Projections Report

FY 2023

PBGC
Pension Benefit
Guaranty Corporation

TABLE OF CONTENTS

FIGURES

FREQUENTLY USED ABBREVIATIONS

ARP	American Rescue Plan Act of 2021
ERISA	Employee Retirement Income Security Act of 1974, as amended
FY	Fiscal Year
ME	Multiemployer
MP-2021	Mortality Projection − 2021 Mortality Improvement Scale
MPRA	Multiemployer Pension Reform Act of 2014
PBGC	Pension Benefit Guaranty Corporation
PIMS	Pension Insurance Modeling System
SE	Single-Employer
SFA	Special Financial Assistance
VBL	Vested Benefit Liability
VRP	Variable Rate Premium

EXECUTIVE SUMMARY

The Pension Benefit Guaranty Corporation (PBGC or Corporation) insures against the loss of participants' pension benefits in private-sector pension plans. PBGC operates two separate insurance programs — one for multiemployer defined benefit pension plans and one for single-employer defined benefit pension plans — that are legally separate and operationally and financially independent. The two programs provide different benefit guarantees and utilize different funding mechanisms. This report primarily includes 10-year projections, ending with FY 2033 (September 30, 2033), of the financial status of both programs under a range of future financial scenarios, plus additional projections beyond 10 years for the Multiemployer Program.

PBGC's Multiemployer Program is likely to remain solvent for more than 40 years, similar to the projection in last year's Projections Report. More specifically, the stochastic projections show the Multiemployer Program remaining solvent more than 40 years out in 61 percent of projected scenarios, compared to 60 percent in last year's report. However, both reports show a high degree of uncertainty, with the worst downside scenarios continuing to show a risk of insolvency in the late-2030s. The projections in this year's report improved primarily due to an increase in the projected plan funding levels, as a result of better-than-expected investment performance. The projected FY 2033 net financial position of the Multiemployer Program is positive in 69 percent of model scenarios, with a median value of positive $4.4 billion, but the mean net position is negative $4.7 billion.

PBGC's Single-Employer Program is projected to remain in a positive net financial position over the next decade in all the modeled scenarios. The projected outcomes are improved from last year's report, in large part attributable to the better-than-expected growth in the net position during FY 2023 as reported in PBGC's FY 2023 Annual Report. Similar to last year's results, projected claims are expected to be significantly lower than projected premium income.

Figure 1 summarizes the main results of this report.

Figure 1 – PBGC Projected Mean Net Financial Position at the End of FY 2033 Present Value at the end of FY 2023 ($ billions)		
	Multiemployer Program	**Single-Employer Program**
Mean	($4.7)[a]	$71.6[b]
Median	$4.4	$70.6
15th to 85th Percentile	($15.5) - $5.5	$60.9 - $82.5

a) ($4.7) billion projected mean net financial position consists of $8.9 billion in assets and $13.6 billion in liabilities. While the mean of all scenarios shows a negative net position for FY 2033, 69 percent of scenarios project a positive net position for FY 2033.
b) $71.6 billion projected mean net financial position consists of $124.9 billion in assets and $53.3 billion in liabilities.

PBGC's insurance programs protect participant pension benefits up to the level of PBGC's guarantees, which are defined by law. However, plan-level benefits may exceed PBGC's guarantee, causing participants to lose a portion of their accrued benefits. It is important to note that even under scenarios where both programs

remain solvent indefinitely, many participants may face benefit reductions due to PBGC's guaranteed benefit level upon termination of an underfunded single-employer plan or the insolvency of a multiemployer plan.

MULTIEMPLOYER PROGRAM

American Rescue Plan Act of 2021 (ARP)

The Special Financial Assistance (SFA) Program enacted on March 11, 2021, as part of the American Rescue Plan Act of 2021 (ARP), provides funding to eligible severely underfunded multiemployer pension plans and enables the plans to pay benefits, without reduction, for many years into the future. The SFA Program is funded by an appropriation of Treasury general revenues. Prior to the enactment of ARP, PBGC's Multiemployer Program was expected to become insolvent by 2026. With the SFA Program, PBGC's Multiemployer Program will likely remain solvent for at least 40 years.

The SFA Program enables eligible multiemployer plans to apply to PBGC for SFA. Eligibility is limited to financially troubled plans based on specific criteria set by statute. An eligible plan's SFA is the amount required for the plan to pay benefits due through plan year 2051, calculated by the plan using specified assumptions generally defined by statute and PBGC regulations. Upon approval of an eligible plan's application, PBGC pays SFA to the plan as a single payment. Unlike traditional financial assistance paid to insolvent plans, SFA payments are not subject to repayment to PBGC. As of December 31, 2023, the cutoff date for this report, PBGC has approved 104 applications totaling $53.6 billion in SFA distributed to 69 plans covering nearly 775,000 participants.[1] Additionally, as of December 31, 2023, there were 18 applications under review by PBGC, requesting approximately $8.2 billion in SFA.

PBGC's mean estimate of total SFA projected to be paid under ARP is $79.6 billion to be distributed to 198 plans.[2] This is a $0.1 billion decrease from the $79.7 billion in total SFA projected in last year's report. PBGC's modeling of SFA now shows only a small range of projected amounts because the modeling utilizes the information provided in SFA applications submitted to PBGC. The majority of eligible plans have submitted applications (whether approved or not) or have set their SFA measurement date (via a lock-in application), which reduces uncertainty. However, PBGC's modeling of SFA does not measure uncertainty in plan data and assumptions in future applications. Therefore, the actual SFA total could deviate from the $79.6 billion estimate, but this deviation is not expected to be significant.

Projected Net Financial Position (Assets vs. Liabilities)

The Multiemployer Program projections, displayed as present values as of September 30, 2023, show a decline in the mean net financial position (i.e., the average of all the scenarios modeled) of $6.2 billion – from positive $1.5 billion (the actual reported and audited net position on September 30, 2023) to a projected negative $4.7 billion on September 30, 2033.

---

[1] Of the 104 total approved applications, 35 were supplemented applications that provided additional SFA totaling $1.8 billion to plans approved under the terms of PBGC's Interim Final Rule based on the updated provisions of the Final Rule.

[2] Under ARP, plans have until December 31, 2025, to file an initial application and until December 31, 2026, to file a revised application. Plan eligibility is determined based on statutory criteria for plan status at enactment and during plan years 2020 through 2022.

PBGC's Multiemployer Program generally provides traditional financial assistance only after a plan becomes insolvent, but plans are booked as future claims when they are projected to become insolvent within the next 10 years (see *Financial Obligations* below). Accordingly, the projected net position as of September 30, 2033, includes claims for plans expected to become insolvent by September 30, 2043. The SFA Program is likely to protect currently ongoing, solvent plans from becoming insolvent prior to September 30, 2033, so the liability for future claims reported in the net position as of September 30, 2023, is small. However, in unfavorable scenarios, some plans (both SFA and non-SFA plans) are projected to become insolvent prior to September 30, 2043, which introduces claims and decreases the projected net position as of September 30, 2033.

Projected Solvency (Ability to Pay Full Guaranteed Benefits)

PBGC's Multiemployer Program is expected to stay solvent during the 10-year period ending September 30, 2033, because of the SFA Program. In most projection scenarios, the SFA provided to eligible plans delays the insolvency of those plans, and thus the insolvency of PBGC's Multiemployer Program, by more than 40 years in the future. The most pessimistic of the 500 stochastic scenarios projects the Multiemployer Program will become insolvent in FY 2037, while optimistic scenarios project it to remain solvent indefinitely. Sixty-one percent of scenarios result in solvency that will extend past FY 2063, the last year of the projection period. The uncertainty about whether and when the Multiemployer Program will run out of money is driven by several variables, such as plans' future asset performance, contribution income, and the actual level of future benefit payments.

Methods and Assumptions

The Multiemployer Program projections model is substantially the same as the one used last year but reflects new plan data and updated economic assumptions.[3] Additionally, the model incorporates updates to:

(1) The assumptions for plan asset allocations and returns,
(2) The assumption for contribution base unit declines for plans receiving SFA,
(3) The assumption for contribution rate increases, and
(4) The projected future rates of mortality.

Further description of these changes, along with their impact on the projection results, are found in the **Multiemployer Reconciliation of FY 2022 Projections to FY 2023 Projections** and in the **Appendix**.

SINGLE-EMPLOYER PROGRAM

Projected Net Financial Position (Assets vs. Liabilities)

The projection shows the net financial position in the Single-Employer Program growing from $44.6 billion, the actual reported net financial position as of September 30, 2023, to an estimated mean of $71.6 billion on September 30, 2033 (on a present value basis as of September 30, 2023). The Single-Employer Program's net position increased by $8.0 billion in FY 2023, to an amount that is more than the mean projection for FY

---

[3] New plan data includes data from SFA applications (including lock-in applications) and available funding (zone) status certification data for plan years 2020-2022.

2023 in the FY 2022 Projections Report, primarily due to favorable PBGC asset returns and higher than expected premium income.

As the net position of the Single-Employer Program improves, the potential for a negative net position in the future decreases, even in scenarios with very high projected claims. Still, any downturn in the economy increases both underfunding and the probability of claims to PBGC. This Projections Report includes a 10-year stochastic projection of total underfunding of PBGC-insured single-employer plans (see **Figure 20** and **Figure 21**).

This year's report also includes a stress scenario in which a significant market downturn is coupled with a level of claims that resembles the highest period of claims ever experienced in the Single-Employer Program. In this hypothetical scenario, the Single-Employer Program incurs a sharp initial decline in its projected net position due to a period of high claims, but the net position remains positive and subsequently improves over the remaining course of the 10-year projection. The Single-Employer Program is not projected to fall into deficit under the stress test and the projected net position following the period of elevated claims is higher than in last year's stress test.

Methods and Assumptions

The Single-Employer Program projections model is substantially the same as the one used last year, but reflects new plan data and updated economic assumptions. Additionally, the model incorporates:

(1) A modeling improvement made to the projection of PBGC assets in order to more accurately reflect gains and losses associated with changes in interest rates,
(2) An update to the assumption for plan contributions,
(3) A refinement to the projection of variable rate premiums, and
(4) The projected future rates of mortality.

Further description of these changes, along with their impact on the projection results, are detailed in the **Single-Employer Reconciliation of FY 2022 Projections to FY 2023 Projections** and in the **Appendix**.

ABOUT THIS REPORT

PBGC's annual Projections Report is required by section 4008 of the Employee Retirement Income Security Act, as amended (ERISA) to be an "actuarial evaluation of the expected operations and status of [PBGC's] funds." The purpose of the report is to provide an actuarial evaluation of the future financial status of PBGC's Multiemployer and Single-Employer Programs. It does so by projecting solvency (ability to make required payments) and net financial position (balance sheet assets minus liabilities) for the two programs in a variety of simulated future conditions. Projected net financial position is determined on a present value basis as of September 30, 2023. A negative net position does not imply a projected insolvency.

The results in this report were developed based on PBGC and plan data available on or before September 30, 2023, economic data as of December 31, 2023, and SFA application activity through December 31, 2023.[4]

---

[4] The use of economic data as of December 31st following the measurement date improves the model's projection of single-employer variable rate premium revenue in the following year because most plans' variable rate premium requirements are based on funding levels as of January 1st.

The projections start with PBGC's FY 2023 Annual Report and forecast results under a range of future economic scenarios.[5] The projections reflect current law and assume no future changes in the law.

SFA is funded by appropriations of general revenues through periodic transfers from the Treasury Department. This report provides estimates for the aggregate amount of SFA to be distributed by PBGC but does not show SFA outlays on an annual basis. The timing of PBGC SFA payments to eligible plans depends on the timing of plans' SFA applications and PBGC approvals.

PBGC uses two stochastic models to develop the projections in this report: the Multiemployer Pension Insurance Modeling System (ME-PIMS) and the Single-Employer Pension Insurance Modeling System (SE-PIMS). Both systems use probabilistic distributions of investment returns, interest rates, and other variables to estimate a range of possible future outcomes. The ME-PIMS model runs 500 total scenarios and the SE-PIMS model runs 5,000 total scenarios.[6] This report uses averages and ranges to summarize the results of the stochastic simulations.

The projections shown are estimates, not predictions. They reflect a reasonable range of values that result from assumptions about many factors including:

- Inflation and wage growth.

- Interest rates (e.g., 30-Year Treasury yields, corporate bond yields).

- Equity returns.

- Plan sponsor decisions about contributions.

- Multiemployer plan applications under the SFA Program.

In addition, many aspects of the individual plans and the complex rules that govern the private employment-based pension system in the United States are simplified or disregarded to create a working model. **The actual results that ultimately occur in future years will vary, potentially significantly, from the mean projections in this report.**

Wide Range of Possible Outcomes

To illustrate the uncertainty of future outcomes, this report shows a range of results associated with a given set of assumptions. These include the mean (i.e., average) and median (i.e., middle) values, as well as percentile results along the distribution of outcomes. To demonstrate potential variation, the 85th percentile (15 percent of the outcomes are higher [more favorable]), the median value (50th percentile), and the 15th percentile (15 percent of outcomes are lower [less favorable]) are shown. During a period of 10 or more years, it is likely that results will at times fall outside this 15th – 85th percentile range. The report also shows results for the 1st and 99th percentiles to provide a sense of the broad range of potential outcomes.

---

[5] The financial statements in the FY 2023 Annual Report were prepared in conformity with accounting principles generally accepted in the United States of America (U.S. GAAP) and utilize data and assumptions available as of September 30, 2023 (the end of FY 2023).

[6] Both models run 500 economic scenarios, but the SE-PIMS model additionally runs each of these 500 scenarios under 10 bankruptcy simulations.

Financial Obligations

The report presents two types of financial measures:

- Liabilities – The present value of the projected guaranteed retirement benefits provided by PBGC for the lifetime of participants and their beneficiaries. PBGC's liabilities are compared to its assets to determine a net position.

- Cash flows – The benefit payments or financial assistance payments (traditional and special) expected to be disbursed by PBGC during each year of the projection period. Cash flows provide the basis for examining PBGC solvency.[7]

Claims are newly recorded liabilities reduced by any associated plan assets and cash recoveries from plan sponsors for a plan that PBGC takes over.[8] Claims are recorded when the payment of guaranteed benefit amounts is deemed "probable."[9] Claims occur only when a plan does not have enough assets to pay benefits up to the level guaranteed by PBGC. PBGC's liabilities include amounts for claims where PBGC is already providing assistance and estimated amounts for probable claims yet to be incurred.

The insurable event giving rise to a claim and the coverage provided is different for the Single-Employer Program and the Multiemployer Program.

- *Single-Employer Program* – The insurable event is termination of an underfunded plan, generally where the sponsor is in financial distress (e.g., bankruptcy of a company that sponsors a plan without enough assets to cover all future benefits up to the level guaranteed by PBGC).[10]

- *Multiemployer Program* – The insurable event is plan insolvency, typically the drawdown of all assets in the plan, such that there is not enough money to pay full benefits for the next year. For accounting purposes, multiemployer claims are booked as probable losses when a plan is projected to be within 10 years of insolvency.

Discussions of PBGC's net position reflect a comparison of liabilities to assets as of a certain date. The PIMS models estimate liabilities and assets on PBGC's books in the future in different economic scenarios.

"Benefit payments" in the Single-Employer Program and "financial assistance" in the Multiemployer Program mean the amount PBGC is projected to pay to participants or a multiemployer plan during that year, respectively, regardless of when a plan failed. The solvency projection of each PBGC program is based on the sufficiency of assets, investment returns, and premiums to meet PBGC's benefit payment/financial assistance obligations and expenses for a particular year. This report uses the term "insolvent" to mean lacking the funds to pay benefits/assistance and expenses for a year. PBGC can have a negative net position but still not be insolvent by this definition.

---

[7] Traditional financial assistance is paid to plans that run out of money in order to pay guaranteed benefits under ERISA Section 4261. SFA is paid to eligible ongoing plans under ERISA Section 4262.

[8] Asset recoveries are made in single-employer claims events and are not applicable for the Multiemployer Program.

[9] Based on the definition under the Financial Accounting Standards Board's Accounting Standards Codification Topic 450 "Contingencies."

[10] Terminations that result in claims on the Single-Employer Program can be a "distress" termination initiated by the plan administrator when the plan sponsor and its controlled group meet certain conditions of financial distress or, alternatively, an "involuntary" termination initiated by PBGC.

About the PIMS Models

The PIMS models are unique and complex. They were designed specifically for estimating the information in this report and other related analyses. The models are regularly revised to reflect changing laws, changes in anticipated plan sponsor behavior, and changes in other actuarial assumptions.

