How CBO Develops the Economic Projections Underlying Its Long-Term Budget Projections

Presentation to the Social Security and
Medicare Trustees Working Group

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CBO makes baseline budget projections covering the next 10 years and also the next 30 years. Underlying those budget projections are **economic projections.**

The budget and economic projections incorporate the assumption that current laws generally do not change.

CBO calls its 30-year budget projections "long-term projections" or "the extended baseline."

For years 1 through 10, the economic projections underlying the extended baseline are identical to the agency's most recent 10-year economic projections.
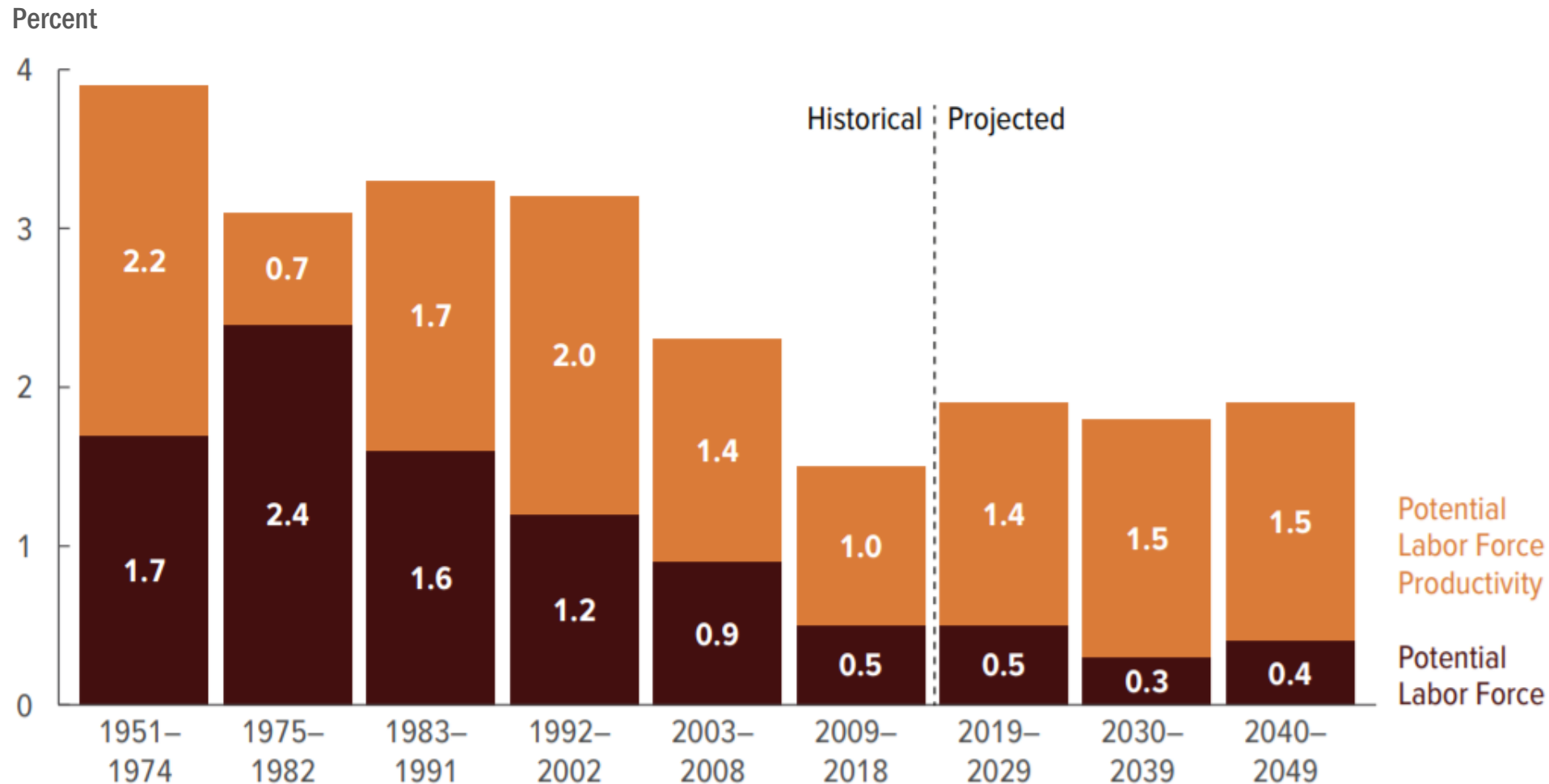
Average Annual Values for Demographic Variables That Underlie CBO's Extended Baseline

