



---

# 2019 TECHNICAL PANEL ON ASSUMPTIONS AND METHODS

---

REPORT TO THE SOCIAL SECURITY ADVISORY BOARD

## **EXECUTIVE SUMMARY**

SEPTEMBER 2019

## Members of the Technical Panel

### **Robert M. Beuerlein**, Chair

Consulting actuary with RM Beuerlein Consulting and recently retired Senior Vice President and Chief Actuary of AIG Life and Retirement Companies; fellow of the Society of Actuaries, a member of the American Academy of Actuaries, and a Chartered Enterprise Risk Analyst; past president of the American Academy of Actuaries (2017) and the Society of Actuaries (2006)

### **Ron Gebhardtsbauer**

Professor Emeritus in the Actuarial Science Program, Penn State University. Fellow of the Society of Actuaries, Member of the American Academy of Actuaries

### **Alexander Gelber**

Associate Professor, Department of Economics and School of Global Policy and Strategy, University of California, San Diego

### **Joshua Goldstein**

Chancellor's Professor of Demography, University of California, Berkeley

### **Patricia L. (Tricia) Guinn**

Director, Reinsurance Group of America, Inc. and Assetmark Financial Holdings, Inc.; fellow of the Society of Actuaries; member of the American Academy of Actuaries; Chartered Enterprise Risk Analyst; and previously interim chief risk officer and managing director, Risk and Financial Services, Willis Towers Watson

### **Kathleen Mullen**

Senior Economist, RAND Corporation and Director, RAND Center for Disability Research.

### **Louise Sheiner**

Robert S. Kerr Senior Fellow in Economic Studies, Brookings Institution, and policy director, Hutchins Center on Fiscal and Monetary Policy

### **Sita Nataraj Slavov**

Professor of Public Policy and Director of the public policy Ph.D. program, Schar School of Policy and Government, George Mason University

### **Kent Smetters**

Boettner Chair Professor, Wharton School, University of Pennsylvania, and Faculty Research Fellow, National Bureau of Economic Research

### **Tom Terry**

CEO of the Terry Group. Fellow of the Society of Actuaries, Member of the American Academy of Actuaries, fellow of the Conference of Consulting Actuaries, Enrolled Actuary, past president of the American Academy of Actuaries (2014) and the International Actuarial Association (2017)

# 2019 TECHNICAL PANEL ON ASSUMPTIONS AND METHODS

## **EXECUTIVE SUMMARY**

Report to the  
Social Security Advisory Board  
September 2019

## Executive Summary

The Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance (OASI) and Federal Disability Insurance (DI) Trust Funds is produced each year to report on the actuarial status and the financial condition of the Trust Funds as required by law. The development of the report follows a complex process that involves a detailed financial projection of the Social Security system's future cash flows. The process has been effective historically in providing important information relevant to the financial condition of the trust funds.

The 2019 Technical Panel on Assumptions and Methods was created by the Social Security Advisory Board in September 2018 with a charter to:

- Review the key economic and demographic assumptions underlying the Trustees Report, assess whether they are reasonable, and detail the rationale for considering alternative values.
- Review the current projection methods, assess whether they are reasonable and appropriate, and detail the rationale for considering new methodologies.
- Consult with the board, the Trustees, and the Office of the Chief Actuary (OCACT) regarding specific assumptions or methods that may benefit from additional attention from the Panel.
- Review ways to improve the presentation of key concepts in the Trustees Report so as to make them more accessible and informative to policymakers and the public.

The Technical Panel was focused particularly on the likely increased demands on OCACT as the date of trust fund depletion nears and potential changes to Social Security receive heightened attention. This report makes recommendations that are intended to enhance OCACT's ability to evaluate the potential future financial status of the Social Security system under current law and a wide variety of proposed system reforms in a robust and timely manner and to better convey its findings - and the range of uncertainty around those findings - to stakeholders. The analysis and results contained in the Trustees Report are reasonable and meaningful for today. The recommendations contained herein are intended to position the Trustees Report to take advantage of evolving techniques and tools in order to be equally meaningful and insightful going into the future.