While both ME-PIMS and SE-PIMS simulate some demographic and economic factors at least 20 years into the future, they do not model all longer-term sources of uncertainty affecting the pension system.[11]

The estimated Multiemployer Program deficits and financial assistance shown in this report assume that PBGC will provide financial assistance in accordance with the current level of guaranteed benefits. This evaluation assumes no changes in current law with respect to guaranteed benefit levels after September 30, 2023, for both multiemployer plans and single-employer plans.

---

[11] For more information on PIMS, including links to user publications and peer review papers, see the PIMS web page https://www.pbgc.gov/about/projections-report/pension-insurance-modeling-system

MULTIEMPLOYER PROGRAM

MULTIEMPLOYER PROGRAM OVERVIEW

Multiemployer pension plans are maintained pursuant to one or more collective bargaining agreements between at least one labor organization and more than one employer that are generally in the same industry or members of a trade association. PBGC's Multiemployer Program covers approximately 11.0 million participants in about 1,360 plans.

The Multiemployer Program is legally distinct from, and operates differently than, PBGC's Single-Employer Program. When a multiemployer plan becomes insolvent, which occurs when a plan has insufficient funds to pay full benefits, PBGC does not take over the administration of the plan. Rather, PBGC provides traditional financial assistance directly to the plan to cover participants' guaranteed benefits and plan administrative expenses. This financial assistance is provided as loans to plans.

By statute, the features and obligations of the Multiemployer Program and the Single-Employer Program are separate and distinct. For instance, multiemployer plans' PBGC premium rates are lower than those for single-employer plans and are based solely on participant count. The amount and structure of the PBGC benefit guarantees provided under each program also differ significantly, and the guaranteed benefit amount is generally much lower for multiemployer plans. Further, Multiemployer Program assets are separate from Single-Employer Program assets, and assets from one program cannot be used to fund obligations of the other program.

In the decade following the financial crisis of 2008, a sizable segment of multiemployer plans faced near-term insolvency due to severe underfunding. ARP, enacted in March 2021, provides significant monetary relief to the most financially distressed multiemployer plans, thereby extending the projected solvency of these plans. This improves the financial status of the Multiemployer Program.

Figure 2 shows improvement in the projected FY 2033 financial condition of the Multiemployer Program from FY 2022 to FY 2023. The updates made to the FY 2023 ME-PIMS model reflect changes in data, assumptions, and capital market expectations, which are described in greater detail below.

Figure 2 – Projected Change in Multiemployer Program Key Financial Results ($ billions)		
	FY 2022 Projections	**FY 2023 Projections**
Expected FY 2033 Mean Net Financial Position – present value at the end of FY 2023	($8.9)[a]	($4.7)
Median Projected Year of PBGC Insolvency	After 2063[b]	After 2063[b]
Mean Projected Total SFA Outlays	$79.7	$79.6[c]

a) The expected FY 2033 mean net financial position based on the FY 2022 projections calculated in the ME-PIMS model (used in the FY 2022 Projections Report), with the FY 2032 mean net financial position adjusted to reflect the passage of time. This is shown in **Figure 9** of this report.
b) The median projected year of PBGC insolvency is outside ME-PIMS model's 40-year projection period.

c) The $79.6 billion mean projected SFA includes $72.9 billion in approved or requested SFA based on application activity through December 31, 2023. The remaining $6.7 billion is estimated using the ME-PIMS model.

AMERICAN RESCUE PLAN ACT OF 2021

ARP established section 4262 of ERISA under which SFA is provided to eligible multiemployer plans.[12, 13] Eligible plans can apply to PBGC for SFA in the amount required for the plan to pay all benefits due through the end of the last plan year ending in 2051, based on a deterministic projection subject to certain prescribed assumptions and methods.[14] For plans that adopted a benefit suspension under MPRA (ERISA section 305(e)(9)), or for eligible insolvent plans that suspended benefits (under ERISA section 4245(a)), the SFA includes make-up payments of suspended benefits for participants and beneficiaries who are in pay status at the time SFA is paid, and suspended benefits must be reinstated for all participants as of the effective date of the SFA payment. For eligible insolvent plans, the SFA also includes the amount needed to repay the loan from PBGC for the traditional financial assistance paid during the period of the plan's insolvency.

Plans that receive SFA continue to be covered under PBGC's Multiemployer Program, subject to the rules and the benefit guarantee for insolvent multiemployer plans. The receipt of SFA does not impact a plan's ability to apply for traditional financial assistance payments under section 4261 of ERISA if the plan becomes insolvent in the future. By receiving SFA, these plans agree to abide by certain restrictions and conditions required by statute and PBGC's SFA regulation.

For purposes of the projections summarized in this report, the FY 2023 ME-PIMS model uses the latest SFA amounts approved or requested in SFA applications as of December 31, 2023. As of December 31, 2023, PBGC approved 104 applications totaling $53.6 billion in SFA distributed to 69 plans.[15] This amount includes $35.8 billion approved and paid to the Central States Teamsters Plan on January 12, 2023.[16] Additionally, as of December 31, 2023, there were 18 applications under review by PBGC, requesting a total of approximately $8.2 billion in SFA. **Figure 3** below provides a summary of application activity through December 31, 2023, and includes the number of plans that requested to join PBGC's SFA Waiting List in order to apply at a future date.

---

[12] ARP includes additional provisions described in sections 9701 through 9703 that provide multiemployer plans with temporary funding relief. These provisions are expected to have minimal impact on PBGC's projection results and were not modeled in ME-PIMS for purposes of this report.

[13] Eligibility for SFA is limited by law to certain financially distressed multiemployer plans; refer to ERISA section 4262(b) and section 4262.3 of the SFA regulation for more information.

[14] For plans that adopted a benefit suspension under MPRA (ERISA section 305(e)(9)), the SFA determination is subject to additional calculation procedures under section 4262.4(a)(2) of the SFA regulation.

[15] Of the 104 total approved applications, 35 were supplemented applications that provided additional SFA totaling $1.8 billion to plans approved under the terms of PBGC's Interim Final Rule based on the updated provisions of the Final Rule.

[16] On April 8, 2024, the Central States Teamsters Plan repaid the U.S. Government $127 million of this amount to correct for inaccurate participant census data. Because the repayment occurred after December 31, 2023 it was not factored into the projections.

Figure 3 – SFA Application Status as of December 31, 2023[a]				
	Approved	**Under Review**	**Withdrawn**	**SFA Waiting List**
Number of Applications	104	18	17	N/A
Number of Plans[b]	69	18	17	88
Aggregate SFA Amount[c] (approved or requested)	$53.6 billion	$8.2 billion	$11.1 billion	N/A
Aggregate Participant Count[b]	774,851	355,993	556,359	N/A

a) The most recent SFA application information can be accessed on PBGC's website: https://www.pbgc.gov/arp-sfa/sfa-applications
b) The number of plans and the aggregate participant count shown exclude supplemented applications. This explains why the number of approved plans shown is less than the number of approved applications shown.
c) The amount of SFA for approved plans shows the amount paid, including traditional financial assistance loan repayments and interest to the payment date. The amount of SFA for plans under review shows the amount requested, which excludes any applicable loan repayments and interest to the payment date.

The FY 2023 ME-PIMS model does not vary the SFA amounts stochastically for plans that have already applied.[17] The SFA amounts requested for applications under review at this time are subject to change should these applications be subsequently withdrawn or denied, but the requested amount is likely to be closer to the final approved amount than an SFA amount otherwise estimated by PBGC.

For plans that have not already applied for SFA as of December 31, 2023, ME-PIMS models plan eligibility and estimates SFA amounts in 500 stochastic scenarios.[18] The SFA projections included in this report reflect available zone status certification data for all multiemployer plans through the 2022 plan year that narrow the estimated range of plans expected to be eligible for SFA.[19] Although certain plans are already expected to be eligible for SFA based on existing plan certifications, additional plans could be identified as eligible as more information becomes available to PBGC. The estimated SFA amounts can vary by stochastic trial, but the model does not vary a plan's starting asset value or interest rates if the plan submitted a lock-in application on December 31, 2023.

PBGC now estimates the total amount of SFA to be paid out under the program to be approximately $79.6 billion. This is a decrease of $0.1 billion from the $79.7 billion estimated in last year's report. The $72.9 billion in SFA that was either approved, under review, or withdrawn as of December 31, 2023, amounts to over 91

---

[17] For plans that have already been approved and paid SFA, the amounts used in the projections do not include any estimated repayment amounts to the U.S. government to correct for inaccurate participant census data based on new death audit requirements. These repayments are expected to be small relative to the overall size of the SFA payments and have minimal impact on the projections.

[18] SFA amounts for each eligible plan are estimated stochastically with the exception of plans that have submitted an application as of December 31, 2023. For eligible plans that have submitted an application to PBGC, the amount requested in the latest application (either approved or under review) is used.

[19] The plan data in ME-PIMS for this report is primarily based on 2021 Form 5500 filings, but includes zone status certification data from 2020-2023. Eligibility for SFA is projected for each individual plan through 2022 based on the zone status data as well as model assumptions pertaining to funded status and demographic changes.

percent of the $79.6 billion in projected mean SFA, which leaves a much smaller amount of SFA that is subject to any stochastic variation in the model.[20]

Estimated future SFA amounts generated by the ME-PIMS model are subject to stochastic variability only with respect to potential economic outcomes. The model does not attempt to quantitatively capture any unexpected differences in plan data and assumptions used in future plan applications for SFA. Therefore, the aggregate SFA amount remains uncertain and could reasonably differ from the $79.6 billion estimate, primarily due to the following:

- ME-PIMS generally relies on publicly available plan-level information that is typically 2-3 years old as of the date of the report and does not include sufficiently detailed information about demographic data, expected plan benefit payments, and expected contribution income for direct use in the model.

- Plan sponsors and actuaries can change certain assumptions (other than the interest rate) for purposes of determining SFA if any previous assumptions are no longer reasonable.

- Plan experience through the SFA application date will impact the amount of SFA that is requested.

- Some plans may need to submit a revised application with an updated SFA amount.

- Eligibility for SFA must be demonstrated by each plan, so the total group of eligible plans is not known with certainty.

MULTIEMPLOYER PROGRAM SOLVENCY

ARP will delay and may potentially avert the insolvency of PBGC's Multiemployer Program. Similar to last year's report, the current ME-PIMS model projects that the Multiemployer Program will remain solvent at least through 2063, the end of the ME-PIMS 40-year projection period, in more than half of the scenarios. However, if plan experience is unfavorable relative to the assumptions used, plans may become insolvent earlier than expected and, in turn, accelerate the insolvency of the Multiemployer Program. While the focus of this report is a 10-year projection, a 40-year PBGC solvency analysis is included to show the range of potential longer-term solvency scenarios.

An illustration of PBGC's multiemployer fund balance provides insight into the factors that influence the Multiemployer Program solvency projection. **Figure 4** compares PBGC's Multiemployer Program assets as of the end of each fiscal year to the projected premium income and projected average traditional financial assistance payments for each fiscal year.[21] The mean projected annual income from premiums and investment returns exceeds the mean projected annual traditional financial assistance payments each year until FY 2046, at which time the mean value of PBGC's projected multiemployer fund balance begins to decrease as plans begin to go insolvent and start drawing traditional financial assistance from PBGC's Multiemployer Program. About 10 to 30 percent of the projected traditional financial assistance is expected to be provided to plans

---

[20] The $72.9 billion includes estimated interest to the assumed payment date as well as traditional financial assistance loan repayments.

[21] Assets are shown as of a point in time – the end of the fiscal year – and compared with the cash flow generated due to premiums and financial assistance for that following year. Items of lesser significance, including investment income and administrative expenses, are not shown. PBGC's actual and projected outlays for SFA are reflected in the projected timing of individual plan insolvencies but are not illustrated in **Figure 4**, which shows a projection of assets and cash flows of PBGC's traditional insurance program for multiemployer plans.

that previously received SFA. The mean projected asset balance is shown in green and the bars illustrating the mean annual traditional financial assistance payments include both favorable scenarios in which plans remain solvent and unfavorable scenarios in which plans begin receiving financial assistance earlier than expected.

As illustrated in **Figure 4**, there is a wide range in the estimates of solvency of the Multiemployer Program, but there is an overall improvement from last year's projections. In last year's projections, the mean asset value drops to zero in FY 2058, whereas in this year's projections the mean asset value is approximately $6 billion at FY 2063, the end of the 40-year projection period. Similar to last year's report, this year's median projection also shows the Multiemployer Program remaining solvent beyond FY 2063. The higher traditional financial assistance payments in the worst scenarios have a larger influence on the mean result because they are large enough to more severely deplete the modest level of PBGC reserve assets, even when averaged with the smaller traditional financial assistance payments from the favorable scenarios. In the median projection, the acceleration of PBGC traditional financial assistance payments begins at a later point than in the mean results.

The primary driver of the improvement in the projected solvency of the Multiemployer Program is the significant improvement in projected plan funding levels due to higher plan asset values. The initial value of plan assets reported in the 2021 Form 5500 plan filings were higher than last year's ME-PIMS model had projected them to be in 2021. Also, market returns for 2023 exceeded the average of projected rates of return for 2023 in last year's model. This favorable asset experience is partially offset by lower assumed asset returns projected in future years. However, the net impact of the data and assumptions pertaining to plan assets is a significant improvement in future plan funded levels that forestalls insolvencies and claims to PBGC's Multiemployer Program.

Similar to last year's report, the projected outcomes for plans that receive SFA are generally favorable. The sharp rise in interest rates over the past two years is expected to generate higher future fixed income and equity returns that would bolster future asset performance for all plans. For SFA plans, these higher returns exceed the level of the interest rate increase used in the development of the SFA amount, which often extends plan solvency beyond 2051.[22]

---

[22] The higher interest rates have a greater impact on projected future asset returns used in the plan's solvency projection after the receipt of SFA than on the interest rates used in the SFA calculation, which are averaged over 24 months. The majority of plans that are expected to apply for SFA in the future already submitted a lock-in SFA application to PBGC, which results in use of interest rates effective in early 2023.

Figure 4 – PBGC Multiemployer Fund Assets, Traditional Financial Assistance Payments, and Premiums by Fiscal Year

(Results in Nominal Dollars)
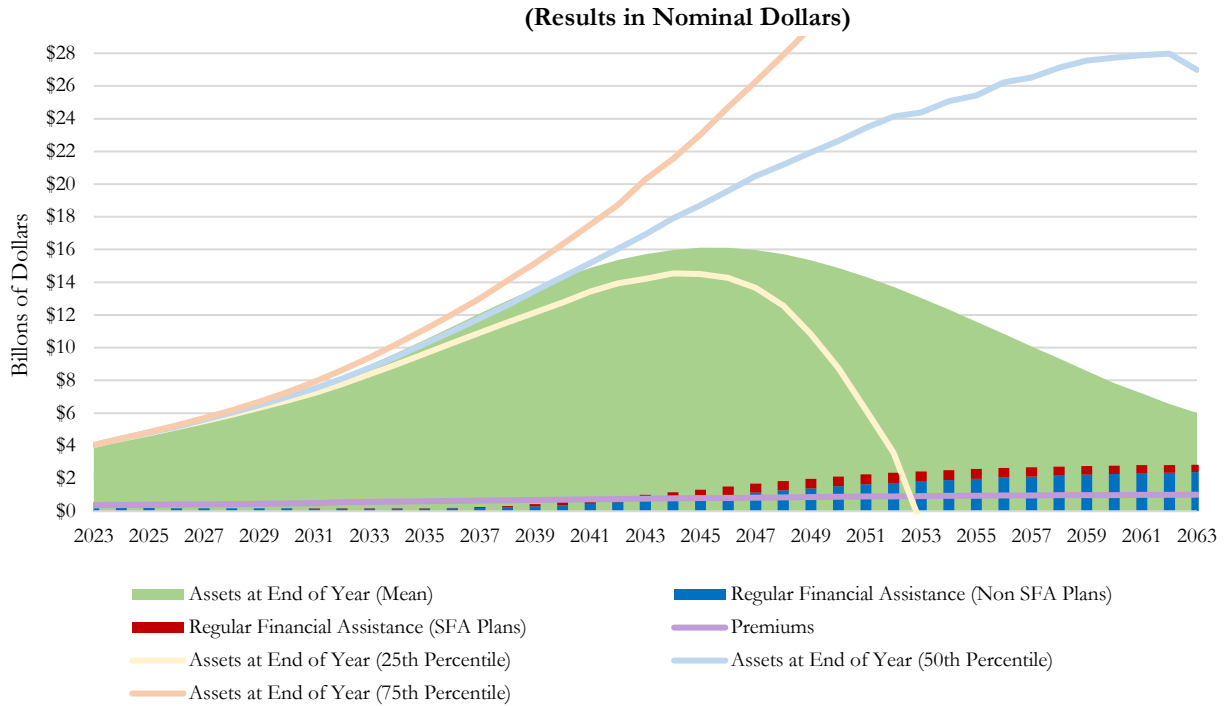
Figure 4 shows PBGC's multiemployer fund balance at three levels of certainty. In the 25th percentile results, PBGC's multiemployer fund balance is projected to be depleted in FY 2054. In the 50th and 75th percentile results, PBGC's multiemployer fund balance is projected to remain solvent beyond FY 2063. **Figure 4** also shows that projected traditional financial assistance is slightly lower than in last year's report, which is the result of higher plan-funded levels. Similar to last year's report, the majority of projected traditional financial assistance payments are expected to be provided to plans that do not receive SFA. As mentioned above, plans that receive SFA benefited from the recent increases in interest rates because SFA is generally calculated at lower interest rates than plans can currently earn on fixed income investments.