	1989–2018	2019–2029	2030–2039	2040–2049	Overall, 2019–2049
Growth of Population (Percent)	0.9	0.6	0.5	0.4	0.5
Contribution to Population Growth (Percentage points):					
Births	1.4	1.2	1.2	1.2	1.2
Net immigration	0.4	0.3	0.3	0.3	0.3
Deaths	-0.9	-0.9	-1.0	-1.1	-1.0
Growth of Civilian Noninstitutionalized Population (Percent)[a]	1.1	0.8	0.5	0.4	0.6
Memorandum:					
Fertility Rate (Children per woman)	2.0	1.9	1.9	1.9	1.9
Life Expectancy at Birth, End of Period (Years)[b]	78.9	80.3	81.4	82.5	82.5
Life Expectancy at Age 65, End of Period (Years)[b]	19.4	20.1	20.8	21.5	21.5
Immigration Rate (Per 1,000 people in the U.S. population)	3.7	3.1	3.1	3.1	3.1

Source: Congressional Budget Office, *The 2019 Long-Term Budget Outlook* (June 2019), Table A-1, www.cbo.gov/publication/55331.

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

	1989–2018	2019–2029	2030–2039	2040–2049	Overall, 2019–2049
Growth of GDP					
Real GDP[a]	2.5	1.8	1.8	1.9	1.9
Nominal GDP (Fiscal year)	4.7	4.0	3.8	3.9	3.9
Real GDP per Person	1.6	1.2	1.3	1.5	1.3
Growth of the Labor Force	1.0	0.5	0.3	0.4	0.4
Labor Force Participation Rate	65.5	62.0	60.3	59.7	60.7
Unemployment					
Unemployment rate	5.9	4.5	4.6	4.5	4.5
Natural rate of unemployment	5.1	4.5	4.4	4.2	4.4
Growth of Average Hours Worked	-0.1	*	*	*	*
Growth of Total Hours Worked	0.9	0.4	0.3	0.4	0.4
Earnings as a Share of Compensation	81	81	81	81	81
Growth of Real Earnings per Worker	0.9	1.2	1.1	1.0	1.1
Share of Earnings Below the Taxable Maximum	85	82	81	80	81
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[a]	1.6	1.4	1.5	1.5	1.5
Labor force productivity[b]	1.5	1.3	1.5	1.5	1.4

Average Annual Growth of Real Potential GDP in CBO's Extended Baseline

Percent

Historical | Projected

Potential Labor Force Productivity

Potential Labor Force

Period	Potential Labor Force Productivity	Potential Labor Force
1951–1974	2.2	1.7
1975–1982	0.7	2.4
1983–1991	1.7	1.6
1992–2002	2.0	1.2
2003–2008	1.4	0.9
2009–2018	1.0	0.5
2019–2029	1.4	0.5
2030–2039	1.5	0.3
2040–2049	1.5	0.4

Growth in potential gross domestic product (GDP) is projected to be slower than it has been in the past, driven mostly by slower growth of the labor force.

The Congressional Budget Office Long-Term Model, known as CBOLT, is the main analytical tool that the agency uses to make its long-term projections.

It consists of four components:

- A demographic model

- A microsimulation model that projects year-to-year changes in demographic characteristics and economic outcomes for individuals

- A long-term budget model that projects federal outlays, revenues, deficits, and debt beyond CBO's standard 10-year budget period

- A **policy growth model** that produces the economic projections that underlie the extended baseline

At its core, the **policy growth model** relies on a standard economic framework called the Solow growth model. That model focuses on the inputs that drive growth in the supply side of the economy:

- The amount of **labor** (measured in terms of the number of hours worked)

- The productive services provided by **capital** (including physical capital, such as plants and equipment, as well as more abstract types of capital, such as intellectual property)

- **Total factor productivity (TFP) in the nonfarm business sector**—which is often characterized as a measure of technological progress but is actually a measure of unexplained growth that reflects all economic developments other than the growth of labor and capital

In the policy growth model, the Solow model takes the form of a Cobb-Douglas production function relating output to the growth of the factors described above as well as to labor's and capital's share of total income.

