades but to remain stronger than it was from 1995 to 2004.

At the same time, in CBO's estimates, several factors tend to boost interest rates on government securities above their average over the 1995–2004 period:

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16. For more information about the relationship between the growth of the labor force and interest rates, see Congressional Budget Office, *How Slower Growth in the Labor Force Could Affect the Return on Capital* (October 2009), www.cbo.gov/publication/41325.

- In CBO's extended baseline projections, federal debt is much larger as a percentage of GDP than it was before 2004, reaching 107 percent by 2031 and 202 percent by 2051. The latter figure is more than five times the average over the 1995–2004 period. Greater federal borrowing tends to crowd out private investment in the long term, reducing the amount of capital per worker and increasing both interest rates and the return on capital over time.

- The capital share of income—the percentage of total income that is paid to owners of capital—has been rising for the past few decades. That share is projected to decline from its current percentage over the next decade but to remain greater than its average in previous decades. The factors that appear to have contributed to capital's rising share of income (such as technological change and globalization) are likely to persist, keeping it above the historical average. In CBO's estimation, a larger share of income accruing to owners of capital would directly boost the return on capital and thus would increase interest rates.

- The retirement of members of the baby-boom generation and slower growth in the size of the labor force means that there will be fewer workers in their prime saving years relative to the number of older people who are drawing down their savings. As a result, CBO estimates that the total amount of saving available for investment will be less than it otherwise would be (all else being equal) and expects that decrease to reduce the amount of capital per worker and thereby push up interest rates. (CBO estimates that the effect of that decrease will only partially offset the positive effect of the larger share of earnings received by high-income households, leaving a net increase in saving available for investment.)

- CBO anticipates that emerging-market economies will attract a greater share of foreign investment in coming decades than they did in the 1995–2004 period. The agency expects that as those economies recover from the global economic downturn caused by the pandemic, they will become increasingly attractive destinations for foreign investment. CBO projects the increased appeal of investing in emerging markets to put upward pressure on interest rates in the United States.

Some factors mentioned above are easier than others to quantify. For instance, the effect of labor force growth and rising federal debt can be estimated from available

data by using theoretical models and the findings of existing research. The extent to which other factors affect interest rates is more difficult to estimate. A shift in preferences for low-risk rather than high-risk assets is not directly observable, for example. That shift is especially uncertain in light of the unprecedented increase in federal debt in response to the pandemic and recession. It is difficult to anticipate how financial markets will respond to that rising debt once the economy begins to recover. The effect on interest rates of changes in the distribution of earnings is also difficult to quantify.

In light of those sources of uncertainty, CBO relies not only on economic models and findings from the research literature but also on information from financial markets to guide its assessments of the effects of various factors on interest rates over the long term. The current rate on 30-year Treasury bonds, for example, reflects market participants' judgments about the path that interest rates on short-term securities will take 30 years from now. The low rate on 30-year Treasury bonds since the onset of the 2020 recession points to expectations that interest rates will be considerably lower well into the future than they were from 1995 to 2004.

Projections of Interest Rates. The nominal interest rate on 10-year Treasury notes is projected to average 3.5 percent over the 2021–2051 period and to reach 4.9 percent in 2051. The real interest rate on 10-year Treasury notes is projected to average 1.3 percent over that period and to be 2.7 percent in 2051.

The average interest rate on all federal debt held by the public (Treasury securities) tends to be lower than the rates on 10-year Treasury notes because other Treasury securities generally mature over a shorter period and their interest rates are therefore lower.[17] CBO projects a 0.5 percentage-point difference between the rate on 10-year Treasury notes and the average interest rate on federal debt over the 2021–2051 period. That difference is projected to average 0.8 percentage points over the next decade. The difference is larger before 2031 because the federal debt up to that time includes Treasury securities that were issued during the 2020 recession. That difference decreases to 0.3 percentage points by 2036 and remains at the same level in later years as earlier securities with relatively low interest rates mature, in

CBO's projections. The same factors that increase interest rates also increase the average interest rate on federal debt held by the public between 2041 and 2051. In CBO's projections, the average nominal interest rate on federal debt held by the public is about 2.9 percent for the 2021–2051 period, reaching 4.6 percent in 2051.

The Social Security trust funds hold special-issue bonds that generally earn interest at higher rates than the average rate of interest on federal debt. In CBO's projections, the nominal interest rate on bonds newly issued to the trust funds is equal to the rate on 10-year Treasury notes; it averages 3.5 percent over the 2021–2051 period and reaches 4.9 percent in 2051. The corresponding real rates are 1.3 percent, on average, over the full period, and 2.7 percent in 2051.

For two reasons—because interest rates have been low for much of the past decade and because the pandemic has driven rates even lower—CBO projects that the average interest rate earned by all bonds held by the Social Security trust funds (including those issued in the future) is slightly lower than the interest rate on bonds issued over the next decade. The average interest rate on all bonds, which CBO uses to calculate the present value of future streams of revenues and outlays for those funds, is projected to average 3.3 percent for the 2021–2051 period.[18]

Changes in Projections of Interest Rates Since Last Year. CBO's projections of interest rates in this year's long-term budget outlook are slightly higher than they were last year.

CBO raised its projection of average nominal interest rates. The nominal rates on 10-year Treasury notes and Social Security bonds are projected to average 3.5 percent over the 30-year projection period. Last year, CBO projected both rates to average 3.3 percent over the 30-year period. The agency also raised its projection of average real interest rates. The real rates on 10-year Treasury notes and Social Security bonds are projected to average 1.3 percent over the 30-year projection period. Last year, CBO projected both rates to average 1.1 percent over the 30-year period.

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17. Over the next decade, CBO expects the difference between the rate on 3-month Treasury bills and the rate on 10-year Treasury notes to average 0.8 percentage points.

18. A present value is a single number that expresses a flow of past and future income or payments in terms of an equivalent lump sum received or paid at a specific time. The value depends on the rate of interest, known as the discount rate, that is used to translate past and future cash flows into current dollars at that time.

CBO's projections of higher average interest rates over the coming decade are primarily the result of the faster-than-expected recovery from the 2020 recession. CBO now expects the Federal Reserve to begin raising short-term rates in the second half of 2024, almost two years earlier than previously projected. In addition, the agency now expects the Federal Reserve to begin reducing its holdings of Treasury and other securities earlier than it forecast last year. That reduction is expected to put upward pressure on the term premium—the extra return paid to bondholders for the greater risk associated with holding long-term Treasury securities.

After 2031, CBO projects higher interest rates because of its revisions to other factors that affect those rates. CBO expects the share of income paid to capital to be higher than the agency forecast last year. That increased share of income is expected to put upward pressure on interest rates. Toward the end of the projection period, 2046 to 2050, the agency expects the growth rate of the labor force to be slightly slower than in last year's projections. The slower growth rate is expected to put downward pressure on real interest rates. The net effect of the revisions to those factors is a small upward revision to real interest rates over the 2031–2051 period.