The projected solvency of the Multiemployer Program over this extended period is highly uncertain. The median projected solvency period for the Multiemployer Program is more than 40 years and a wide range of outcomes can materialize over that long period of time. **Figure 5** illustrates the wide distribution and variability of these outcomes.[23]

---

[23] PBGC assets shown in Figure 4 and Figure 5 exclude the SFA Program funds, given their pass-through structure.

Figure 5 – Projected Assets of PBGC Multiemployer Program
(Mean and percentile scenarios)

PBGC Multiemployer Program assets as of the end of each fiscal year
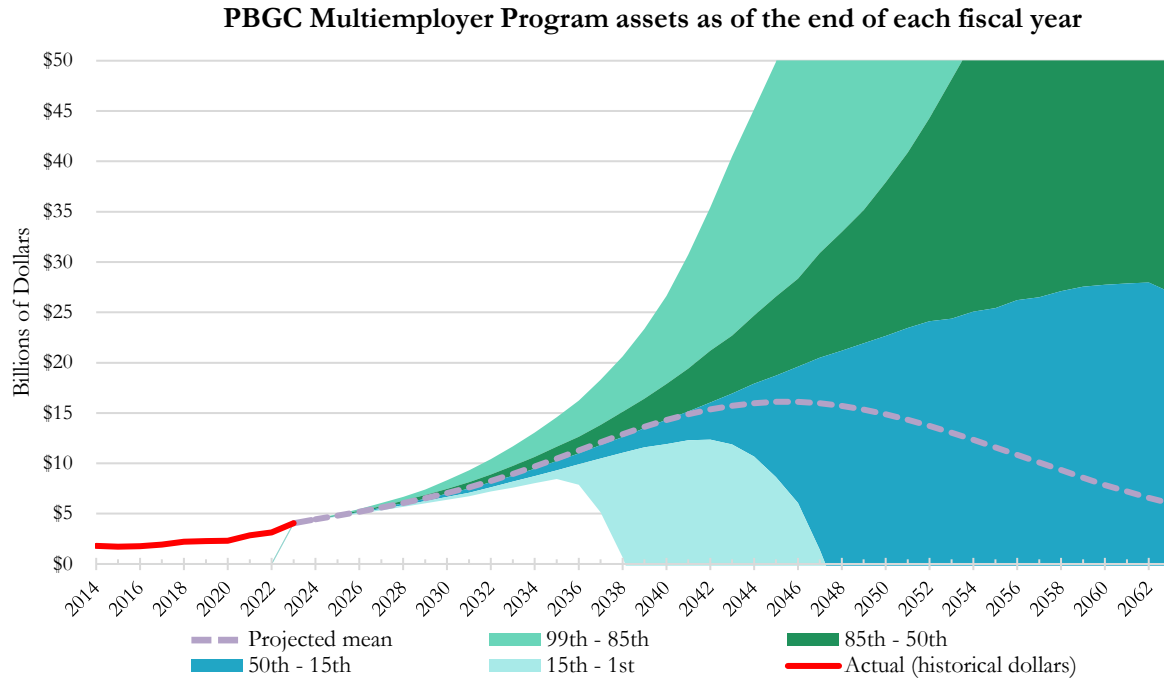
At the 1st percentile, Multiemployer Program assets are depleted during FY 2039, which is two years later than in last year's report.[24] In these scenarios, there are unfavorable investment returns in the years closely following SFA payments. In these scenarios, asset returns underperform compared to the deterministic projections included in the SFA applications, resulting in plan insolvency before 2051. The worst-case scenarios in this report are similar to last year's report.

In most scenarios, the Multiemployer Program remains solvent beyond FY 2063. In these scenarios, financial markets have generally favorable investment returns in the decade following SFA payments when asset balances are high, allowing these plans to remain solvent past 2051. These scenarios have low levels of claims that are exceeded by PBGC premium revenues, which are indexed to wage growth.[25]

Note that a large number of plans are expected to submit SFA applications using an SFA measurement date of December 31, 2022.[26] While assets for these plans incurred large investment losses in 2022, these losses are recovered in the SFA calculations. Furthermore, SFA is not reduced for the strong plan asset performance in 2023 because these gains were incurred after the SFA measurement date.

Although investment returns play a significant role in driving the wide range of stochastic outcomes, additional factors contribute to the uncertainty of the Multiemployer Program's solvency. One such factor is the level of future employer contributions to ongoing plans, which is driven by both increases to contribution

---

[24] In the worst scenario out of 500 scenarios, PBGC is projected to run out of money during FY 2037.

[25] ME-PIMS does not assume that plans implement any benefit increases for past service.

[26] Of the 111 lock-in applications submitted to PBGC as of December 31, 2023, 103 were submitted in March 2023 and "locked in" a December 31, 2022 SFA measurement date.

rates and changes in the units of work that are the basis of contributions (e.g., hours or shifts of work performed). Changes to plan demographics, future benefit accruals, and liability gains/losses also play an important role.

MULTIEMPLOYER PROJECTIONS OF NET FINANCIAL POSITION

The new projections show an improvement in the Multiemployer Program's 10-year mean projected net financial position, from negative $7.1 billion at the end of FY 2032 in last year's report to negative $4.7 billion at the end of FY 2033 in this year's report.

Last year's report projected that the mean net position would gradually decline from positive $1.1 billion as of September 30, 2022, to an estimated negative $7.1 billion at the end of FY 2032. The Multiemployer Program's actual FY 2023 net position improved to positive $1.5 billion as of September 30, 2023. This year's projection shows a gradual decline in the mean net position over the next 10 years, to negative $4.7 billion.

Figure 6 shows the actual net position for the Multiemployer Program for FY 2014 through FY 2023, and selected ranges of projected net positions for the following 10 years. Although the mean projected net position as of FY 2033 is negative, most projection scenarios show a modest positive net position. The mean net position is lower than the median because the range of projected outcomes is unevenly distributed. The magnitude of potential deficits in the worst scenarios is significantly greater than the magnitude of potential positive net positions in the most favorable scenarios. Under the worst scenarios, severe market losses accelerate potential insolvencies for plans that receive SFA, as well as for plans that do not receive SFA. Such market losses lead to a high level of new PBGC claims and a substantial negative net position. The potential for financial upside is much more limited. In favorable scenarios, PBGC does not incur many new claims by the end of FY 2033, but the low level of multiemployer premiums means that the Multiemployer Program's net position does not improve significantly.

As in the past, these projections assume that PBGC maintains its financial assistance at current benefit guarantee levels. The projected net position is the present value of future financial assistance, less assets, plus any unfunded amounts for prior years carried forward with interest. The adjustment for unfunded liabilities reflects the current schedule of guarantees and financial assistance in years prior to the projection date.

Figure 6 – Multiemployer Program Projected Net Financial Position
(Mean and Percentile Scenarios)

Historical Experience 2014-2023 and PV 2024-2033 Projections

Legend:
- Projected Mean
- 99th - 85th
- 85th - 50th
- 50th - 15th
- 15th - 1st
- Actual (historical dollars)

Annotation: 69% probability of a positive net position in the ME Program at the end of FY 2033
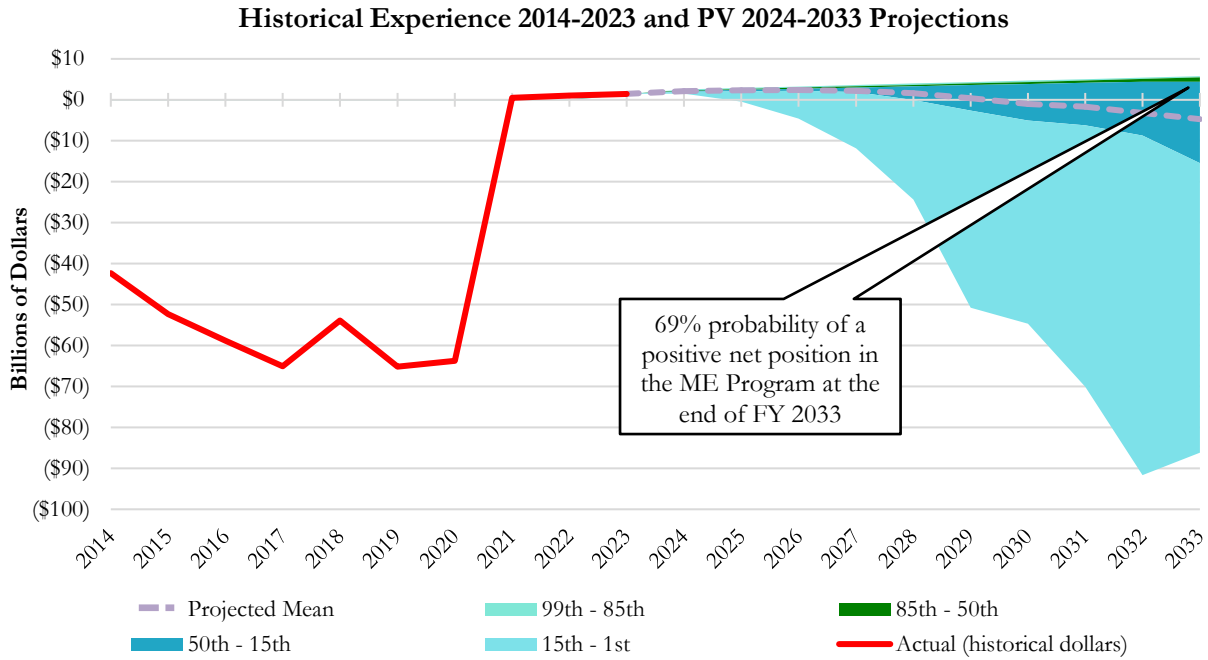
A significant majority of scenarios reflect only a modest positive or negative net position by the end of FY 2033. However, the long, negative tail of the distribution illustrates the wide range of possible deficit outcomes that is consistent with the wide distribution shown in **Figure 6** under the 1st to 15th percentile results. These unfavorable outcomes in the left tail have a low probability before FY 2033, but large negative net positions would become more likely if the projection were extended beyond FY 2033 (as the projection year approaches 2051).[27]

Figure 7 shows the full range of projected outcomes for the net position of the Multiemployer Program in FY 2033. This includes the scenarios that fall below the 1st percentile and above the 99th percentile. For each value of PBGC's projected net position along the horizontal axis, the height of the line shows the frequency of that net position.

---

[27] Section 4262(j)(1) of ERISA requires SFA to be the amount necessary for the plan to pay all benefits through 2051. As a result, the incidence of new PBGC claims is expected to increase over time as the 10-year measurement period for purposes of classifying probable losses approaches 2051.

Figure 7 – Potential FY 2033 Multiemployer Program Net Financial Position
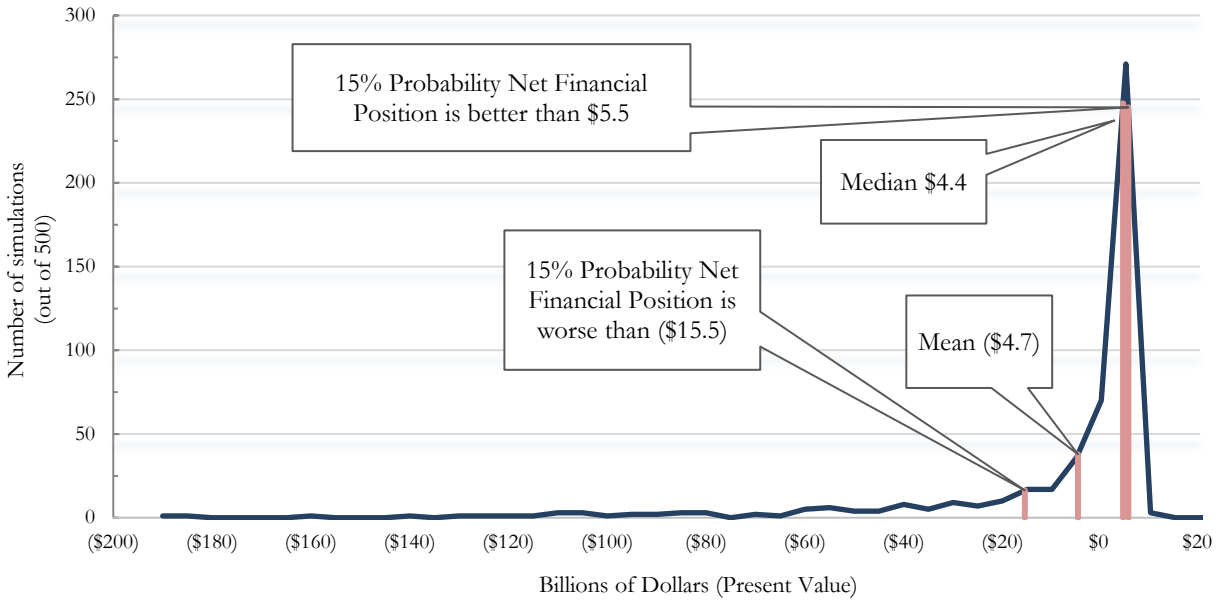
The Multiemployer Program remains exposed to significant risk going forward. Many plans and industries continue to face ongoing challenges, such as fewer active workers and declining contributions. Although SFA will bolster the financial position of eligible plans, future developments in some industries that sponsor these plans could limit their sustainability, leaving workers and retirees in poorly funded plans exposed to continued risks to the security of their benefits, and risks of loss for the multiemployer system.

VARIABILITY IN MULTIEMPLOYER PROGRAM FINANCIAL POSITION

As described above, there is uncertainty in PBGC's Multiemployer Program projections. **Figure 8** shows the mean net financial position and liabilities, along with the results for the 15th to 85th and 1st to 99th percentiles and the range of outcomes for factors that have a significant impact on the FY 2033 net financial position. The considerations related to each factor are explored in the rest of this section.

Figure 8 – Variability in FY 2033 Multiemployer Net Financial Position Present Value at the end of FY 2023 ($ billions)			
	Mean	15th – 85th percentile range	1st – 99th percentile range
PBGC net financial position			
1. FY 2023 actual	$1.5	$1.5	$1.5
2. FY 2033 projected	($4.7)a	($15.5) - $5.5	($86.2) - $5.8
Present value of financial activity expected during FY 2024-2033			
3. New claimsb	($10.6)	($0.1) – ($21.7)	($0.0) – ($86.3)
4. Premiumsc	$4.3	$4.2 - $4.4	$4.1 – $4.5
5. Asset/Liability gain/(loss)	$0.1	($0.7) – $0.6	($5.0) - $9.3
6. Traditional (non-SFA) financial assistance payments	$1.6	$1.5 - $1.7	$1.4 - $1.9

a) If expressed in nominal terms, the mean projected net financial position for FY 2033 is negative $6.1 billion.

b) New claims are the present value of future financial assistance at the time plan insolvency becomes probable by 2033. Approximately 30 percent of new claims are projected to come from plans expected to receive SFA.

c) Premiums plus $4.0 billion in assets as of September 30, 2023, are available to make periodic, traditional financial assistance payments to insolvent plans during the projection period.

Figure 8 shows the present value of estimates of PBGC's net position at the end of the 10-year projection in this report. The variability in results comes primarily from uncertainty around future claims, and to a smaller degree the uncertainty around premium income and investment returns on PBGC assets. Within the 15th to 85th percentile range of outcomes, the Multiemployer Program's present value of projected financial position in FY 2033 varies by $21.0 billion (discounted to September 30, 2023).