For years 11 to 30, **CBO uses its policy growth model to make projections of how the economy would behave if current laws generally did not change.**

That model first takes projections of **key economic inputs** under the assumption that beginning in year 10:

- Effective average and marginal tax rates are held fixed,

- Debt as a share of GDP does not rise over time, and

- Other scheduled changes in spending and revenues under current law also have no effect on the economy.

In addition to the key economic inputs, the policy growth model incorporates two more sources of information:

- Projected demographic variables

- Changes to spending and revenues as scheduled under current law

Because CBO projects the **key economic inputs** under the assumption that scheduled changes in spending and revenues have no effect on the economy, the policy growth model has a starting point before it takes into account the ways in which scheduled changes in spending and revenues under current law *would* affect the economy and in turn the budget.

The **projected key economic inputs** include:

- TFP in the nonfarm business sector

- Labor force participation

- The unemployment rate

- The consumer price index for urban consumers, or CPI-U

- The GDP price index

- Interest rates on Treasury notes and special-issue Social Security bonds

- Average hours worked

- Earnings inequality

- Earnings as a share of compensation

The projections of those inputs are based on historical trends, empirical analysis, demographic projections, and expert feedback.

Taking the key economic inputs (under the assumption that spending and revenues under current law have no effect on the economy), the demographic projections, and scheduled changes in spending and revenues under current law, the policy growth model produces the economic projections that underlie the **extended baseline.**

Those economic projections underlying the extended baseline incorporate the effects of federal tax and spending policy and federal borrowing on saving, interest rates, capital stocks, the labor force, and inflows of foreign capital.

Economic variables projected by the policy growth model include:

- GDP

- The labor force

- Labor productivity

- Average hours worked

- Earnings as a share of compensation

- Real earnings per worker

- Labor's and capital's share of total income

- Real and nominal interest rates on Treasury notes and special-issue Social Security bonds

Most economic variables that underlie the extended baseline are projected to be relatively stable in the long term.

CBO begins to formulate the 30-year economic projections that will underlie the extended baseline as it creates the 10-year economic projections.

For most economic variables, the 10-year projection **phases smoothly into the long-term projection.**

An example of a projected key economic input is the growth of TFP in the nonfarm business sector.

In the past, TFP has been marked by long periods of relatively steady growth followed by abrupt transitions to substantially different rates of growth.

In CBO's current projections for the next 10 years, the growth of TFP gradually increases from its recent low rate to a higher rate that is more consistent with such long-term trends.

The growth of TFP is projected to reach the rate that equals its weighted average from the preceding 25 years. (Twice as much weight is placed on recent rates as on rates 25 years in the past.)

Weighted 25-Year Moving Average of TFP in the Nonfarm Business Sector

The weighted **25-year moving average of the growth of potential TFP** equaled 1.1 percent in 2018.

To project the growth of TFP beyond the next decade, CBO uses a different approach. That approach suggests that TFP will continue to grow at a rate of 1.1 percent.

For that longer-term projection, CBO looks farther into the past than the preceding 25 years. Since 1950, TFP growth has averaged 1.5 percent. But with the exception of brief periods, TFP has grown more slowly in recent decades than it did during the 1950s and 1960s; since 1990, TFP growth has averaged a little more than 1.2 percent.

CBO projects that after the next decade, TFP growth will be slightly less than its average rate since 1990 and considerably less than its longer-term average. That projection reflects several considerations:

▪ A slowing of growth in labor quality, a measure of workers' skills that accounts for educational attainment and work experience