This report is not just forward looking. The Technical Panel also spent significant time analyzing the assumptions and methods that were utilized in the 2018 and 2019 Trustees Reports. While the Panel concluded that the Trustees' assumptions are not unreasonable, we believe that there is evidence to support further changes in some of the assumptions, especially if experience continues as recently observed. A good example of this is the long run unemployment rate assumption and the related assumption of disability incidence, as the recent experience of low unemployment levels combined with low inflation has convinced many experts that the natural rate of unemployment will be lower in the coming years.

Further, each assumption must not be viewed in a vacuum as the interrelationships among the assumptions is vital.

The comments and recommendations herein represent the considered thoughts of a diverse group of experts from the fields of actuarial science, demography and economics. Professional judgment is an essential element of the Trustees' projections. Our independent review seeks to contribute to the body of actuarial, demographic and economic thinking that will inform this professional judgment in the years ahead. The Panel believes that the choice of assumptions and methods in any projection model can and

does vary among honest and dedicated professionals. The willingness of the Trustees and Chief Actuary to open up their projections to detailed scrutiny and consider the recommendations of independent experts is a positive feature that should increase the public's confidence in the projections. The Panel considered a full range of views on the various assumptions underlying the Trustees' projections. For illustrative purposes, the impact of the Panel's consensus recommendations is shown in a supplemental report on the SSAB website: [www.ssab.gov](http://www.ssab.gov).

This report is the culmination of nearly nine months of collaborative research by the Technical Panel. It includes the Panel's observations and recommendations regarding:

- A roadmap for **modernizing the technology** supporting the financial projections;
- Ideas for **improving public understanding** of the key drivers of the financial status of the Old Age, Survivors and Disability Insurance (OASDI) system;
- Recommendations for changes in the **economic, demographic and program-specific assumptions** underlying the OASDI projections; and
- Suggestions for directly incorporating the **uncertainty** inherent in many of the assumptions into the methods underlying the Trustees' projections.

Our conclusions are the result of a detailed review of the 2018 and 2019 Trustees Reports and after working closely with the Chief Actuary and his staff, consulting with staff representing the four ex-officio Trustees, congressional committees, and the Congressional Budget Office (CBO), and speaking with numerous academic and private sector experts. During our discussions, the relative importance of topics for which the Technical Panel might provide meaningful impact and offer insight progressed to prioritize methods and presentation over assumptions. In other words, insights into modern financial modeling techniques and technologies (methods), as well as the effective presentation of the results to policymakers, the media and the public (presentation), became the significant focus of the Panel. Throughout the process, our deliberations were informed by regular discussions with the OCACT, including a meeting of the Technical Panel at the OCACT's office in Baltimore.

Throughout the Technical Panel report, recommendations are presented regarding methods, presentation, and demographic, economic and program-specific assumptions associated with the Trustees Report. These recommendations should not be viewed as criticisms of the Trustees or OCACT. Rather, the recommendations present opportunities that were identified by the independent Panel for enhancements and modifications to ensure that the Trustees and OCACT can continue to effectively provide this essential information to policymakers and the public on this vitally important program. While some specific recommendations regarding assumptions are presented within the report, equally important are the explanations and rationale for considering alternative assumptions that are also presented. Further, the important role of professional judgment in determining assumptions and methods is acknowledged.

For many years, the Trustees Report has predicted that the Trust Funds will be depleted in the early 2030s as the Baby Boom generation retires and the ratio of the working age population to the retired population falls. Significant reforms will need to be enacted before the depletion date to avoid disruption to the system and lives of millions of Americans who depend on Social Security for their retirement income. While the Panel did not speculate on the details of what reforms might be enacted, we envision that numerous and varied proposals will be debated and there will be a growing need for timely and effective information to policymakers, the media and the public. More specifically, this

report provides commentary and recommendations about supplementing and in some cases replacing existing methods and processes with more recently developed techniques and technology. The report also recognizes the importance of effectively communicating these complex issues to all stakeholders, ranging from policymakers to the general American public.