New Claims

In the Multiemployer Program, a new claim is booked when an ongoing plan expects to exhaust plan assets and require traditional financial assistance within the following 10 years.[28] A plan that exhausts its assets may terminate via mass withdrawal but is not required to do so. For modeling purposes, ME-PIMS assumes that 60 percent of plans that go insolvent terminate through mass withdrawal and the remaining 40 percent of plans remain ongoing. The amount of the claim is the present value of all future financial assistance payments expected to be made to the plan. The financial assistance payments are estimated by calculating the difference between projected annual plan outlays (i.e., benefit payments at the PBGC guarantee level and plan administrative expenses) and projected annual plan income (i.e., employer contributions and withdrawal liability payments) in each future year following the exhaustion of plan assets. Net new claims are offset by the value of liabilities removed from the books if a plan's financial condition improves and financial assistance is no longer expected to be needed within a 10-year timeframe.

---

[28] A new claim can also be generated when an underfunded plan terminates via mass withdrawal, but in the ME-PIMS model no plans are assumed to go through mass withdrawal prior to insolvency.

As shown in **Figure 8** above, the mean present value of net new claims is about $10.6 billion over the next 10 years. While the median level of net new claims during this period is only $1.0 billion, it reaches $86.3 billion at the 99th percentile scenario. This demonstrates that in the most unfavorable scenarios the Multiemployer Program's financial position could revert back to its pre-ARP levels.

The enactment of ARP in 2021 helped financially troubled multiemployer plans that had been booked as liabilities or may have generated new claims in the coming years. Consistent with **Figure 6** and **Figure 7**, few new claims are projected in the next ten years because SFA is expected to forestall plan insolvencies beyond FY 2043 even in many scenarios where returns are unfavorable. However, in scenarios with poor outcomes, some plans that were "unbooked" after the enactment of ARP are projected to become "rebooked" by FY 2033, which drives up the mean claims amount. The two most significant risk factors for plans becoming "rebooked" are:

- Unfavorable investment returns: Unfavorable asset performance for both SFA and non-SFA assets, particularly during the initial projection years, will accelerate plan insolvencies. Financially troubled plans have limited capacity to recoup large losses when the annual cash outflows are a large percentage of the remaining assets. Asset performance is likely to be correlated between plans, so lower investment returns could have a significant detrimental impact on the solvency of all plans in the program and thus PBGC's future net position.
- Lower-than-expected future contribution income: multiemployer contribution income is driven by the size of the workforce as measured by Contribution Base Units (CBUs) and contribution rate(s). CBU experience is impacted by several factors, such as local and national labor market conditions, industry outlook, non-union competition, local business conditions, technology, productivity and job automation, and employer withdrawals. These factors are difficult to predict over long time horizons. The level of CBUs could deviate significantly from the plan's projections in its SFA application (and from the assumptions used in ME-PIMS). A decline in contribution income could accelerate a plan's insolvency and generate a new PBGC claim.

Premium Income

PBGC premium rates are set by Congress. Unlike the premium rates for the Single-Employer Program, premium levels in the Multiemployer Program do not vary based on a plan's funded position. The Multiemployer Program has only a flat rate premium that is determined based on a plan's participant count and future indexation based on the National Average Wage Index.[29] Consequently, because total participant headcounts do not fluctuate significantly during the projection period, there is little variability in expected multiemployer premium income.

As shown in **Figure 8** above, the mean present value of premium income is about $4.3 billion over the next 10 years and varies by only $0.4 billion between the 1st and 99th percentile outcomes.

Investment Outcomes

Since the 1980s, PBGC does not trustee multiemployer plans. Nearly all of the assets of the Multiemployer Program are held in a Revolving Fund, which collects premium income and pays out Financial Assistance

---

[29] Per ARP, the premium projections include an increase in the flat rate to $52 per participant beginning in 2031.

loans under Section 4261. By law, the Revolving Fund assets must be invested in U.S. Treasuries.[30] Because there are no investments in return-seeking assets, the range of future projected return outcomes for most scenarios is limited. The projected returns are dependent on the Treasury yields projected in ME-PIMS. The $14.3 billion range in the asset/liability gain/(loss) between the 1st and 99th percentiles is driven by scenarios with extreme changes in interest rates over the next ten years, and the corresponding impact on the present value of PBGC liabilities.

MULTIEMPLOYER RECONCILIATION OF FY 2022 PROJECTIONS TO FY 2023 PROJECTIONS

Figure 9 provides a detailed reconciliation of the changes in estimates of the Multiemployer Program's net financial position from last year's FY 2022 projections to this year's FY 2023 projections. ME-PIMS projections of PBGC's multiemployer obligations result in a mean present value of negative $4.7 billion for FY 2033. This is an increase in the net financial position of $2.4 billion from the previous projection of negative $7.1 billion for FY 2032. As shown by row 4 of **Figure 9**, most of the changes to this year's model resulted in an improvement to the projected FY 2033 net position. This change was primarily driven by improved plan funded positions stemming from better-than-expected plan asset performance.

Figure 9 – Reconciliation of Changes in Multiemployer Projection Results Present Value at the end of FY 2023 ($ billions)	
1. FY 2032 Mean Net Financial Position from FY 2022 Projections Report	($7.1)
2. Passage of Time	(1.8)
3. Expected FY 2033 Mean Net Financial Position [(1) + (2)]	($8.9)
4. Changes	
a) New Plan and PBGC Data (including from SFA applications)	2.0
b) New Economic Data and Assumptions	1.9
c) Model Improvements	(0.4)
d) Other Assumption Changes	0.7
e) Total Changes [(4a)+(4b)+(4c)+(4d)]	$4.2
5. FY 2033 Mean Net Financial Position [(3) + (4e)]	**($4.7)**
6. Adjustment from Present Value to Nominal Value	(1.4)
7. Nominal Value of FY 2033 Mean Net Financial Position [(5) + (6)]	($6.1)

Note: The order of changes impacts the magnitude of each individual change but not the sum of all changes.

---

[30] This excludes a portion of assets that must be held in non-interest bearing securities based on requirements under MPRA.

Explanations of the changes in the mean net position shown in **Figure 9** are:

Passage of Time – The FY 2022 report projected PBGC's net position in FY 2032 and presented the results valued in 2022 dollars. To compare this with the FY 2023 report, which projects to FY 2033 with values reported in 2023 dollars, the FY 2022 projections are rolled forward to project one additional year with one less year of discounting. In addition, the FY 2023 projection includes one additional year of projected new insolvencies compared to the FY 2022 projection (i.e., those in the FY 2023 projection are projected to become insolvent through FY 2043, whereas the FY 2022 projection only includes projected insolvencies through FY 2042). The effect of the roll forward from 2022 to 2023 is a reduction of $1.8 billion in the projected net position.

New Plan and PBGC Data – Changes in the starting data between FY 2022 and FY 2023 reflect new plan data provided on plans' Forms 5500. The FY 2023 data also includes data from SFA applications submitted as of December 31, 2023, including SFA amounts as well as projected benefit payments and withdrawal liability income.[31] Additionally, the model reflects zone status certification data through plan year 2023. The primary cause of the improvement in the projections due to new plan data is that the initial plan asset values reported in the 2021 Form 5500 plan filings were higher than last year's ME-PIMS model had projected them to be in 2021. The combined effect of the new data is an increase in the projected net position of $2.0 billion.

New Economic Data and Assumptions – The updated economic data and assumptions in FY 2023 improved the projected net position. Market returns for 2023 far exceeded the average rates of return for 2023 projected in last year's stochastic model. This favorable asset experience is partially offset by lower assumed asset returns projected in future years. The combined impact of the new economic data and assumptions is an increase in the projected net position of $1.9 billion.

Model Improvements – Various programming refinements were made to the ME-PIMS model in conjunction with this report. None of these changes are material, and they are described in the Appendix of this report. The combined effect of these updates decreases the projected net position by $0.4 billion.

Other Assumption Changes – Modifications to assumptions include an update to (1) asset allocations and return assumptions, (2) contribution rate increase assumptions, (3) contribution base unit assumptions for plans that receive SFA, and (4) the mortality tables and improvement scales for determining plan cash flows. Details about each of these assumption changes can be found in the **Changes from the Prior Year** section of the **Appendix**. Reflecting these changes increases the projected net position by $0.7 billion.

SENSITIVITY OF CHANGES TO THE MULTIEMPLOYER MODEL

Discount Rate

The sensitivity information provided below relates to the discount rate used to calculate the present value of PBGC's projected traditional financial assistance payments. Only the discount rate for calculating PBGC liability values was changed; no other related variables, such as inflation or asset returns, are changed in the sensitivity calculations below. The information is presented as present values in FY 2023, but the rate used to

---

[31] For plans that submitted a lock-in application, the model estimates SFA based on plan information as of December 31, 2022. Information about the SFA Waiting List and lock-in applications can be found: https://www.pbgc.gov/arp-sfa/sfa-application-guidance-non-priority-group-plans

discount the projected FY 2033 net financial position back to FY 2023 is not changed for this sensitivity analysis.

Figure 10 – Sensitivity of Net Financial Position to Discount Rate Changes Present Value at the end of FY 2023 ($ billions)			
	+50 Basis Points	**Baseline**	**-50 Basis Points**
FY 2033 Multiemployer Net Financial Position	($3.3)	($4.7)	($6.5)

If market prices for annuities were based on discount rates 50 basis points higher than in the baseline projections, the mean present value of the FY 2033 Multiemployer Program net position would improve by $1.4 billion. Discount rates 50 basis points lower would worsen the mean net position by $1.8 billion in FY 2033.

SINGLE-EMPLOYER PROGRAM

SINGLE-EMPLOYER PROGRAM OVERVIEW

PBGC's Single-Employer Program covers defined benefit pension plans that generally are sponsored by a single private-sector employer. The Single-Employer Program covers about 20.6 million participants in about 23,500 pension plans. The Single-Employer Program's financial status has evolved from historical deficits to a positive net financial position projected to grow over the next 10 years. None of this year's projected scenarios result in PBGC's Single-Employer Program running out of money or entering a negative net position within the next 10 years. The projected growth in the net financial position over the upcoming 10-year period is due primarily to expected premium revenue exceeding the cost of expected claims.

The information in this report starts with PBGC's existing assets and liabilities as of September 30, 2023. However, because the variable rate premium (VRP) for the majority of single-employer plans is based on interest rates and assets as of January 1, the projection incorporates actual economic and PBGC financial experience for the quarter ending December 31, 2023. SE-PIMS is used to project:

- Future premium income,

- Assets and liabilities for single-employer plans that may become future PBGC claims and increase PBGC's net benefit obligations (assets include plan assets and additional assets that may be recovered from the sponsors of terminating plans),

- Liabilities for plans currently trusteed by PBGC, and

- Future investment income on PBGC assets, based on PBGC's investment policy and asset allocations.

SINGLE-EMPLOYER PROJECTIONS OF NET FINANCIAL POSITION

The FY 2023 projections show that the Single-Employer Program net financial position is likely to continue to improve. This pattern is similar to the projection reported last year.

Figure 11 shows PBGC's actual net position for FY 2014 to FY 2023 and selected ranges of projected net positions for the next 10 years. As shown in the FY 2023 Single-Employer Program financial statements, assets of $130.9 billion and liabilities of $86.3 billion result in a positive net position of $44.6 billion at the beginning of the projection period. The widening cone of results shows that the uncertainty around the net position grows in the future. This year's mean projected present value net position in FY 2033 is $71.6 billion, an increase of $8.0 billion from the comparable numbers in the FY 2022 report. Expressed in nominal terms, the mean projected net position in FY 2033 is $100.4 billion.

Figure 11 – Single-Employer Program Projected Net Financial Position (Mean and Percentile Scenarios)

Historical Experience 2014-2023 and PV 2024-2033 Projections
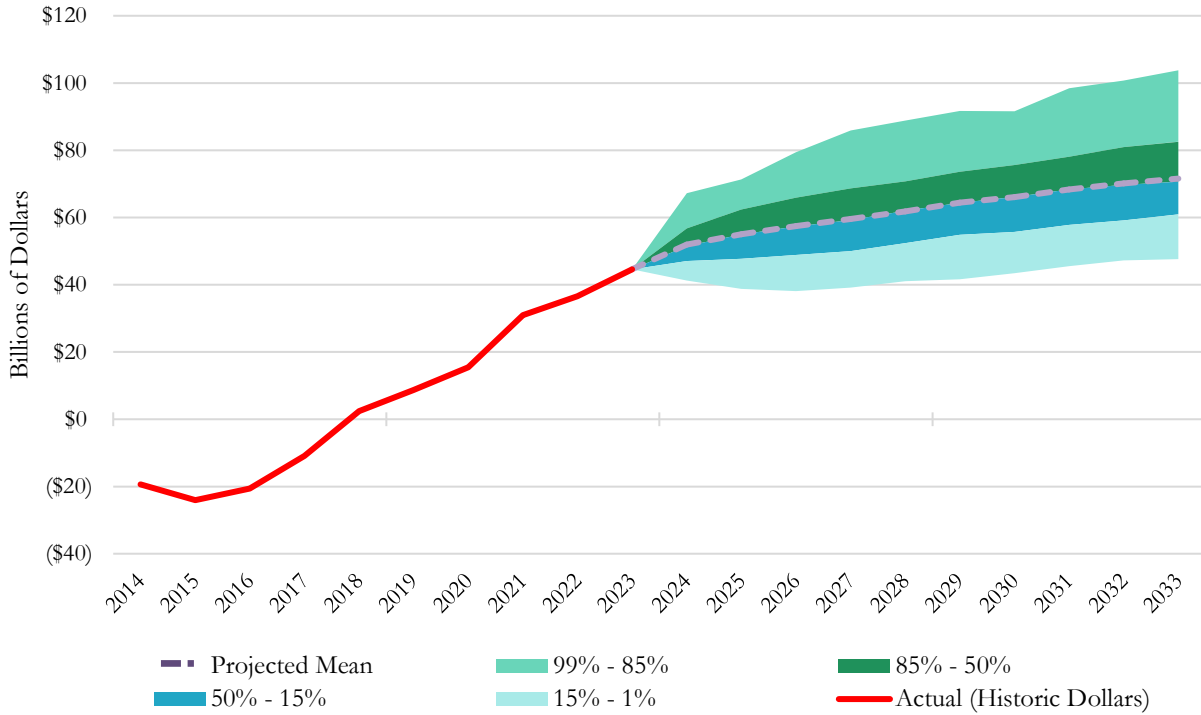
PBGC's net position is projected to improve over the 10-year period because premiums are projected to exceed expected claims, as they have in the recent past.

Figure 12 shows the full range of the 5,000 outcomes projected by the model for PBGC's Single-Employer Program's financial position for FY 2033. This includes the scenarios that fall below the 1st percentile and above the 99th percentile. For the Single-Employer Program projection, there are no scenarios that result in a negative net position. For each value of PBGC's projected net position along the horizontal axis, the height of the curve shows how many paths have that net position as a result. The higher the curve, the more simulations have results at that point in the distribution. The further any point is to the right of the curve, the better the financial position associated with that point.

Figure 12 – Potential FY 2033 Single-Employer Program Net Financial Position
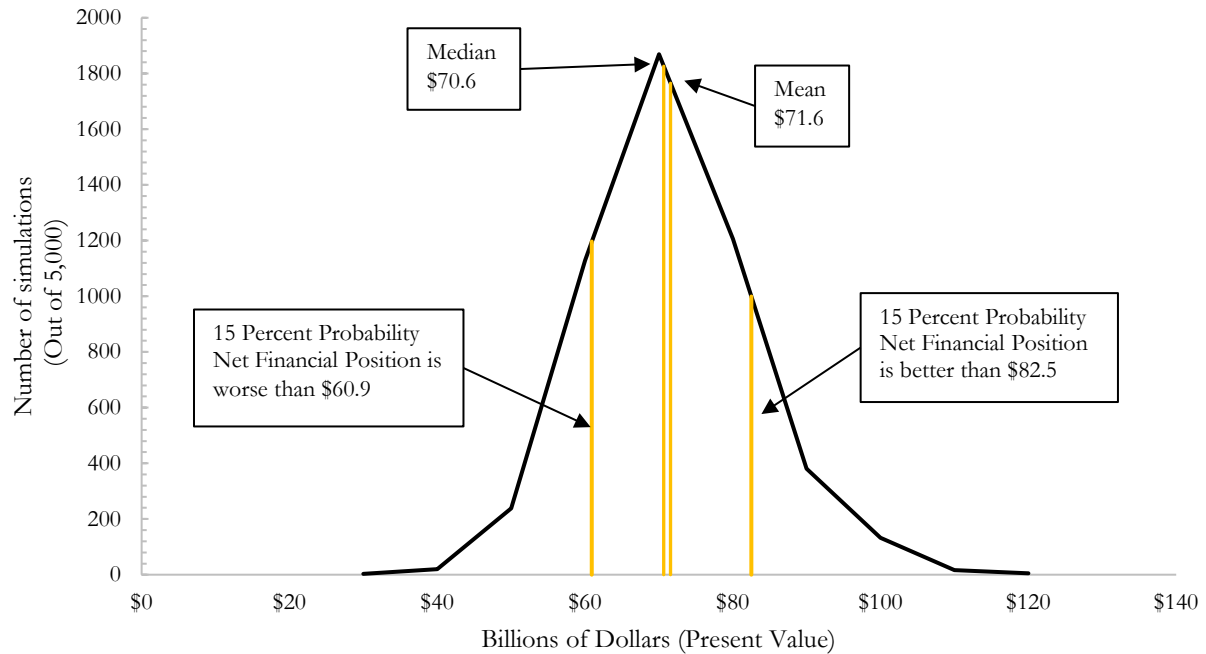
Vertical lines on the graph show the present value of PBGC's projected FY 2033 net position at the 15th and 85th percentiles and the mean and median values of projected net positions. The median is a $70.6 billion positive net position in FY 2033, while the mean is a $71.6 billion positive net position. The potential range of results for the FY 2033 net position ranges from $25.4 billion to $116.1 billion.