▪ A projected reduction in spending for federal investment under current law

Projected TFP in the Nonfarm Business Sector
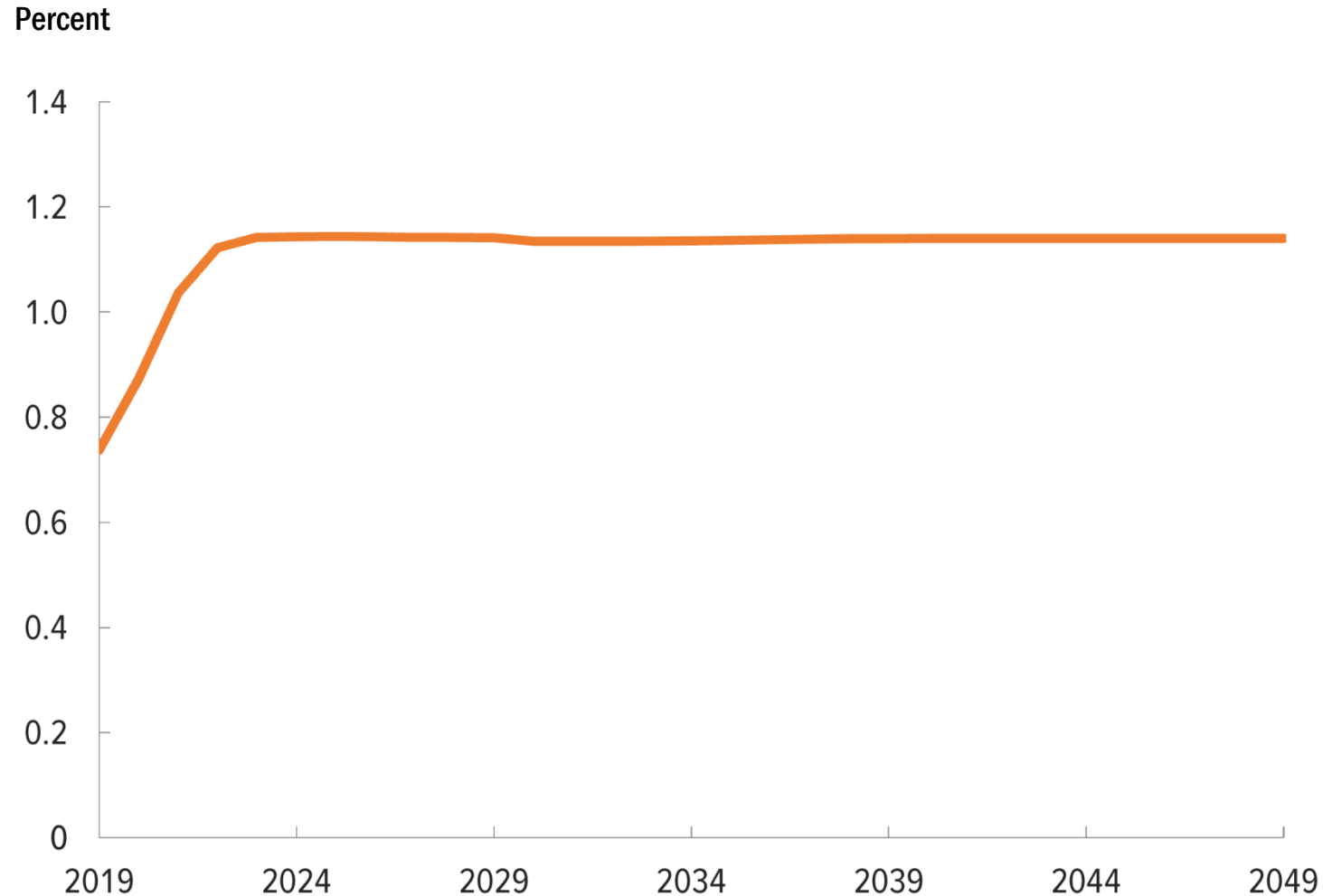
Percent

The growth of **TFP** is expected to rise to 1.1 percent over the next few years and then remain at that level through 2049.