## Methods

The methods and techniques employed by OCACT have worked well over the history of the Trustees Report. Changes to methods have occurred incrementally in response to expanding needs and demands on the Trustees Report for more information. This incremental approach is a well-accepted method for updating systems and methodologies each year. However, in this age in which the ability to amass and analyze vast amounts of data continues to grow exponentially, organizations across the public and private sectors have found it necessary to occasionally embark on an episodic effort of process reengineering and technology refreshment in addition to routine, incremental improvements.

With the maturation of the Baby Boom generation and all related impacts on the OASDI system, the Board of Trustees and OCACT will almost certainly be called upon to perform analyses that will strain the ability of OCACT's current techniques and technology to respond in a robust and timely fashion.

We therefore recommend commencement of a modernization effort that takes full advantage of today's ability to process more data, faster. Our modernization recommendations summarized below seek to ensure that the OCACT's good work will continue in the years ahead, both leading up to and after potential system reforms.

**Methods Recommendation 1: Model refresh.** The Panel recommends that OCACT reengineer and rebuild their computation model(s) using a programming language that supports object-oriented programming (e.g., Python, R, C++) which can be run in a modern environment that includes parallel processing (e.g., cloud processing), automates testing/validation and that streamlines and eliminates many of the manual handoffs between team members that exist today. We recommend that OCACT be given the budget and access to outside experts to begin this multi-year effort now.

**Methods Recommendation 2: Expand use of microsimulation techniques.** The Panel recommends OCACT develop and maintain a core microsimulation model as part of an expanded projection toolbox.

**Methods Recommendation 3: Administrative data.** The Panel recommends expanding the use of available government administrative data to refine and improve OCACT's projections, including of labor force outcomes and household benefit payments.

**Methods recommendation 4: Dynamic effects.** The Panel recommends that OCACT investigate the dynamic impact of potential policy changes and what-if scenarios on the macro-economy, including areas such as capital formation, the payroll tax base, wage growth, and wage-indexed benefits and incorporate such effects in the Trustees Report as appropriate.

**Method Recommendation 5: Statistical methods.** The Panel recommends incorporating recently developed statistical methods when estimating expected outcomes as well as future uncertainty.

**Methods recommendation 6: Current law.** The Panel recommends that projections make consistent assumptions about non-OASDI variables that reflect best projections of future values *or* current law but should avoid mixing the two sets of assumptions within the same projection.

## **Presentation**

There have been minimal changes to the OASDI system since 1983 except for the 1994 and 2015 reallocations of payroll taxes between the DI and OASI trust funds. However, the nuances inherent in the Trustees Report regarding the trust fund and the 75-year actuarial balance have been of little practical consequence to readers of the report. Thus, for the last 30+ years, the Trustees have issued their report with little fanfare and the media dutifully has reported on a trust fund depletion date that is poorly understood by most Americans.

The next fifteen years will be different. With the depletion of the trust fund reserves drawing ever nearer, the time available to enact changes to avert disruption and assure the long-term financial health of the system is shrinking. The discussions among policymakers and the public at large preceding the passage of reforms will be accompanied by a growing appetite for more information and greater understanding about the Social Security system.

The Panel believes that trust in public institutions is enhanced by greater understanding. Social Security is part of the bedrock of our institutions, accounting for nearly a quarter of Federal government expenditures. In this context, we believe it is paramount for the Trustees to communicate clearly and effectively with the general public about its finances.

Our recommendations revolve around improving the accessibility and transparency of the Trustees Report. In addition to meeting the needs of sophisticated audiences on the status of the trust fund relative to previous years, we recommend putting greater focus on communicating with readers who come to the Trustees Report afresh and without deep experience or knowledge although many of our recommendations would improve accessibility and transparency for those well versed in the Trustees Report as well.