The distribution of outcomes illustrated in **Figure 11** and **Figure 12** shows a narrower range of projected results than in the FY 2022 Projections Report. This is due to a model improvement made to more accurately reflect gains and losses associated with changes in interest rates. The update better aligns changes in projected PBGC assets with changes in PBGC liabilities consistent with PBGC's investment policy, and narrowed the range of projected net positions from the 15th to 85th percentiles by $13.5 billion compared to last year's report. The modeling update is described in more detail in the "Capital Market Assumptions" section of this report's Appendix.

VARIABILITY IN SINGLE-EMPLOYER FINANCIAL POSITION

As described above, there is uncertainty in PBGC's Single-Employer Program projections. **Figure 13** shows the mean net financial position and liabilities, along with the results for the 15th to 85th and 1st to 99th percentiles and the range of outcomes for factors that have a significant impact on the FY 2033 net financial position. The considerations related to each factor are explored in the rest of this section.

Figure 13 – Variability in 2033 Single-Employer Net Financial Position Present Value at the end of FY 2023 ($ billions)			
	Mean	15th – 85th percentile range	1st – 99th percentile range
PBGC net financial position			
1. FY 2023 actual	$44.6	$44.6	$44.6
2. FY 2033 projected	$71.6ª	$60.9 - $82.5	$47.6 - $103.8
Present Value of financial activity expected during FY 2024 – FY 2033			
3. New claims	($5.7)	($1.1) - ($10.9)	($0.0) - ($25.5)
4. Premiumsᵇ	$29.5	$21.9 - $38.4	$19.8 - $51.8
5. Asset/Liability gain/(loss)	$3.2	($8.7) - $15.1	($21.6) - $37.4
6. Benefits paid	$71.7	$66.6 - $77.2	$62.6 - $91.4

a) If expressed in nominal terms, the mean projected net financial position for FY 2033 is $100.4 billion.

b) $29.5 billion mean premium income is the sum of $16.4 billion in flat-rate premium income and $13.1 billion in variable-rate premium income. The variability in premium income is largely attributable to VRPs.

Figure 13 shows the present value of PBGC's estimated net position at the end of the 10-year projection in this report. The variability in results comes from the uncertainty around future claims and premium income, which fluctuate with changes in plans' underfunding, and investment returns on the portion of PBGC assets not matched to PBGC's benefit liabilities.[32] Within the 15th to 85th percentile range of outcomes, the Single-Employer Program's present value of projected financial position in FY 2033 varies by $21.6 billion (discounted to September 30, 2023).

Bankruptcy and New Claims

When companies in bankruptcy or financial distress terminate their underfunded plans, that underfunding is the basis for a new PBGC claim. A claim is the excess of the present value of the plan benefits that PBGC is expected to pay over the value of the plan's assets and any recovery from the sponsoring firm. A "new claim" is the claim for a plan that was not included in the most recent financial statements.[33] **Figure 13** shows the mean and the range of outcomes for new claims.

In **Figure 14**, the full shaded area represents the 1st to 99th percentile level of claims and the inner banded areas shown in dark green and dark blue represent the range of outcomes between the 15th to 85th

---

[32] Some of the variability associated with PBGC Asset/Liability gains and losses is due to model limitations on how PBGC assets are matched to PBGC liabilities. This year's SE-PIMS model was updated to improve this methodology.

[33] No specific determination of future "probable" claims is included in the projections for single-employer plans because the model does not attempt to predict future short-term PBGC accounting classifications of troubled plans that are close to terminating but have not yet terminated.

percentiles.[34] The projections displayed for net new claims are for each year's results, so patterns in the amount of variability reflect long-term trends rather than cumulative effects. The projections show a downward trend in expected claims over the 10-year period, largely due to continued projected improvements in plan funding resulting from expected plan contributions and projected plan asset returns exceeding growth in plan liabilities. Recent improvements in plan funded levels, as well as the projected continued improvements, are illustrated in **Figure 20** of this report. The very high level of claims at the 99th percentile is related to economic crisis scenarios where both the volume of bankruptcies and the amount of pension underfunding increase significantly at around the same time. Scenarios with low levels of claims have favorable economic environments, where both plan underfunding and the likelihood of plan sponsor bankruptcies is low.

Figure 14 – Single-Employer Program Net New Claims
(Mean and Percentile Scenarios)

Historical Experience 2014-2023 and PV 2024-2033 Projections
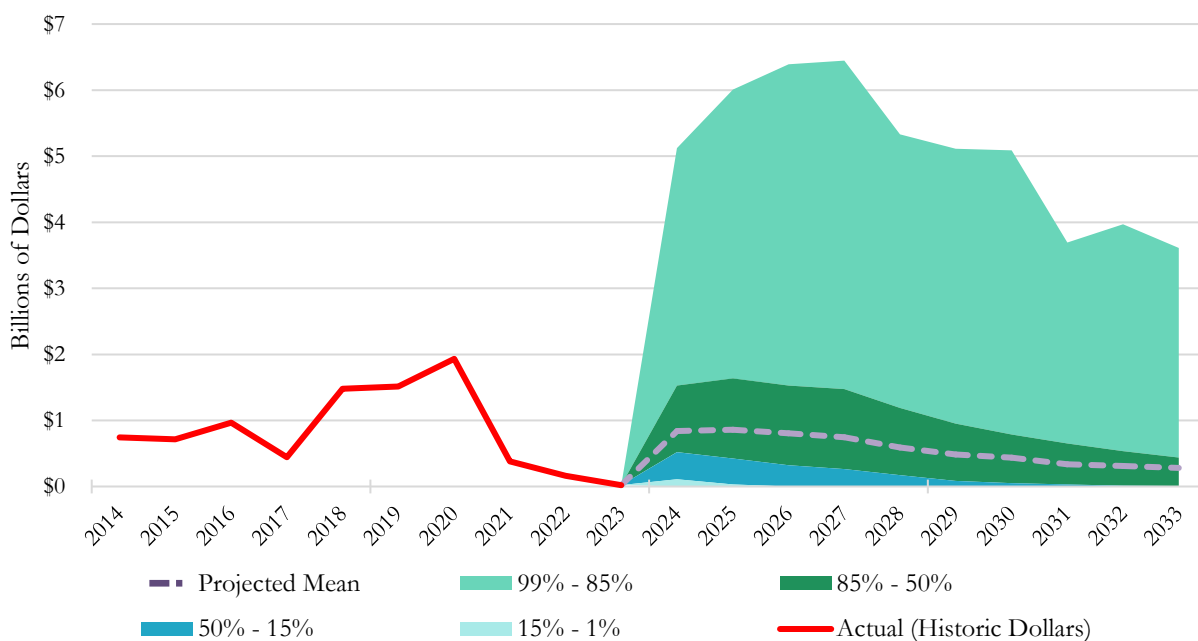
Figure 13 and **Figure 14** both show a low level of projected claims in favorable projection scenarios (approximately $1.1 billion total from FY 2024 to FY 2033 at the 15th percentile). This claims level is significantly smaller than claims historically incurred by PBGC even during periods of low incurred claims. This is primarily due to better plan funded levels and the assumption that, in the event of a bankruptcy, well-funded plans will terminate via standard terminations rather than generate PBGC claims. The level of claims in the worst-case scenarios (approximately $25.5 billion total from FY 2024 to FY 2033 at the 99th percentile)

---

[34] **Figure 14** does not include claims for plans currently booked by PBGC, but not yet terminated ("Probable" plans). Since these plans had not terminated as of September 30, 2023, their claims are not included in the historic claims and they are excluded from the projections of future claims (since they are reflected in the balance sheet values that are projected forward in PIMS).

is approximately $19.1 billion lower than the Single-Employer Program's net position at September 30, 2023.[35]

Premium Income

PBGC's premium structure and levels are set by Congress, but VRP income varies based on changes in single-employer plan underfunding and fixed rate premium income due to changes in the number of plan participants. For example, fixed rate premiums typically decrease when plans terminate, pay lump sums, or transfer plan liabilities for some participants by purchasing group annuity contracts from an insurance company. VRPs increase when plan underfunding increases, for example, due to investment losses or declines in interest rates.

Even though additional premium revenue improves PBGC's net position, higher VRPs are associated with downside scenarios where plans have higher levels of underfunding. In other words, when the size of potential claims increases, premiums also increase, and vice versa, which reduces the ultimate impact of interest rates and investment returns on PBGC's future net position. The combined effect of PBGC's liability-driven investment strategy, discussed below, and the premium structure helps dampen volatility and mitigate risks in the Single-Employer Program.

Single-employer plans have collectively improved their funded status over the past couple years as interest rates have increased and plan assets have enjoyed favorable returns. The improvement in funded status leads to a reduction in PBGC's projected variable rate premium income. Over the past decade, the majority of the Single-Employer Program's premium income has come from variable rate premiums. In the future projection years, the majority of premium income is projected to come instead from flat rate premiums.

Investment Outcomes

When PBGC trustees a single-employer plan, the plan's assets are transferred to PBGC's Trust Fund, as are any additional assets recovered from the sponsor during bankruptcy proceedings. Premium income received is invested in PBGC's Revolving Fund, which is invested in Treasury securities. The total pool of Single-Employer Program assets is invested according to PBGC's investment policy, which employs a liability-driven strategy where most of the change in liability due to interest rate changes will be mirrored by changes in the asset value. Thus, although the investment returns for PBGC's assets are somewhat volatile, positive investment returns tend to offset increases in the value of PBGC's liabilities, and negative investment returns tend to offset decreases in the value of PBGC's liabilities. PBGC's investment policy limits return seeking investments to no more than 15 percent of total assets.

Figure 13 shows the asset/liability gain or loss, which reflects all factors that impact PBGC's net financial position other than premium income and claims. This includes the difference between projected investment income and the change in PBGC's liability due to interest rates. The numbers represent the range of cumulative outcomes that lie between the 15th and 85th percentiles and the 1st and 99th percentiles. For the 10-year projection period, the outcome ranges from a loss of $8.7 billion to a gain of $15.1 billion in the 15th to

---

[35] The $25.5 billion is the 99th percentile of cumulative claims over the ten-year period and not the sum of ten individual years of 99th percentile claims levels.

85th percentiles, expressed as present values discounted to 2023. SE-PIMS projects a mean asset/liability gain of $3.2 billion.

The range of projected asset/liability gains and losses is significantly narrower than those provided in the FY 2022 Projections Report (the range of the 1st to 99th percentiles dropped from $86.1 billion to $59.0 billion). This is due to a model improvement that more accurately reflects gains and losses associated with changes in interest rates. The update better aligns changes in projected PBGC assets with changes in PBGC liabilities in a manner consistent with PBGC's investment policy objectives. The modeling update is described in more detail in the "Capital Market Assumptions" section of this report's Appendix.

SINGLE-EMPLOYER RECONCILIATION OF FY 2022 PROJECTIONS TO FY 2023 PROJECTIONS

Figure 15 provides a detailed reconciliation of the projection results due to changes in the model and data from last year's projections to the FY 2023 projections. The mean projected position at the end of the projection period increased by about $8.0 billion, to a present value of projected net position of $71.6 billion. This results from an expected $4.7 billion increase expected solely due to the passage of time, along with various partially offsetting changes due to updated data and changes to the SE-PIMS model that increase the mean net position by $3.3 billion.

Figure 15 – Reconciliation of Changes in Single-Employer Projection Results Present value at the end of FY 2023 ($ billions)	
1. FY 2032 Mean Net Financial Position from FY 2022 Projections Report	$63.6
2. Passage of Time	4.7
3. Expected FY 2033 Mean Net Financial Position [(1) + (2)]	$68.3
4. Changes	
a) New Plan, Sponsor, and PBGC Data	10.1
b) New Economic Data and Assumptions	(2.9)
c) Model Improvements	(4.8)
d) Other Assumption Changes	0.9
e) Total Changes [(4a)+(4b)+(4c)+(4d)]	$3.3
5. **FY 2033 Mean Net Financial Position [(3) + (4e)]**	**$71.6**
6. Adjustment from Present Value to Nominal Value	28.8
7. Nominal Value of FY 2033 Mean Net Financial Position [(5) + (6)]	$100.4

Note: The order of changes impacts the magnitude of each individual change but not the sum of all changes.

Passage of Time. The FY 2022 report projected PBGC's net position in FY 2032 and presented the results valued in 2022 dollars. To compare with the FY 2023 report, which projects to FY 2033 with values reported in 2023 dollars, the FY 2022 projections are rolled forward to project one additional year with one less year of discounting. The effect of the roll forward is an increase of $4.7 billion in the projected net position.

Plan, Sponsor, and PBGC Data. Between the FY 2022 and FY 2023 Annual Reports, PBGC's net position improved more than was projected with FY 2022 SE-PIMS, primarily due to lower claims, higher premium income, interest rates remaining high and favorable asset returns experienced during FY 2023. Additionally, updated single-employer plan and plan sponsor data results in a small increase in the projected net position, resulting from higher projected premium income partially offset by higher projected claims. The combination of all these updates increases the projected net position by $10.1 billion.

New Economic Data and Assumptions. The different economic climate in FY 2023 compared to FY 2022 resulted in changes to the economic assumptions and has a significant impacted the projections in

multiple ways. Plans generally enjoyed favorable 2023 investment returns, which reduced both the projected VRP income and future claims. This impact is partially offset by a reduction in assumed projected future asset returns, which increases both the projected VRP income and future claims. In each case, mean projected premiums change more than claims. The net effect of these changes was a $2.9 billion decrease in the projected net position.

Model Improvements. There were several improvements to the SE-PIMS model, but only one substantive modeling change which was made to more accurately reflect gains and losses associated with changes in interest rates. The update better aligns changes in projected PBGC assets with changes in PBGC liabilities in a manner consistent with PBGC's investment policy objectives. SE-PIMS previously modeled PBGC's investment strategy for managing interest rate risk to depend only on long-term bond yields. The model was refined to include the effects of shorter bond yields on PBGC's investments. The combined effect of the model changes is a $4.8 billion decrease in the projected net position.

Other Assumption Changes. The most impactful assumption change made to the FY 2023 SE-PIMS model was an update to the projection of plan sponsor contributions. Recent data shows that, in an environment of funded status gains driven by capital markets, actual plan contributions have been lower than levels predicted by the model, so SE-PIMS was updated accordingly to better align to this recent experience. The lower projected contributions decrease plan funded levels, which increases projected premium income and claims. The mean projected premiums increase more than claims. Additionally, the mortality assumption was updated to reflect a final rule released by the IRS on mortality for minimum funding purposes and updates to tables used by PBGC to value its liabilities. The changes to the mortality assumptions were not significant. Additionally, the assumption for plan sponsors engaging in retiree annuity purchase transactions was updated to allow for multiple transactions by a plan sponsor during the projection window. The combined effect of these changes is a $0.9 billion increase in the projected net position.

SENSITIVITY OF CHANGES TO SINGLE-EMPLOYER MODEL'S DISCOUNT RATE

The sensitivity information provided below relates to the discount rate for PBGC obligations. Only the discount rate for calculating PBGC liability values is changed; no other related variables, such as inflation or asset returns, are changed in the sensitivity calculations. The information is presented as present values in 2023, but the rate used to discount the projected FY 2033 net financial position back to 2023 is not changed for this sensitivity analysis.