Growth of Real GDP per Hour Worked
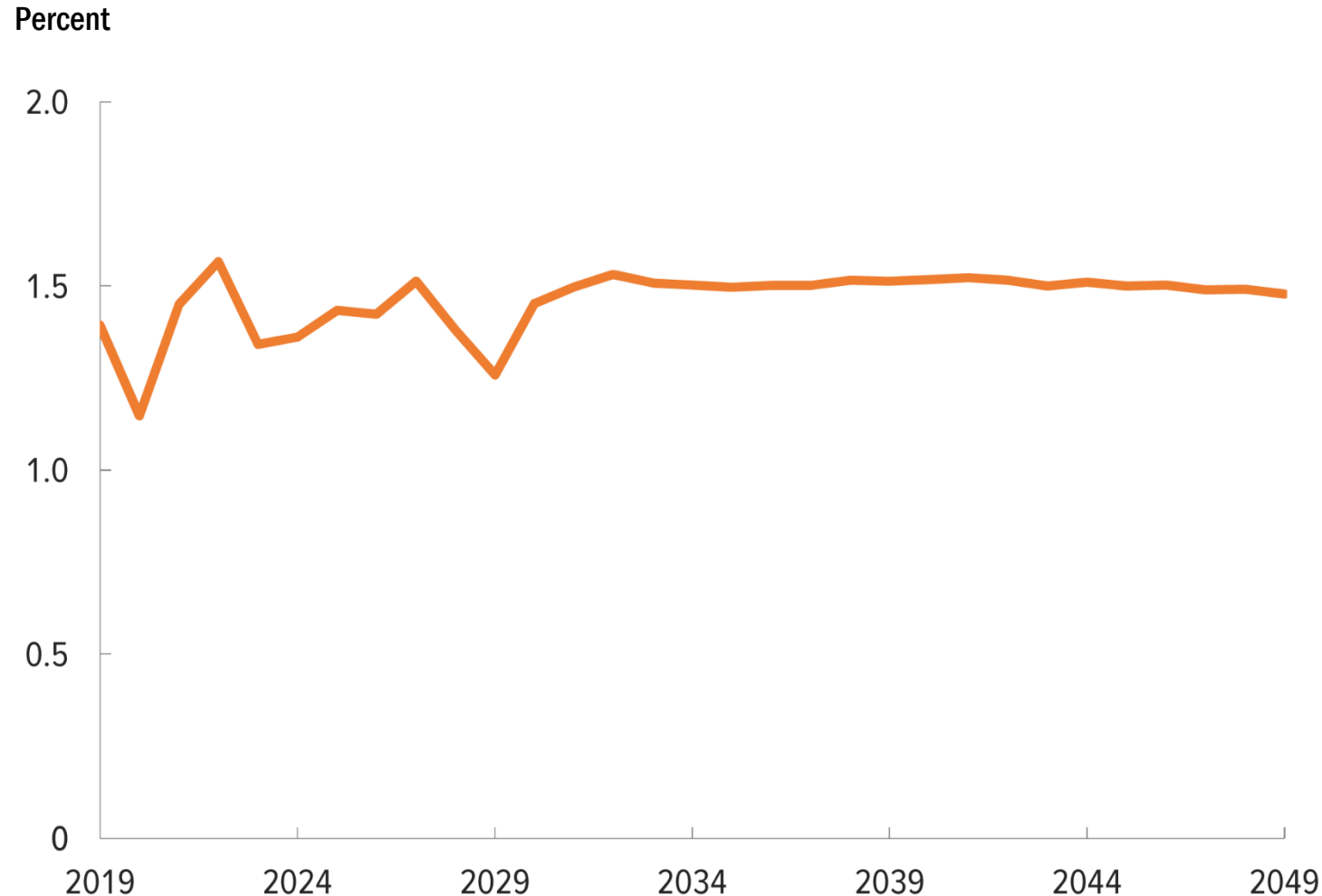
Percent

Taken together, CBO's projections of labor supply, capital services, and TFP result in annual **growth of real GDP per hour worked** that is expected to average 1.5 percent over the 2019–2049 period.

Another example of a projected key economic input is growth in **earnings inequality.**

Growing wage inequality has increased the share of earnings that is above the maximum taxable level for the Social Security payroll tax and thus reduced the **share of earnings that is taxable for Social Security.** (Because of the progressive rate structure of the income tax, however, that increase in high earnings has produced an increase in individual income tax receipts that has more than offset the decrease in payroll tax receipts.)

CBO apportions shares of total wage growth to earners across the distribution of wages. It uses CBOLT to project the share of total earnings below that maximum that is taxable for Social Security.