We make several communications recommendations designed to improve understanding of the system's finances. The main theme is that the Trustees Report should be broadly accessible and transparent to Americans without specialized knowledge of the Social Security system.

**Presentation recommendation 1: Graphics.** The Panel recommends turning many of the Trustees Report's tables into graphs. For each assumption, historical data could be shown graphically alongside projected data.

**Presentation recommendation 2: Core messages.** The Panel recommends the Trustees focus the graphs further on the report's core messages.

**Presentation recommendation 3: Plain language.** The Panel recommends the Trustees follow the Federal plain language guidelines where possible.

**Presentation recommendation 4: Presentation of depletion date.** The Panel recommends refining the presentation of the trust fund reserve depletion date by providing further context, showing a simpler graph, and renaming the depletion date.

**Presentation recommendation 5: Communications strategy.** The Panel recommends enhancing the online and media communications strategy by improving the website user interface, creating a Frequently Asked Questions (FAQ) page, improving public outreach on social media, and improving OCACT's webpage on the Trustees Report. The Social Security Administration (SSA) should provide OCACT with a budget to hire communications and user experience professionals to help implement this.

**Presentation recommendation 6: Communicating results.** The Panel recommends clarifying and refining the meaning of the Trustees Report's findings by replacing the current high- and low-cost scenarios with confidence intervals, clarifying the objective of the intermediate-cost projection, and clearly indicating when the Trustees Report does and does not assume current law.

**Presentation recommendation 7: Implicit assumptions.** The Panel recommends expanding the Trustees Report's sensitivity analysis to encompass key implicit assumptions.

**Presentation recommendation 8: External accessibility.** The Panel recommends providing and supporting greater external access to the projection models used to produce the Trustees Report.

**Presentation recommendation 9: Past projections.** The Panel recommends OCACT regularly make available comparisons of the past projections of the assumptions to their past realizations.

## **Demographic assumptions and methods**

The demographic assumptions determine the projected size and age structure of the population into the future. The cost of the Social Security system depends largely on the ratio of the expected number of workers paying into the system and the expected number of people receiving benefits. Birth rates (fertility) are the primary determinant of the relative size of the working age and beneficiary cohorts and falling birth rates after the Baby Boom are the primary driver of our aging society. Death rates (mortality) are a secondary contributor to population aging and also determine how long people are expected to work and to receive benefits. New entrants to the population through immigration affect the size of the population and labor force, future levels of fertility, and the share of the population eligible to receive benefits. As the Panel spoke with experts on these topics and provided their own insights, it became clear that there is a significant amount of uncertainty around each of these assumptions, as reflected in the following recommendations. While the Panel presents specific recommendations, the reader is encouraged to review the report to understand the various points of view that were considered in arriving at these recommendations.

### **Fertility**

The period Total Fertility Rate (TFR) has been declining in the United States for more than a decade, most recently hitting a low of 1.73 in 2018. While many experts thought this was a consequence of the Great Recession, a low TFR has persisted through to the relatively robust economic conditions at present. Like many other assumptions noted in this report, the Panel feels we are in a period of heightened uncertainty as to what the long-term outlook for fertility may be. We recommend that OCACT continue to closely monitor all aspects of fertility: age at first birth, period fertility rates, and completed cohort fertility rates by age, race, income/education and native vs. immigrant status.

**Fertility recommendation 1: Fertility rate.** The Panel recommends slightly lowering the ultimate period TFR to 1.95.

**Fertility recommendation 2: Cohort fertility rates.** The Panel recommends allowing for a continuation of the long-term shift to older ages of motherhood, with long-term fertility being driven by assumptions about cohort fertility rates.

**Fertility recommendation 3: Immigration and fertility.** The Panel recommends OCACT develop the capability to model native and immigrant fertility separately.

## **Mortality**

Over the long-term there has been a steady increase in human life expectancy in the United States and all other industrialized countries. The fact that age-specific rates of mortality have declined at a more-or-less steady pace over long periods of time has led this and past Panels to encourage the Trustees to use this trend as the basis for making long-term projections.