Figure 16 – Sensitivity to Discount Rate Changes in Single-Employer Results Present Value at the end of FY 2023 ($ billions)			
	+50 Basis Points	**Baseline**	**-50 Basis Points**
FY 2033 Single-Employer Net Financial Position	$72.4	$71.6	$70.6

If market prices for annuities were based on discount rates 50 basis points higher than in the base projections,

the mean present value of the FY 2033 Single-Employer Program net position would improve by $0.8 billion. Discount rates 50 basis points lower would decrease the mean present value of the net position by $1.0 billion.

SENSITIVITY OF CHANGES TO SINGLE-EMPLOYER MODEL'S ASSUMED PLAN DE-RISKING ACTIVITY

Figure 17 shows the estimated impact to the projected financial position if the assumed level of certain plan de-risking actions were doubled. These de-risking actions include retiree bulk annuity purchases and voluntary standard terminations modeled by SE-PIMS. For bulk annuity purchases, the baseline model assumes in each year that there will be an 8 percent chance that a plan above 80 percent funded will undergo a bulk retiree annuity buy-out transaction to transfer 40 percent of its retiree liability to an insurance company. Voluntary standard terminations are modeled using parameters from an econometric analysis, based on the funded level of the plan, participant count, and whether the plan continues to offer future benefit accruals. Additional details about these baseline assumptions are described in the **Appendix** of this report. The sensitivity scenarios are shown both in isolation and in combination and include the estimated aggregate reduction in participants attributable to these events.[36]

Figure 17 – Sensitivity to Increases in Plan De-Risking Activity Present Value at the end of FY 2023 ($ billions)				
Mean Results: FY 2024 – FY 2033	**2024-2033 Participant Reduction[a] (millions)**	**2024-2033 Premiums Received**	**2024-2033 New Claims Incurred**	**FY 2033 Mean Net Financial Position**
Baseline report results	2.5	$29.5	($5.7)	$71.6
1. Double the assumed retiree annuity purchases only	4.0	$28.3	($5.8)	$70.4
2. Double the assumed voluntary standard terminations only	2.8	$29.1	($5.6)	$71.3
3. Double both the assumed retiree annuity purchases and voluntary standard terminations	4.3	$27.9	($5.7)	$70.1

a) Includes only participant reductions related to assumed standard plan terminations and bulk retiree annuity purchases, and not participant reductions related to other causes such as demographic changes or lump sums windows.

The results shown in **Figure 17** above illustrate that elevated plan de-risking activity does not have a significant impact on the projected financial health of the Single-Employer Program. The ten-year cumulative

---

[36] The assumption for retiree annuity purchases was doubled by changing only the probability that a plan above 80 percent funded will undergo a bulk retiree annuity buy-out transaction, from 8 percent to 16 percent. The assumption for voluntary standard terminations was doubled by changing only the intercept term in the regression formula from the econometric analysis referenced in this report's **Appendix** from -2.838 to -2.100.

decrease in projected premium income due to a reduced participant count is less than $2 billion in each sensitivity scenario, which is less than 10 percent of projected premium income. The increased retiree bulk annuity purchases result in a small (less than $1 billion) increase in claims due to plans dropping below 80 percent funded after de-risking which triggers a claim upon projected bankruptcy in SE-PIMS.

SINGLE-EMPLOYER STRESS TEST SCENARIO

All scenarios in the current SE-PIMS model project a positive net position in FY 2033. The variability in future net position is dampened because decreases in plan funding positions associated with high claim amounts also result in increases in VRP revenue. However, the baseline SE-PIMS scenarios may not capture the level of extreme events that PBGC could face in the future. Thus, it is informative to consider extreme events that may pose risks to the financial health of the Single-Employer Program. The following describes PBGC's modeling approach and summary projection results for an illustrative example designed to stress test the financial resiliency of the Single-Employer Program.

Annual claims incurred by the Single-Employer Program have not exceeded $2.0 billion in a single year since 2009. Claims typically follow bankruptcies which often spike during and after recessions. For example, the highest period of claims for the Single-Employer Program was 2001 to 2006, following the 2000-2002 recession, when single-employer claims totaled $28.2 billion.[37] Prior to this period of high claims, plan funding had improved significantly and, like today, many plans were fully funded. Approximately two-thirds of the claims from 2001 to 2006 ($18.9 billion) are attributable to 6 of the 10 largest claims events in PBGC's history.[38] The magnitude of the total claims during this 6-year period, adjusted to reflect the same percentage of overall liabilities in today's single-employer universe of plans, would be roughly $34 billion, which is still less than PBGC's positive net position as of September 30, 2023.

A stress scenario was designed to represent a similar high-claims event with a market downturn and elevated rates of bankruptcy. The scenario includes a one-time 33.5 percent drop in equity values for PBGC and plan assets (resulting in a 20 percent reduction in the median asset return for plans in the first year of the projection) and increases in bankruptcy rates such that PBGC incurs roughly $38 billion in new claims from FY 2024 through FY 2029.[39] The claims are concentrated in the first several years of the projection, similar to concentrated multi-year periods of claims in the past. All other model assumptions and methods in SE-PIMS remain unchanged from the primary run described in this report.

Figure 18 shows the mean projection of assets and liabilities in nominal terms of PBGC's Single-Employer Program under both the stress test (dotted lines) and the baseline assumptions used for the rest of this report

---

[37] Annual historical claims for the Single-Employer Program are shown in Table S-4 of PBGC's **2021 Pension Insurance Data Tables**.

[38] These 10 firms are shown in Table S-5 of PBGC's **2021 Pension Insurance Data Tables**.

[39] For modeling purposes, a -20 percent plan asset return was generated by assuming a -33.5 percent return on equities, and the claims level was generated by assuming that plan sponsors with a credit rating of B+ or lower have a 40 percent probability of bankruptcy in each year of the projection. The objective of the modeling is not to identify or predict the most likely type of scenario under which bankruptcies may occur, but to produce a total level of claims close to $34 billion during the first six years of the projection period. This level of claims is in line with the highest level of claims in any single scenario in PBGC's baseline stochastic modeling and is consistent with PBGC's 2001-2006 high-claims event, adjusted for the change in total liabilities in the single-employer universe. The $38 billion in claims over six years exceeds the $34 billion in claims that seeks to represent the 2001 to 2006 claims period, but uses the same economic stressors as the stress tests in the FY 2021 and FY 2022 Projections Reports.

(solid lines). The margin between PBGC assets (dotted green line) and liability (dotted orange line) during the first two years of the projection shows a significant decrease in the positive net position, from PBGC's actual starting net position of $44.6 billion in FY 2023. This initial drop is primarily due to the influx of new claims early in the period, as nearly two-thirds of plan sponsors with a B+ or lower rating go bankrupt in the first two years of the projection. Unfavorable performance in PBGC's trusteed asset pool in the first year of the projection also contributes to the decline in net position. After that, the Single-Employer Program's mean net position improves each year due to higher variable-rate premium income resulting from lower plan funded levels following the initial asset decline. Additionally, the projected claims decrease as the number of plan sponsors with a B+ or lower rating quickly diminishes.

Figure 18 – PBGC Single-Employer Program Assets and Liabilities by Fiscal Year under Stress Test[a]

(Mean Results in Nominal Dollars)
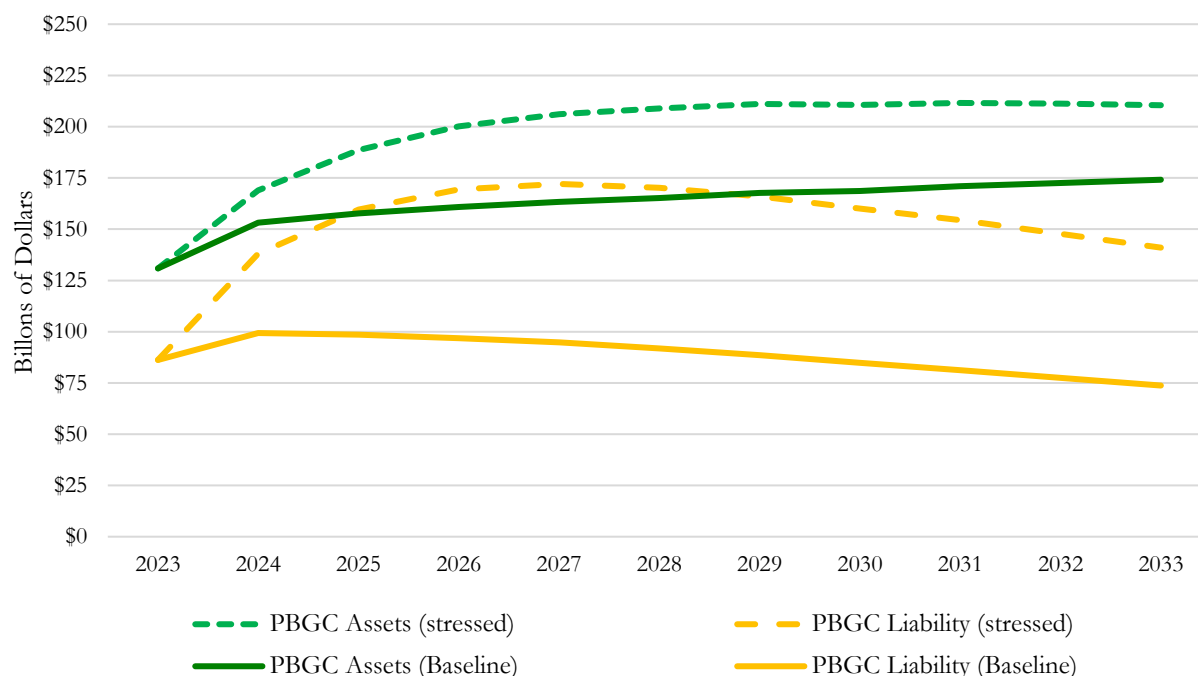
a) The "Stress Test" assumes for all stochastic scenarios: (1) a 33.5 percent drop in equity values resulting in a 20 percent reduction in median plan asset returns in the first projection year; and (2) a 40 percent probability of bankruptcy in each projection year for firms with bond ratings of B+ or lower. All other assumptions and methods are consistent with those modeled under SE-PIMS and described in the Appendix.

Despite the unfavorable experience during the first couple years of the projection period (the large equity drop coupled with significant bankruptcy events), Single-Employer Program assets increase by roughly $80 billion in the first several years of the projection period. This is primarily due to the influx of assets from newly trusteed plans. PBGC would also take on liabilities that exceed the level of these assets. After the first several years, the Single-Employer Program's liabilities drop as PBGC makes benefit payments. Corresponding Single-Employer Program assets are projected to level out as premiums from ongoing plans

and investment earnings on the larger pool of risk-seeking assets offset benefit payments to participants in trusteed plans.

Figure 19 – Projected Changes to PBGC Claims and Premiums under Stress Present Value at the end of FY 2023 ($ billions)			
Mean Results – FY 2023 – FY 2032	Baseline	Stress Test	Increase
New claims	($5.7)	($38.3)	($32.6)
Premiums	$29.5	$42.9	$13.4
Present Value of FY 2033 Net Position	$71.6	$49.4	($22.2)

Figure 19 summarizes the difference in ten-year total projected premiums and claims between the baseline SE-PIMS run and the stress test. The $32.6 billion increase in claims is more than double the $13.4 billion increase in premiums during this period, which accounts for most of the roughly $22.2 billion[40] reduction to the FY 2033 net position for this stress test. However, **Figure 19** also shows that projected premiums are still expected to exceed projected claims from FY 2024 through FY 2033. The projected net position following the period of elevated claims is higher than in last year's stress test.

The stress test scenario described in this report section is illustrative and not intended to be predictive of future experience. Despite the resemblance to actual experience in 2001 to 2006, a future event of this magnitude is unlikely. The scenario is intended to provide insight into the financial resiliency of the Single-Employer Program even in extreme circumstances.

SINGLE-EMPLOYER PLAN UNIVERSE: PROJECTED UNDERFUNDING

A key indicator of risk exposure for PBGC is underfunding in the single-employer plan universe. As previously discussed in this report, high levels of underfunding increase VRP revenue. However, plans that are underfunded also increase the size of and the risk of new claims. The following exhibits illustrate selected stochastic ranges of projected aggregate underfunding for single-employer plans. **Figure 20** presents a ten-year stochastic projection of plan underfunding based on the same baseline assumptions that are used in this report for projecting the PBGC single-employer program's net financial position. **Figure 21** presents a similar projection of plan underfunding, except that plan sponsors are assumed to only contribute the minimum amount required by law.

---

[40] Additionally, there is a $2.9 billion decrease in the projected net position due to PBGC asset/liability losses, caused in large part by investment losses resulting from the assumed 33.5 percent decline in equities, offset by additional investment income on the influx of assets from newly trusteed plans.

Figure 20 – PBGC-Insured Single-Employer Plan Underfunding
Plan Termination Basis: SE-PIMS Baseline
(Mean and Percentile Scenarios)
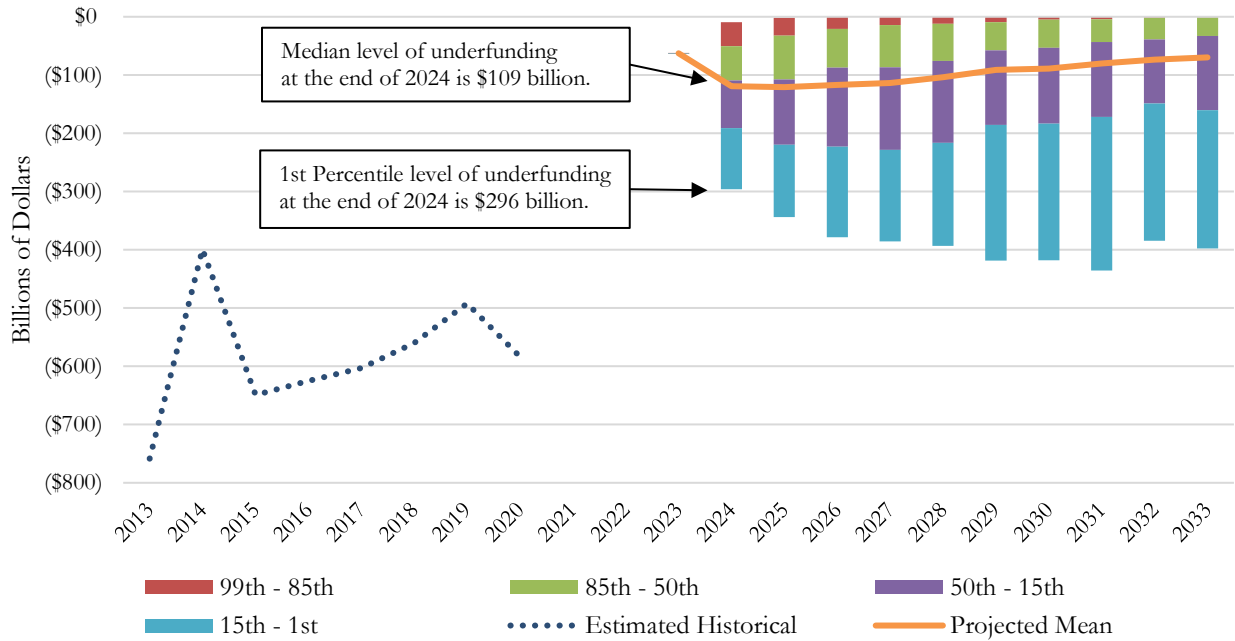
Median level of underfunding at the end of 2024 is $109 billion.

1st Percentile level of underfunding at the end of 2024 is $296 billion.

Legend:
- 99th - 85th
- 85th - 50th
- 50th - 15th
- 15th - 1st
- Estimated Historical
- Projected Mean

Note: The estimated historical levels of underfunding from 2013 through 2020 are determined based on the methodology used in Table S-44 of PBGC's **2021 Pension Insurance Data Tables**; i.e., adjusting plan liabilities reported on Form 5500 filings to estimate the liabilities on a plan termination basis. The projected levels of underfunding on and after 2024 are estimated using SE-PIMS, which utilizes a different calculation methodology to estimate underfunding on a plan termination basis. There are no values shown from 2021 through 2023 because Form 5500 data for these plan years is not available at the time of this analysis.