# Wage Income by Decile as a Share of All Wages
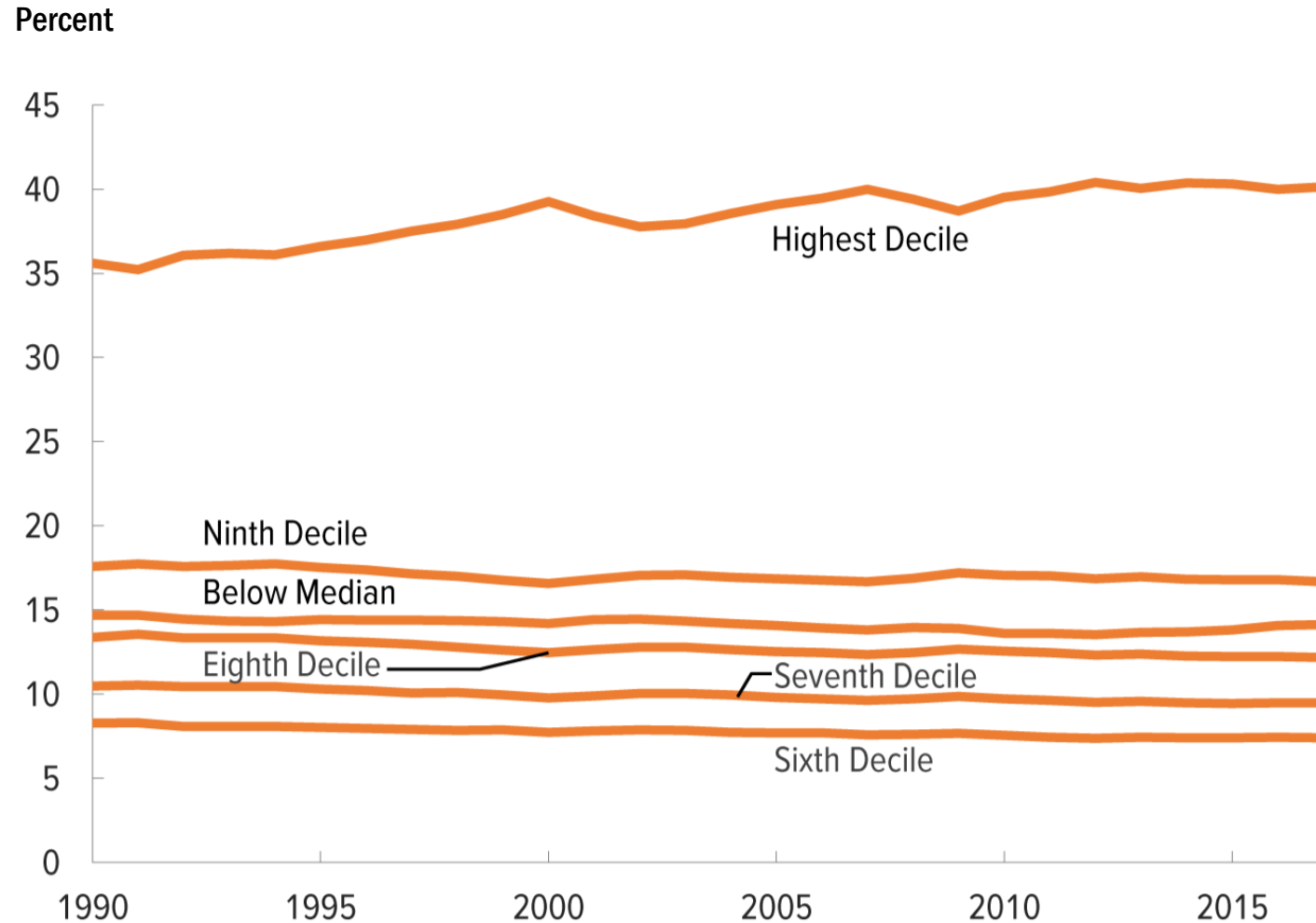
The share of wages going to each decile has been largely flat, except for the highest decile. And within the highest decile, the top 1 percent saw the largest increase.