Recently, however, the United States, has seen a striking reversal of progress in life expectancy, with the last 3 years all showing life expectancy at birth falling. Despite ongoing medical improvements in many areas, social issues including drug overdoses, obesity and suicide along with several severe flu seasons have resulted in mortality increasing rather than decreasing at many ages in recent years. While flu-related variations in death rates are normal, the societal issues present a trend that is difficult to project. While the Panel recommends continuing to assume that US mortality will improve over the long term, we also recommend that the Trustees and OCACT monitor emerging data and research, consider projecting little or no improvement for the very short term, and explicitly highlight in the TR the heightened uncertainty in predicting mortality at this point in time.

**Mortality Recommendation 1: Mortality improvement.** The Panel recommends: increasing the ultimate aggregate rate of mortality improvement to align with long-term historical experience, while reflecting recent poor experience in the short term; incorporating greater uncertainty in the projection of future mortality; and continuing to vary the ultimate rate of improvement by age group.

**Mortality Recommendation 2: Cause of death.** The Panel recommends OCACT project mortality in aggregate over the long-term rather than by cause of death, while acknowledging that cause of death analysis has significant value over the intermediate term.

**Mortality Recommendation 3: Heterogeneity.** The Panel recommends OCACT develop the capability to model mortality and other demographic assumptions by either educational attainment, income or both.

**Mortality Recommendation 4: Transparency.** The Panel recommends OCACT look for ways to improve transparency, understanding and reproducibility.

**Mortality Recommendation 5: Data compatibility.** The Panel recommends continuing to investigate differences between the starting mortality rates produced by SSA and the Human Mortality Database (HMD) and take appropriate action.

## **Immigration**

OCACT projections make a distinction between two types of foreign-born non-citizens: lawful permanent residents (LPRs) and other than LPRs. The latter category includes unauthorized immigrants, temporary workers, and students. The OCACT projects annual immigration flows for LPRs and other-

than-LPRs. It also projects legal emigration flows (including LPRs and citizens) and other-than-LPR emigration flows. Finally, it projects the annual number of individuals with other-than-LPR status who become LPRs. The total flow in each category is broken down by age and sex.

OACT applies current law caps to project the annual inflow of those categories of LPRs that are capped by law. There are certain categories that are not capped, primarily immediate relatives of citizens. Annual legal emigration is assumed to be 25 percent of the level of LPR immigration. Annual other-than-LPR immigration is assumed to be 1,350,000. Transfers from other-than-LPR to LPR status are assumed to equal one-third of the other-than-LPR inflow. All flows except other-than-LPR emigrants are held constant. Other-than-LPR emigration is assumed to be proportional to the size of the other-than-LPR population, which is projected to increase. Thus, net annual immigration is projected to decline from about 1.4 million in 2020 to 1.2 million in 2095.

LPR immigrants' labor force behavior and earnings are assumed to be the same as that of the native born. The assumptions for other-than-LPR immigrants vary by category.

**Immigration Recommendation 1: Population basis.** The Panel believes the Trustees' assumptions are reasonable for the near term (five to ten years). Beyond the next five to ten years, the Panel recommends tying assumed levels of LPR immigration and other-than-LPR immigration to the size of the population, with the three scenarios reflecting the range of plausible outcomes for immigration projected as a fraction of the population.

**Immigration Recommendation 2: Heterogeneity.** The Panel recommends OACT develop the capability to reflect more heterogeneity among immigrants in the projection model to capture the changing characteristics of immigrants.