In 2020, based on Table S-44 of PBGC's **2021 Pension Insurance Data Tables**, system-wide underfunding in single-employer plans is estimated to have totaled $583 billion. By the end of 2023, as projected by SE-PIMS, underfunding is estimated to have dropped to approximately $60 billion. The improved funding levels are primarily attributable to favorable asset returns as well as the significant rise in interest rates beginning in 2022. The mean and median projections in **Figure 20** above show an initial reduction of nearly $60 billion in estimated funded levels from the end of 2023 to the end of 2024, followed by relatively steady improvement thereafter. The initial reduction in funded levels is primarily due to the PIMS model assuming a significant decrease in interest rates in 2024.[41] Funding levels are subsequently projected to improve over the remainder of the projection period as asset returns outpace liability growth and plans contribute above minimum funding requirements.

Both the mean and median levels of projected underfunding illustrated in **Figure 20** show significant and sustained improvement in the projected financial status of single-employer plans from recent years. By the end of the 10-year projection period, the level of underfunding is projected to fall to approximately $70

---

[41] A downward trend in interest rates is assumed during the projection period as described in the **Appendix**. PIMS assumes changes in rates are steeper in the early years of the projection.

billion. Additionally, the full range of stochastic outcomes shows only a minimal likelihood of returning to higher levels of underfunding, with a less than 1 percent chance of reaching $450 billion in aggregate underfunding over the next ten years. Overall, **Figure 20** shows that using PBGC's baseline assumption for employer contribution behavior, PBGC's risk exposure is projected to be generally constrained and explains the modest level of future claims projected in this report.

Under extreme economic conditions, it is possible that plan sponsors may be unwilling or unable to contribute more than the minimum required. **Figure 21** below illustrates a similar ten-year stochastic projection of aggregate plan underfunding based on the same baseline assumptions used in **Figure 20** except that sponsors are assumed to contribute only the minimum amount required under the law.

Figure 21 – PBGC-Insured Single-Employer Plan Underfunding
Plan Termination Basis: Assuming Plans Contribute Only the Minimum Required Amount
(Mean and Percentile Scenarios)
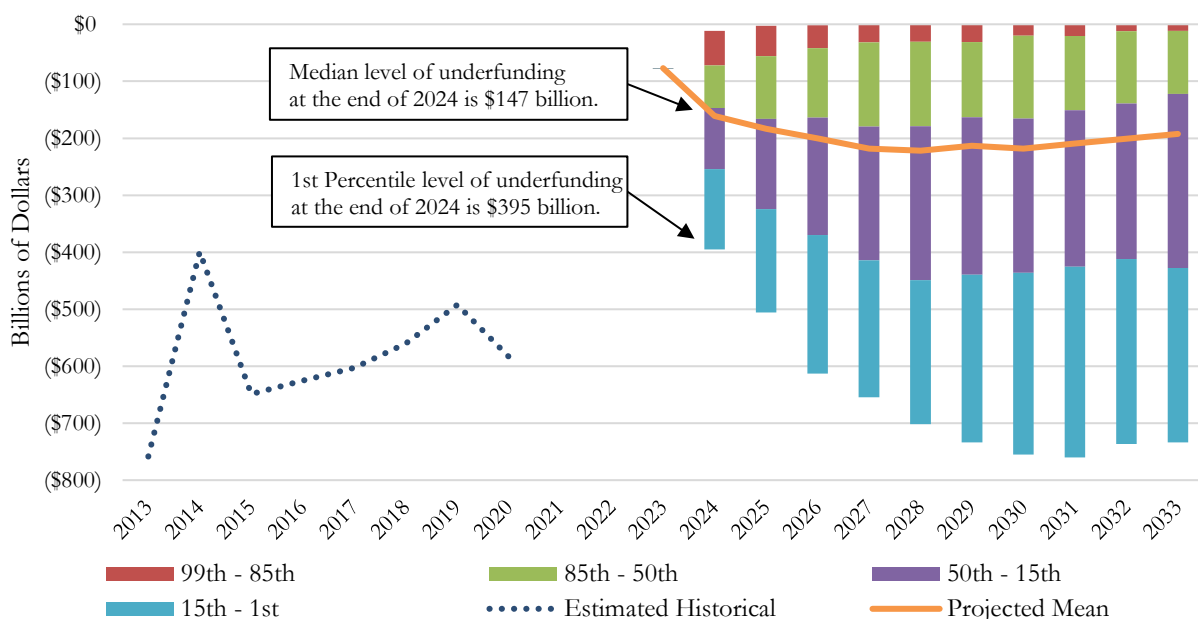
Note: The estimated historical levels of underfunding from 2013 through 2020 are determined based on the methodology used in Table S-44 of PBGC's **2021 Pension Insurance Data Tables**; i.e., adjusting plan liabilities reported on Form 5500 filings to estimate the liabilities on a plan termination basis. The projected levels of underfunding on and after 2024 are estimated using SE-PIMS, which utilizes a different calculation methodology to estimate underfunding on a plan termination basis. There are no values shown from 2021 through 2023 because Form 5500 data for these plan years is not available at the time of this analysis.

Compared to the baseline projections in **Figure 20**, the results in **Figure 21** show roughly double the level of projected underfunding in the mean and median outcomes. Additionally, the range of outcomes is significantly wider under unfavorable projection scenarios. Aggregate underfunding reaches over $400 billion in more than 15 percent of scenarios and can reach over $750 billion at the 1st percentile. Therefore, the results in **Figure 21** serve as a useful point of reference when evaluating the sensitivity of PBGC's future risk exposure to employer contribution behavior.

STATEMENT OF ACTUARIAL OPINION

We, the undersigned, certify that this actuarial evaluation has been prepared in accordance with generally accepted actuarial principles and practices and, subject to the disclaimers herein, to the best of our knowledge, fairly reflects the possible distribution of projected outcomes relative to the operations and status of the Corporation's Single-Employer Program and Multiemployer Program as of September 30, 2023.

The PIMS models are unique in their purpose to model the entire universe of private sector pension plans in the United States as well as PBGC's financial position. Because of that, some aspects of the modeling require methods not typically applied in actuarial practice. Examples include but are not limited to the following: extrapolating results based on a sample of plans, bankruptcy modeling, development of plan benefit payments without participant census data, and estimating behaviors such as single employer contributions and de-risking decisions and multiemployer contribution rate changes and withdrawal payments. Assumptions related to future behaviors may not accurately represent actual future behaviors but have been developed based on research and analysis and are believed to be reasonable. In addition, the broad scope of the models requires simplified approaches to key factors such as capital markets modeling and mortality assumptions.

In preparing this evaluation, we have relied upon information provided to us regarding plan and participant data, plan sponsor financial information, historic asset yield and bankruptcy information and other matters. We have reviewed this information for reasonableness as appropriate based on the purpose of the evaluation. The responsibility for the source information obtained from Forms 5500 and elsewhere rests with the preparers of these data.

Additionally, we have relied on actuaries, programmers, and modelers from PBGC as well as external contractors to maintain, enhance, and run the PIMS models in order to generate the results used in this report. This includes additional reliance on PBGC actuaries and economists to help develop the assumptions and methods used within the PIMS models.

Subject to the disclaimers herein, in our opinions,

(1) The techniques and methodology used are generally acceptable within the actuarial profession.

(2) The assumptions used are appropriate for the purposes of this report.

(3) The resulting evaluation represents a reasonable estimate of the possible distribution of projected outcomes relative to the operations and status of these programs.

The undersigned are available to discuss the material in this report.

I, Theodore A. Goldman, am the Director of PBGC's Policy, Research and Analysis Department (PRAD). I am a Member of the American Academy of Actuaries, a Fellow of the Society of Actuaries, and an Enrolled Actuary. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report.

I, Kevin M. Muse, am an actuary in PBGC's Policy, Research and Analysis Department (PRAD). I am a Fellow of the Society of Actuaries and an Enrolled Actuary. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report.

I, R. Evan Inglis, am the Chief Policy Actuary in PBGC's Policy, Research and Analysis Department (PRAD). I am a Member of the American Academy of Actuaries, a Fellow of the Society of Actuaries, and an Enrolled Actuary. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report.

Theodore A. Goldman, FSA, EA, MAAA
Director, Policy, Research and Analysis Department, PBGC

Kevin M. Muse, FSA, EA
PIMS Division Manager, Policy, Research, and Analysis Department, PBGC

R. Evan Inglis, FSA, EA, CFA, MAAA
Chief Policy Actuary, Policy, Research and Analysis Department, PBGC

APPENDIX

OVERVIEW OF PIMS

The analysis in this report uses ME-PIMS and SE-PIMS, which model pension plans based on estimated data. They use data reported by multiemployer plans and a sample of single-employer pension plans to model the future funding status of the universe of private sector pension plans. Both models project long-term financial outcomes by running many simulations, each modeling year-by-year changes for 20 years into the future. Each simulation starts with known facts about the economy, the universe of PBGC-insured plans, and PBGC's financial position. The models then introduce random year-by-year changes (within certain bounds) to simulate economic fluctuations, producing 500 simulations for alternate economic paths through time. Within a simulation, each plan's outcomes from one year form the following year's starting point for that plan, and so on. The models recognize that all single-employer plan sponsors have some chance of bankruptcy, that all multiemployer plans have some chance of insolvency, and that these probabilities change over time depending on a variety of factors.

Neither PIMS model attempts to model all plan sponsor behavior. However, each model does anticipate certain responses in some key areas. ME-PIMS reflects anticipated employer and plan sponsor behavior through contribution rate assumptions related to zone status, future changes to benefit accruals, MPRA applications, and SFA-related assumptions. SE-PIMS reflects anticipated plan sponsor behavior related to contributions, standard terminations, and bulk annuity purchases for retirees. Plan sponsor behavior is inherently difficult to model and can change in unforeseeable ways as conditions change. This is a limitation of the PIMS models which could be material if certain plan sponsor actions deviate significantly from the assumptions used in the model.

PBGC is not aware of any material inconsistencies among the assumptions used in the PIMS models, nor of any unreasonable output resulting from the aggregation of assumptions.

Future Outcomes Are Expressed in Present Value Terms

This report expresses future outcomes in present value terms (i.e., discounted back to the end of FY 2023), but shows nominal values in certain figures (values discounted to the end of FY 2033 or any intervening year are described as "nominal values" in this report). Results are explicitly noted as expressed in nominal or present value terms. Present values increase when interest rates go down and vice versa.

The uncertainty in future interest rates is modeled in both versions of PIMS. Therefore, interest rates change in each year in each simulation. Each simulation's outcomes are discounted based on the 30-year Treasury bond yields projected for that simulation, regardless of whether the underlying simulated cash flows are generated from holdings of equities, corporate bonds, or U.S. Treasury bonds.

How Projections Compare to PBGC's Financial Statement Liabilities

PIMS treats the most recent PBGC financial statement liabilities as the starting point and estimates how they may vary in the future, adding the effects of projected new claims, benefit payments, and asset returns. The projections of future financial statement information in this report explicitly determine liabilities for plans that

are projected to be "probable for financial assistance" (multiemployer), but not for plans that are "probable to terminate" (single-employer).

Capital Market Assumptions

The following economic variables are stochastically projected in both versions of PIMS:

Interest Rates, Stock Returns, and Related Variables. These variables are determined by the underlying means, standard deviations, and correlation matrix established for the PIMS projections (see **Figure A-1**). Related variables include inflation, wage growth, and increases in benefits for flat-dollar plans.

- Interest rates are represented by the 30-year Treasury yield. They are modeled as correlated over time and with an underlying trend based on the difference, at the start of the simulation, between the 30-year Treasury yield and the expected rate of future inflation. For the 10-year period ending December 31, 2023, monthly values of the 30-year Treasury yield averaged 80 basis points higher than the breakeven inflation rate on 30-year Treasury inflation indexed securities. The trend incorporated in the model adjusts the distribution of projected Treasury yields such that the median projected yield approaches this 80-basis point spread over the median projected inflation rate. The inflation assumption for this year's report is based on CBO's 10-Year Economic Projections released in February 2024.[42] Each year's median PIMS inflation rate is modeled to align with the corresponding rate from the CBO projection through 2034 (the last year of the CBO projection), up to an ultimate median rate of 2.3%. Incorporating the 80-basis point spread between inflation and the 30-year Treasury yield, this results in the projected median value of the ultimate 30-year Treasury yield trending toward 3.1%. The trend rate is estimated using data from the period 1993-2021. The Treasury yield for a given period is expected to be equal to the yield for the prior period, plus the underlying trend adjustment, and plus or minus a randomly generated amount. The underlying trend for this year's report results in a projection of generally falling interest rates, but at any point on a given projected path, interest rates can either rise or fall depending on the randomly generated component of interest rate changes.

- Corporate bond yields and stock returns are modeled based on risk premiums. Credit spreads on investment-grade corporate bonds, relative to 30-year Treasury yields, are assumed to regress toward their historical mean values with no stochastic variation. Excess stock returns, relative to 30-year Treasury returns, are assumed to be independent from one period to the next. To determine a simulated sequence of excess stock returns, the model randomly draws returns from a distribution that reflects historical experience from 1977-2023. Stock returns are more likely to be high when the Treasury yield is falling and vice versa. The random draws affecting the bond yields and stock returns use correlations based on historical data.[43]

---

[42] The inflation assumption is based specifically on the Consumer Price Index, All Urban Consumers (CPI-U), available: https://www.cbo.gov/system/files/2024-02/51135-2024-02-Economic-Projections.xlsx

[43] The analysis is based on data from 1973 to 2007. This assumption was subsequently reviewed by PBGC in conjunction with the FY 2023 Projections Report; it was determined that the estimate derived in that time frame is still representative of current correlation rates.

- Annual wage growth is assumed to have two components: inflation (as described above) and a fixed productivity growth factor applied to each PIMS projected year. The productivity growth factor is derived from the relationship between inflation and average real wage growth over the projection period reported in CBO's 10-Year Economic Projections.[44] Average real wage growth for a given year is calculated from CBO's projections as the growth in wages and salaries (plus proprietor's income) divided by civilian employment, less inflation.

PIMS Representation of Plan Asset Allocation. The asset allocation for all plans is represented by a combination of three economic variables available in both SE-PIMS and ME-PIMS (S&P 500 Return, 30-Year Treasury Return, and 30-Year Treasury Yield). The SE-PIMS allocation is based on an internal study of historical asset returns among large plans that estimated the mixture of the three available economic variables that best fit those historical returns, with returns adjusted down by 2.5 basis points. The ME-PIMS allocation is based on an internal analysis of plan allocations from Form 5500 data that uses characteristics of the asset classes, such as expected returns, correlations, and estimated durations, to fit the data to the three available economic variables.[45] The representation of the plan asset allocation used in SE-PIMS and ME-PIMS is shown in the table below.

Representation of Plan Asset Allocation

	S&P 500 Return	30-Year Treasury Return	30-Year Treasury Yield
SE-PIMS	48%	22%	30%
ME-PIMS*	73%	11%	16%

* Except for the largest plan to receive SFA, where the assumed asset allocation is 100% fixed income, which is represented by a 15%/40%/45% allocation to the factors above

Adjustment to Asset Allocation for Plans with SFA. Plans that receive SFA are assumed to reallocate their non-SFA assets to get as close as possible to an overall "policy" allocation roughly equal to the average allocation from the most recent Form 5500 Schedule R. The policy allocation target is shown below.

---

[44] The CBO's 10-Year Economic Projections are available at: https://www.cbo.gov/system/files/2024-02/51135-2024-02-Economic-Projections.xlsx.

[45] PBGC updated this internal analysis based on more recent Form 5500 filing data. The updated analysis resulted in an increase to the allocation to the 30-Year Treasury Yield and a decrease to the allocation to the 30-Year Treasury Return.

Assumed Policy Allocation Target for Plans with SFA*

Asset Class	Target Policy Allocation %
Equity	46%
Other Return-Seeking Assets	36%
Investment Grade Fixed Income	18%

* Except for the largest plan to receive SFA, for which the target is assumed to be 100% fixed income

Plans with SFA assets are assumed to invest the maximum allowable SFA assets in equities – 33% of SFA allocated to U.S. equity securities and 67% to investment grade fixed income. ME-PIMS determines the allocation of non-SFA assets such that the overall allocation is as close as possible to the "policy" allocation shown above. The ME-PIMS representation using three economic variables is then modified to represent this adjusted allocation of assets. This modification of the PIMS representation of asset allocation is done each year in the projection until the plans deplete all their SFA funds, which are assumed to be used first to pay out benefit payments and plan expenses.