Share of Wages Earned by the Top 1 Percent of Wage Earners
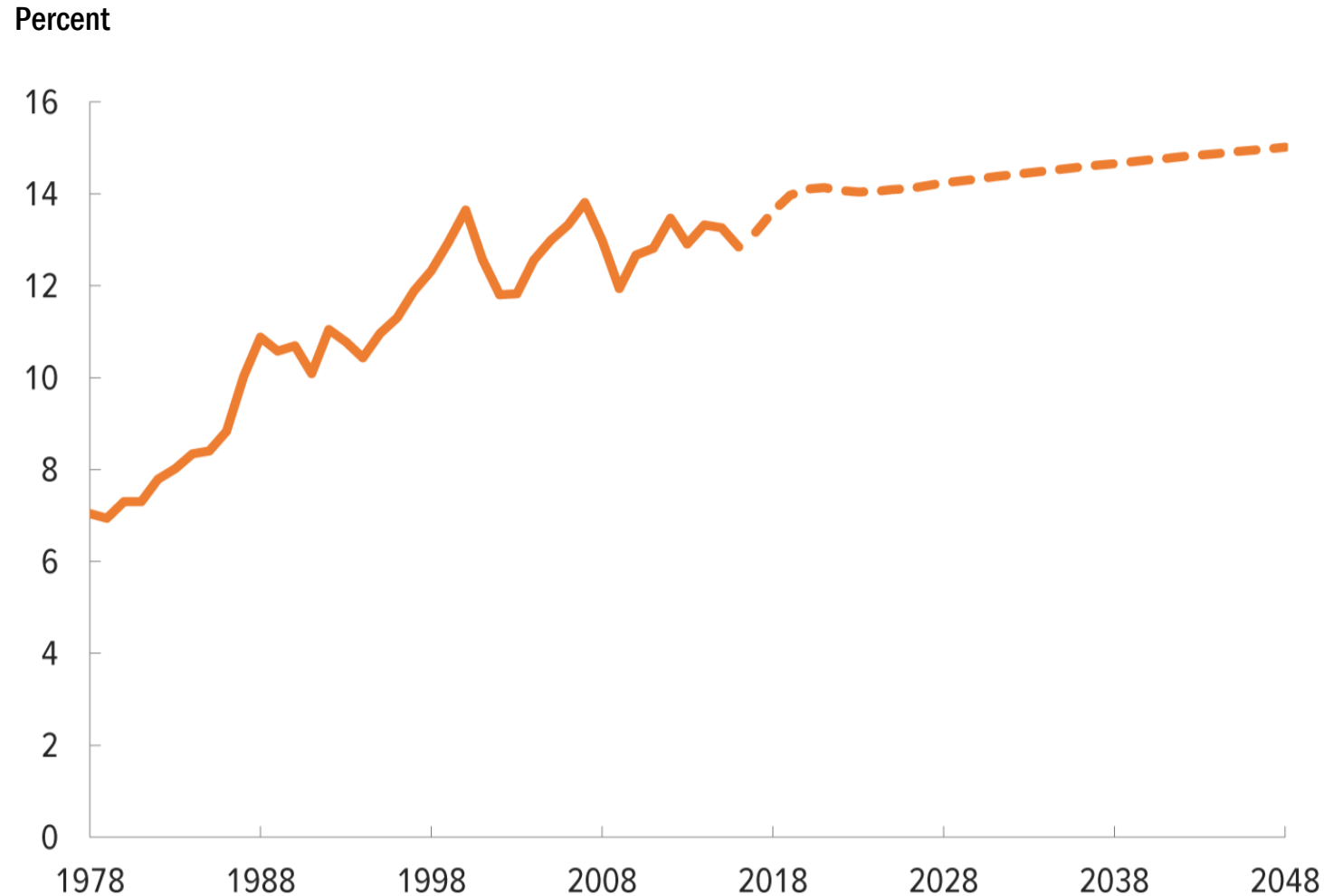
Percent

To make its longer-term projection of the **share of wages earned by the top 1 percent of wage earners,** CBO uses the values produced by a statistical model that employs a time trend and an estimate of slack in the economy.