## **Economic assumptions and methods**

The economic assumptions are key determinants of the Social Security program's cost and income. The labor force participation rate and the unemployment rate assumptions determine the size of the working population contributing revenue and earning eligibility for benefits. Real wage assumptions determine how the earnings generated by the working population are expected to grow over time. Wage growth increases payroll tax revenue and leads to future increases in benefit levels. The taxable share assumption describes the percentage of earnings covered by Social Security that fall below the Social Security payroll tax threshold. Inflation rates determine how much the Cost of Living Adjustment (COLA) will increase existing benefits and affects the size in nominal dollars of Gross Domestic Product (GDP), earnings and taxable payroll. Interest rates determine expected revenue from trust fund reserves (held as special issue US Treasury bonds) and are the discount factor used to calculate financial measures summarized over a period of years. While the Panel presents specific recommendations, the reader is encouraged to review the report to understand the various points of view that were considered in arriving at these recommendations.

### **Labor Force Participation**

The projections of labor force participation affect both the revenues and the costs of the Social Security system. Higher rates of labor force participation mean a larger Social Security tax base, which boosts revenues and eventually boosts benefits as well.

**Economics Recommendation 1.1: Labor force participation.** The Panel agrees with the 2017 Technical Panel on Labor Force Participation that the OCACT model should assume that the forces underlying the long-term trends in labor force participation abate slowly over the medium term. In particular, we recommend that the historical trend of 0.14 percentage point per year decline in age-adjusted prime-age male labor force participation abate gradually over 25 years.

**Economics Recommendation 1.2: Labor force participation.** The Panel recommends that the historical trend of 0.5 percentage point per year decline in the labor force participation of men and women ages 16–19 and the 0.35 percentage point per year decline in labor force participation of men ages 20–24 abate gradually over 25 years.

**Economics Recommendation 1.3: Labor force participation.** The Panel recommends that the Trustees maintain their assumption of increasing labor force participation of older workers.

**Economics Recommendation 1.4: Labor force participation.** The Panel recommends that the Trustees assume that the cyclical recovery in labor force participation following the Great Recession has ended and use current labor force participation rates as the jumping off point for the trends discussed in recommendations 1.1 and 1.2.

**Economics Recommendation 1.5: Labor force participation.** The Panel recommends that the low-cost scenario assume that labor force participation rises gradually over 25 years, so that participation in 25 years for each age group is equal to participation 25 years prior and then remain at that level for the remainder of the projection. For the high-cost scenario, we recommend allowing the declines suggested above to abate slowly over the entire 75 years of the projection, instead of 25 years.

**Economics Recommendation 1.6: Labor force participation.** The Panel further recommends that labor force participation be better linked to changes in wages. Under current assumptions, a given percentage increase in the labor force raises payroll one-for-one, without accounting for the likely wages (and hours) of those whose participation is changing, whereas most of these changes likely are for low-education workers and teenagers.

**Economics Recommendation 2: Unemployment.** The Panel recommends lowering the assumed ultimate unemployment rate in the intermediate scenario from 5.5 percent to 4.8 percent and to 3.8 percent and 5.8 percent in the low-cost and high-cost scenarios, respectively.

## Real Wage Growth

The rate of real earnings growth is one of the most important assumptions in the Social Security projections. While higher earnings growth eventually leads to higher benefit growth for current and future workers, it has no effect on the benefits of the currently retired. Thus, the higher the rate of real earnings growth, the smaller the actuarial imbalance in the system.

The Trustees break down the real earnings into five components: (1) economy-wide productivity growth; (2) the labor share of output; (3) Social Security earnings as a share of total compensation; (4) average hours per worker; and (5) the ratio of the GDP price deflator to the Consumer Price Index (CPI).

$$Real\ earnings\ per\ worker = \frac{(1)\ \frac{Nominal\ GDP}{GDP\ Deflator}}{Hours} \times \frac{(2)\ Compensation}{GDP} \times \frac{(3)\ Earnings}{Compensation} \times \frac{(4)\ Hours}{Employment} \times \frac{(5)\ GDP\ deflator}{CPI}$$

**Economics Recommendation 3: Real wage growth.** For the intermediate projection, the Panel recommends the Trustees assume that average real earnings per worker increase 1.08 percent per year from 2028 to 2063, down from the 1.18 percent assumed in the 2019 Trustees Report. For the low-cost and high-cost scenarios, we recommend an average increase of 1.71 percent and 0.45 percent, respectively, per year (down from 1.77 and 0.6 in the 2019 Trustees Report).