Share of Earnings That Is Taxable for Social Security

Percent
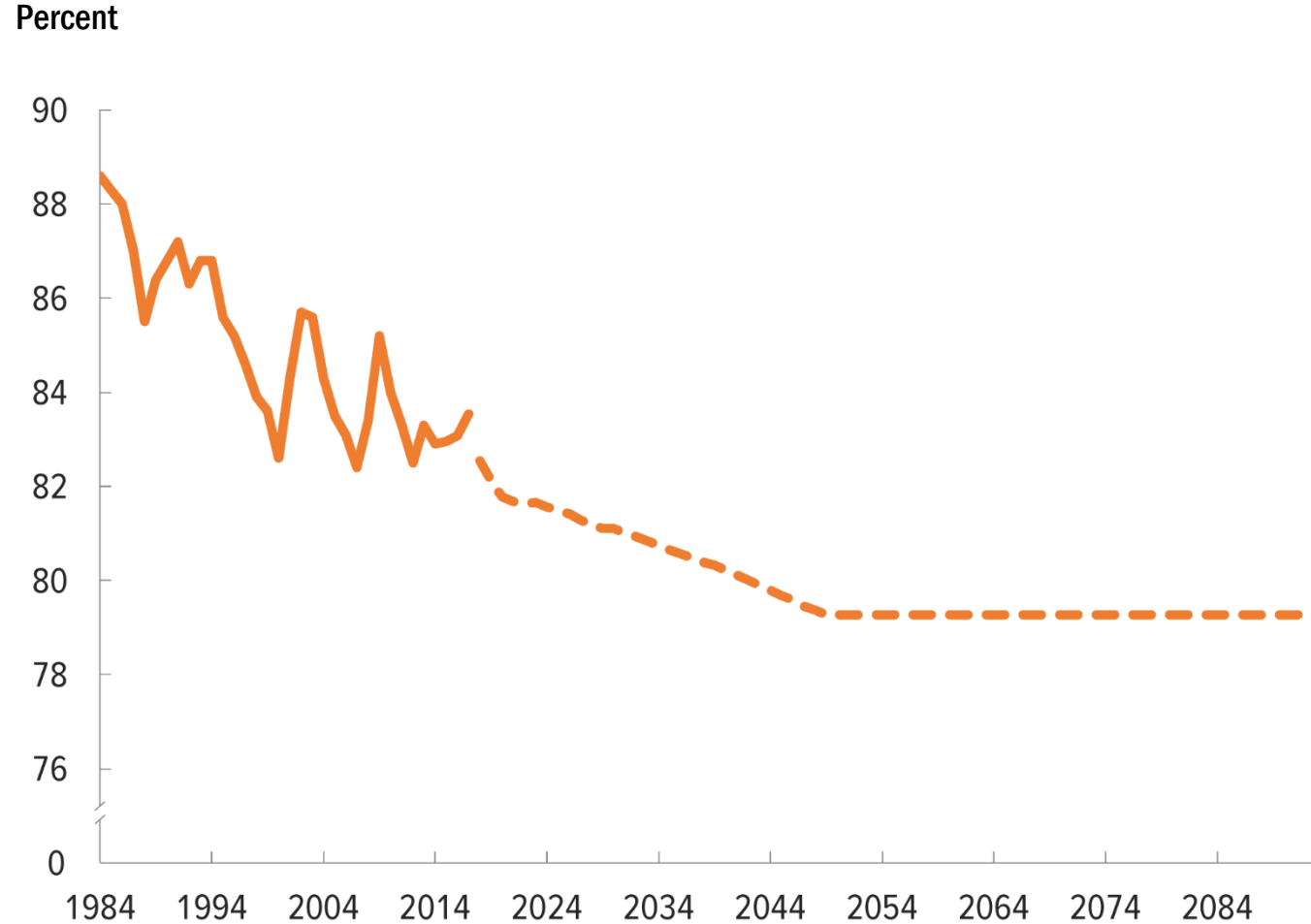
The projected **share of earnings that is taxable for Social Security** declines through 2049 as the share of wages earned by the top earners increases. In the final 45 years of CBO's 75-year projection, that share remains constant.

Related Work by CBO

The 2019 Long-Term Budget Outlook (June 2019), Appendix A, www.cbo.gov/publication/55331.

CBO's Long-Term Social Security Projections: Changes Since 2017 and Comparisons With the Social Security Trustees' Projections (December 2018), www.cbo.gov/publication/54711.

An Overview of CBOLT: The Congressional Budget Office Long-Term Model (April 2018), www.cbo.gov/publication/53667.

Joshua Montes, *CBO's Projection of Labor Force Participation Rates*, Working Paper 2018-04 (March 2018), www.cbo.gov/publication/53616.

Robert Shackleton, *Estimating and Projecting Potential Output Using CBO's Forecasting Growth Model*, Working Paper 2018-03 (February 2018), www.cbo.gov/publication/53558.