**Economics Recommendation 3.1.1: Real wage growth: productivity growth.** The Panel recommends that the Trustees lower their long-run assumption for non-farm business productivity growth to 1.9 percent and for economy-wide productivity growth to 1.55 percent.

**Economics Recommendation 3.1.2: Real wage growth: productivity growth.** The Panel recommends maintaining a 0.3 percentage point difference for the high- and low-cost scenarios, so that non-farm business productivity growth is 1.5 percent in the high-cost scenario and 2.1 percent in the low-cost scenario and economy-wide productivity growth is 1.25 percent in the high-cost scenario and 1.85 percent in the low-cost scenario.

**Economics Recommendation 3.2.1: Real wage growth: labor share.** The Panel recommends that the Trustees assume that the labor share of GDP be 61.5 from 2028 on. This means lowering the growth in the compensation share of GDP over the first ten years of the projection (2019 to 2028) from an average of 0.384 percent per year as in the 2019 Trustees Report to 0.114 percent per year.

**Economics Recommendation 3.2.2: Real wage growth: labor share.** The Panel recommends retaining the Trustees' assumption of no change in the ratio of compensation to GDP after 2028 in the intermediate scenario.

**Economics Recommendation 3.2.3: Real wage growth: labor share.** The Panel recommends incorporating uncertainty in the trajectory of the labor share, with the low- and high-cost scenario having a labor share that trends 0.05 percentage points per year up and down, respectively, over the intermediate 25-year horizon, before stabilizing. Under these scenarios, the labor share at the end of 25 years would be 60.3 percent of GDP under the high-cost scenario and 62.8 of GDP under the low-cost scenario.

**Economics Recommendation 3.2.4: Real wage growth: labor share.** The Panel recommends that OCACT analyze net labor shares by economic sector: non-housing non-farm private, housing, government and non-profit institutions.

**Economics recommendation 3.3.1: Real wage growth: earnings to compensation.** The Panel recommends that the Trustees use an average of 0.07 percentage point increase in the health spending share of compensation as a pre-excite tax value for 2028–2093, which is the result of assuming an excess cost growth rate of 1 percent gradually declining to 0.5 percent over 75 years. This assumption translates into a decline in the earnings share of compensation of 0.07 percentage point per year from 2028–2093.

**Economics recommendation 3.3.2: Real wage growth: earnings to compensation.** The Panel recommends that the Trustees maintain the range of plus or minus 0.1 percentage point for the average change in high-cost and low-cost scenarios, so that earnings to compensation would decline 0.17 percentage point per year in the high-cost scenario and increase 0.03 percentage points per year in the low-cost scenario.

**Economics recommendation 3.4.1: Real wage growth: hours worked.** The Panel thinks that the assumption of continuing declines in average hours worked of 0.05 percent per year is reasonable. We

also think the changes in hours under the high- and low-cost scenarios of -0.15 percent per year and 0.05 percent per year, respectively, are reasonable.

**Economics recommendation 3.4.2: Real wage growth: hours worked.** Given the changes in labor force participation the Panel is recommending, the Panel recommends OCACT investigate more fully the impact of changing the sex/age mix of the workforce hours. As noted in the methodology section, a microsimulation model would account for these changes automatically, but, short of that, OCACT should perform some analysis to see if these effects are likely to be important.

**Economics recommendation 3.5: Real wage growth: PGDP-CPI price differential.** The Panel recommends no changes to the Trustees' assumptions about the wedge between the GDP deflator and the CPI.

### Real interest rates

**Economics recommendation 4.1: Real interest rate.** The Panel recommends allowing real interest rates to rise gradually over the medium term (25 years) to 2.3 percent, a level closer to, but still below, the average since 1962. That would mean that the real interest rate would average about 1.2 percent over the next 25 years.

**Economics recommendation 4.2: Real interest rate.** The Panel recommends that real interest rates rise gradually over 25 years in both the low-cost and high-cost scenarios, reaching 1.5 percent in the high-cost scenario and 3 percent in the low-cost scenario. Under the 2019 Trustees' projections, these values were 2 percent and 3 percent, respectively. We believe that the magnitude of uncertainty is larger than encompassed by the current range of ultimate values.

### Inflation

**Economics recommendation 5.1: CPI.** The Panel recommends lowering the assumed rate of CPI-W inflation from 2.6 percent to 2.4 percent.

**Economics recommendation 5.2: CPI.** The Panel recommends maintaining a 0.6 percentage point difference between the intermediate and low- and high-cost scenarios, so that the CPI-W is 1.8 percent in the high-cost scenario and 3.0 percent in the low-cost scenario.

### Taxable share of covered earnings

**Economics recommendation 6.1: Taxable share.** The Panel recommends that OCACT assume that the taxable share of covered earnings will continue to decline over the medium term. The Panel recommends allowing a 0.15 percentage point decline to abate slowly over 25 years. That would bring the taxable share down to about 80.8 percent by 2043.

**Economics recommendation 6.2: Taxable share.** The Panel recommends using a similar 25-year trend for the low- and high-cost scenarios, beginning at -0.4 percentage point per year for the high-cost scenario (the time trend from 1982 through 2012) and +0.1 percentage point per year for the low-cost scenario to be symmetric, and allowing these trends to abate over 25 years. Over the 2028–2093 period, this recommendation would lower the growth rate of taxable earnings by 0.04 percentage point per year for the high-cost scenario and increase it by 0.01 percentage point per year in the low-cost scenario.

## Program-specific assumptions and methods

The Trustees' projections of the cost of the OASI portion of the program are based on the number of retired worker and dependent beneficiaries, as well as average benefit levels. Beneficiaries are projected by age, sex, and marital status. In each cohort, the number of individuals receiving retired worker benefits at age 62 is tied to labor force participation and the time to full retirement age.

### Benefit model

**Benefit model recommendation 1: Model comparison.** In Methods Recommendation 2, the Panel recommends that OCACT develop and maintain a core microsimulation model as part of an expanded projection toolkit. The Panel specifically recommends comparing benefit projections based on the current methodology against results from alternate models such as a microsimulation model. Any significant differences should be analyzed and appropriate action taken.

**Benefit model recommendation 2: Benefit claiming patterns.** In Presentation Recommendation 7, the Panel recommends expanding the Trustees Report's sensitivity analysis to key implicit assumptions. With respect to specific assumptions needed to project benefits, the Panel recommends that SSA conduct studies on the sensitivity of key financial outcomes (cost and income rates and the trust fund reserve depletion date) to benefit claiming age patterns.

### Disability

The disability incidence rate was highlighted in the most recent Trustees Report due to a significant downward shift over the past ten years. Even when adjusted for declining unemployment rates, this shift has not been totally explainable. Discussions with experts in the insurance industry confirm their observation of a downward shift in disability insurance incidence rates that is being analyzed.

**Disability Recommendation 1: Incidence rates.** The Panel recommends lowering the ultimate age-sex adjusted disability incidence rate to 4.9, consistent with the Panel's preferred assumption of 4.8 for the long-run unemployment rate and taking into account some of the recent observed downward shift in disability incidence. Because the incidence rate appears to have undergone rapid changes over the last decade, with some recent signs of reversal among the youngest age groups, the Panel recommends that SSA closely monitor trends in incidence rates as they evolve over time and explicitly linking the disability incidence and unemployment rate assumptions in its projections.

**Disability Recommendation 2: External consultation.** With respect to making judgments about the future evolution of disability incidence rates, in addition to closely monitoring trends in Social Security Disability Insurance (SSDI) incidence rates, the Panel recommends that the SSA maintain regular contact with experts in the disability insurance industry to benefit from these experts' insights into disability incidence rates experienced in the private market.