PIMS Projection of PBGC Single-Employer Program Assets. PBGC Single-Employer Program assets are modeled separately for the revolving fund and the trust fund. Revolving fund assets are modeled to be invested entirely in U.S. Treasuries, as required by law. Trust fund assets are assumed to consist of the Single-Employer Program's entire 15% allocation to return-seeking assets (which results in the allocation to return-seeking assets within the trust fund itself exceeding 15%), with the remainder of the fund invested in U.S. corporate bonds. Returns on return-seeking assets are represented by the "S&P 500 Return" economic variable. PBGC's fixed income investment strategy seeks to hedge a certain percentage of its interest rate risk based on the overall PBGC funded ratio. The interest rate sensitivity of the fixed income portfolio increases with both the maturity of the bonds in the portfolio and the size of the portfolio. Prior years' modeling was constrained to holding only long-term bonds. As PBGC's assets, and its fixed income portfolio, have grown relative to its liabilities, the modeling has become increasingly oversensitive to interest rate changes. Therefore, the methodology for modeling PBGC's fixed income has been changed for the FY2023 Projections Report to better capture PBGC's investment strategy. For this purpose, estimated yield curves are derived in each scenario and projection year for both Treasuries and corporate bonds by fitting PBGC's modeled 30-year Treasury yield and long-term bond yield to an average yield curve shape based on data from 2003-2018. Using these yield curves, bond returns are derived based on the applicable duration required based on the modeled fixed income strategy for mitigating interest rate risk.

PIMS Projection of PBGC Multiemployer Program Assets. PBGC Multiemployer Program assets are assumed to be invested entirely in U.S. Treasuries, as required by law. The assumed return is determined based on the yield and changes in the yield of 30-year Treasuries.

ME-PIMS

ME-PIMS — Overview

Each fiscal year-end, PBGC analyzes insured large (over 35,000 participants) and medium (between 2,500 and 35,000 participants) multiemployer plans to identify those ongoing plans that might become claims against the Multiemployer Program. In determining whether a plan should be recorded in PBGC's year-end financial statements, PBGC evaluates whether the plan is likely to become insolvent within the next 10 years in which case it is labeled "probable" and booked as a liability and income statement expense. In addition, PBGC discloses the aggregate dollar amount of those multiemployer plans projected to become insolvent within the next 11 to 20 years, which are labeled "reasonably possible".

To estimate future claims against the Multiemployer Program that are not already booked in the current financial statements, ME-PIMS projects, separately for each simulation, a plan's funding status, cash flow, asset base, and change in the contribution base, to determine whether that plan would be booked as a liability according to the criteria described above.

ARP has been reflected in the FY 2023 ME-PIMS projections by assuming that all plans that become eligible for SFA under section 4262(b) of ERISA by the 2022 plan year will apply for and receive SFA payments. Current estimates of projected SFA payments are not shown in this report as obligations of PBGC nor are the payments included in the cash flow exhibits (unless specifically noted). However, plan solvency forecasts, projected PBGC liabilities, and traditional financial assistance reflect actual and estimated SFA payments to eligible and approved plans.

ME-PIMS — Data

The model uses Form 5500 data for each plan in the universe of multiemployer plans, including terminated and insolvent plans. Selected numeric entries from Schedules MB, R, and H/I are downloaded from the Form 5500 datasets to the PIMS database.

A sample of plans for which PBGC has complete data, information on plan provisions, demographics of active workers, and plan assumptions as to future demographic changes is used to impute data to other plans of similar size, demographics, or industry, as appropriate. A brief description of the methodology follows:

- Plans in the current year's ME-PIMS database are categorized into major industries.

- Within each industry, the 25th percentile, the 75th percentile, and the median active-to-inactive ratios are determined.

- For each plan not in the sample, the downloaded data is extended by imputing plan provisions, census information, and assumptions from the closest match to the 25th percentile, the 75th percentile, or median active-to-inactive ratio.

- The set of sample plans and the closest matches were updated from the prior year.

Contributing employers' information is not generally available and thus not used in this model; all contribution information used in this report is on a plan level.

Data is reviewed for outliers and missing fields. Data on critical and declining zone status plans is supplemented with participant notices and other information available to PBGC. The FY 2023 ME-PIMS model utilizes zone status certification data provided by the IRS for plan years 2020 through 2023.

Data on withdrawal liability payments. For plans that have applied to PBGC for SFA, the model uses the projected withdrawal liability payments included in the calculation of SFA. Otherwise, for a subset of plans, withdrawal liability payment data was obtained from the 2021 Schedule MB attachments. For critical and declining plans or plans with greater than 5,000 participants with a greater than 30% change in contributions, market value of assets, actuarial value of assets, total liabilities, current liability normal costs, benefit payments, or total headcounts compared to last year, data was obtained from the 2021 Schedule MB attachments or audit statements. For plans with less than 5,000 participants or plans otherwise not reviewed, an average of the larger plans noted above was used to estimate the withdrawal liability payments. This average was calculated separately for construction industry plans vs "other" plans – with "other" plans further categorized between green/endangered status plans and critical (including declining) status plans.

Data on regular ongoing employer contributions. For all plans, a per capita contribution rate based on the total contributions less withdrawal liability payments (whether actual or modeled) is calculated based on average active participant counts.

Data used from SFA applications. For plans that have applied to PBGC for SFA, some of the cash flow data provided in Template 4 of the application was used in ME-PIMS for the FY 2023 projections. This includes projected benefit payments for retirees and terminated vested participants, which were extrapolated beyond plan year 2051 and calibrated to the current liability reported in the 2021 Schedule MB filing. It also includes the projected aggregate withdrawal liability payments. In addition to data from applications, the model incorporates data from the SFA Waiting List and lock-in applications to improve the estimated timing and amount of SFA payments for non-priority group plans.

Plans that have already been booked in PBGC's financial statements. PBGC collects additional data for these plans, which is subject to confidential treatment requests under 29 CFR 4901.24. This information is used to supplement/override the data treatment described above.

ME-PIMS — General Methodology

ME-PIMS projects PBGC's potential financial position by combining simulated claims with simulated paths for premiums, expenses, PBGC's investment returns, and changes in PBGC liability; that is, the present value of benefits and expenses payable pursuant to claims recognized by PBGC. The probability of any particular outcome is estimated by dividing the number of simulations with that outcome by 500, the number of economic simulations for multiemployer plans.

In each simulation, the model generates 40-year projections for each plan under each of the 500 economic scenarios. The model first generates future benefit payment streams and future normal cost streams from a simulated census. These cash flow streams are then projected forward year-by-year, assuming experience matches the events modeled along each simulated path and that the demographics of future hires are the same as the current active distribution. Projected benefit accruals are adjusted to reflect assumed benefit formula changes (e.g., to a 1% of contribution formula or the removal of early retirement subsidies upon a plan entering critical status) and active population changes.

There is typically a long lag between PBGC's booking of a multiemployer plan and the start of PBGC's financial assistance payments. Payments from PBGC begin only after the plan has depleted its assets. In ME-PIMS' simulation of the Multiemployer Program, a plan can be booked as a probable claim in one year of a projection and then, if the plan's condition improves sufficiently in the simulation, it can become "un-booked" (in the model) in a later year. Conversely, a plan's condition can deteriorate further following the booking.

ME-PIMS — Plan Sponsor Behavior With Respect to MPRA

Multiemployer funding rules create situations where plans may make decisions based on funded status, projected insolvency, or other factors. These behavioral adaptations are modeled to a limited extent in ME-PIMS.

The model assumes that plans in critical status will increase contribution rates and make other plan changes. These assumptions are different for critical status plans that are projected to receive SFA or to "exhaust all reasonable measures" in the future. All critical and declining status plans are assumed to have exhausted all reasonable measures.

The model also reflects suspensions of benefits and partitions for plans projected to be critical and declining after 2023 based on the simulated financial status of the plan in each simulation. Plans that are critical and declining and do not receive SFA prior to 2030 are assumed to make a one-time decision in 2030 whether to apply for benefit suspensions and/or partitions based on the model's assumptions regarding partition and benefit suspension probabilities. Plans projected to receive a partition remain in partition status throughout the projections. Plans that receive SFA are not eligible to apply for a benefit suspension or partition under MPRA.

See the **ME-PIMS Assumptions** section below regarding Benefit Suspensions and Partition for further details.

ME-PIMS models SFA but does not separately model other forms of PBGC financial assistance, such as facilitated merger assistance.

ME-PIMS — Cash Flow Development

ME-PIMS uses information reported on the Form 5500 to develop benefit payment projections by current participant status, which are calibrated to each plan's reported current liability and benefit payments, as well as its normal cost.

Active participant scatters and decrement assumptions are used for approximately 1,000 plans in this year's report, of which data for approximately 350 plans was collected within the past year. The model utilizes this data to simulate active census data for the remaining multiemployer plans based on industry and the plan's active-to-inactive ratio. Cash flows for actives are generated based on the decrement for each of the active age and service cell combinations.

For inactive participants, a different process is used since inactive participant age/service data is not available for all plans. A simplified calibration process extrapolates inactive participants from a census distribution of a large multiemployer plan using each plan's estimated accrual rates and inactive participant count. Across-the-

board shifts in the largest multiemployer plan's inactive census distribution by age and service are then applied to match the current liability reported on Schedule MB of Form 5500. This is done separately for terminated vested participants and for in-pay retirees and beneficiaries.

For plans that have applied to PBGC for SFA, the projected benefit payments for retirees and terminated vested participants provided in Template 4 of the application were used in the cash flow development process. The projected benefit payments were extrapolated beyond plan year 2051 and subsequently adjusted on a pro rata basis across all projection years to calibrate to the current liability reported in the 2021 Schedule MB filing.

ME-PIMS — Assumptions

In addition to the economic variables described above, the modeling of changes to plan active populations is stochastically projected:

Plan Demographics. Starting with the plan's active participant population data from the Form 5500 (grouped by age and service bands), the distribution of active participants for each plan in the future varies according to that plan's actuarial assumptions regarding retirement, disability, and termination of employment. Age and service also vary over time due to hiring assumptions that are determined separately in each scenario of the projections. Hiring patterns vary with stochastic projections; the general assumption is that a plan's historical hiring distribution continues and hiring occurs so that the size of the active population continues at the same trend after plan decrements (retirement, termination of employment, disability) take place.

ME-PIMS does not currently assume industry-specific employment trends. The model incorporates annual variability, with the assumed rate of decline in the active multiemployer population depending on the plan's zone status. The mean net decrease in the active multiemployer population per year across all simulated scenarios is as follows:

- Green Zone (Neither Endangered nor Critical) plans – 1.0%

- Endangered plans – 2.5%

- Critical plans that do not receive SFA – 3.0%

- Critical plans that do receive SFA – 2.0% through 2031 and 1.0% beginning on 2032 and thereafter

- Critical and Declining plans – 5.1%

These assumptions were developed based on a 2021 study of Form 5500 data spanning from 2010 through 2019 as well as assumptions used on SFA applications.

The following non-stochastic assumptions are also used in ME-PIMS projections:

Mortality. The model uses the Pri-2012 Blue Collar Mortality Table, projected to 2031 for retirees and beneficiaries and to 2038 for active and terminated vested participants with the MP-2021 Improvement Scale.

This table is the same table used in PBGC's September 30, 2023, financial statements, and is based on a mortality experience study of PBGC-insured participants.[46]

Additional temporary adjustments are assumed for anticipated excess mortality due to COVID-19 as follows: 2020: 20%, 2021: 16%, 2022: 8%, 2023: 5%, 2024: 4%, 2025: 3%, 2026: 2%, 2027: 1%, 2028 and beyond: 0%. This assumption is based on the same mortality experience study of PBGC-insured participants.

Credit Balances. Each plan's credit balance is increased each year by the plan's valuation interest rate and increased/decreased by the amount by which modeled contributions are greater/less than the minimum otherwise required.

Per Capita Contribution Rate Increases. The annual estimated per capita contribution growth rate is projected as follows:

- Green Zone (Neither Endangered nor Critical) plans – Assumes a rate of increase based on a target rate, with the increases capped at 5.0% per year. The target rate, when multiplied by the active participant count, equals the normal cost plus a 12-year amortization of unfunded liabilities (ignoring credit balances) in three years from each projected valuation anniversary date. The current contribution rate is assumed to increase levelly over three years to achieve the target rate, subject to the maximum increase rates noted.

- Endangered plans – Assumes that plans implement a funding improvement plan that includes contribution rate increases estimated to avoid a funding deficiency and achieve a 33% better funded ratio in 10 years, with a maximum 8% per year increase in per capita contribution growth for up to 12 years. Per capita contribution growth is lowered to inflation after 12 years, or when the cumulative cap is hit.

- Critical plans (except for those projected to receive SFA) – Assumes that plans implement a rehabilitation plan that includes contribution rate increases estimated to eliminate the funding deficiency and bring the plan to 80% funded in 10 years, with a maximum of 8% per year increase in per capita contribution growth for up to 12 years. Per capita growth is lowered to inflation after 12 years, or when the cumulative cap is hit.

- Critical and Declining plans (except for those projected to receive SFA) – Assumes a flat 2.5% per year increase.

- Plans projected to receive SFA – Future contribution rates are assumed to remain level through 2051, and are based on the assumptions described above following 2051.

Per capita contributions for all plans will be further limited to a multiple of the 2019 baseline per capita contribution (based on contributions divided by active participant count from the 2019 Schedule MB), after which inflation/wage growth becomes the underlying increase rate. The multiple is assumed to be 1.25 for plans that receive SFA, 1.50 for plans that are currently in Endangered or Critical status that do not receive SFA, and 2.00 for all other plans.

---

[46] The mortality assumption used in the determination of financial statement liabilities is being updated to use the separate Pri-2012 Blue Collar mortality tables for Retirees and Contingent Survivors. For purposes of the projections used in this report, ME-PIMS has a simplified approach of using the Pri-2012 Blue Collar Nondisabled Annuitant tables for annuitant mortality.

The above contribution rate increases apply until the plan is projected to become insolvent within 10 years; no future increases are applied thereafter.

These assumptions were developed based on an analysis of historical Form 5500 Schedule MB data from 2009 to 2018, as well as professional judgment related to the cumulative level of contribution rate increases that are deemed to be sustainable for plans.

Plan administrative expenses: Expenses are calculated as prior year administrative expenses, excluding investment expenses, increased by 2% per year, and capped at a percentage of each year's projected benefits (the cap ranges from 6% to 15%, depending on plan size). The increase in the flat rate premium to $52 in 2031 (an increase of approximately $7) is added to the above-calculated expense starting in 2031. This assumption is consistent with PBGC's assumptions guidance for SFA calculations.

Benefit Improvements. For green zone plans with a flat dollar benefit formula, benefit increases are assumed to track changes in wages over time. Only future service benefits are increased – no past service benefit improvements are assumed.

Benefit Improvement Restriction. It is assumed that critical and endangered status plans do not adopt future benefit improvements due to restrictions under Rehabilitation Plans or Funding Improvement Plans, respectively.

Withdrawal Liability Payments. For currently terminated and insolvent plans and certain previously-booked plans, a schedule of payments is received from the plan administrators – such payment schedules are then discounted for the possibility of non-payment (predominately due to the potential bankruptcy of a withdrawn employer). The scheduled payments are assumed to "decay" by 2% per year. For all other plans, the prior year actual or modeled withdrawal liability payments are assumed to decline by 30% in the first year (recognizing the one-time nature of lump sum settlements of withdrawal liability that are or may be included in the total withdrawal liability payments) and phase-out over 15 years. Future withdrawals are modeled, and such payments are assumed to phase-out over 20 years. These assumptions were based on internal studies conducted by PBGC based on the payment information for terminated and insolvent plans.

Mass Withdrawal. In the model, no plans are assumed to go through mass withdrawal prior to insolvency. Upon insolvency, 60% of plans are assumed to go through mass withdrawal; the remaining 40% of plans are assumed to remain ongoing. These percentages are based on recent experience. In the case of mass withdrawal, initial year payment assessments by the plan from withdrawn employers are estimated at 120% of the most recent projected year regular contributions, with an adjustment to remove contribution rate increases made after 2014 while the plan is in Endangered or Critical Status. It is assumed that only 70% of employers will commence withdrawal liability payments in the first year. After the first year, withdrawal liability payments are assumed to decay over 20 years from the first year. The assumptions about mass withdrawal liability payments were based on studies conducted by PBGC from the payment information for terminated and insolvent plans and specific payment information. In the case of an ongoing insolvent plan, contributions are assumed to decline by 10% (from the prior year) in the first year of insolvency, and then decrease by 5% per year thereafter.

PBGC Premiums. Premiums are paid in accordance with current law (including the increase in the flat rate premium to $52 in 2031 under ARP) out of plan assets. There is no allowance for write-offs of uncollectable premiums or for the fact that a portion of the premium collected is not credited with interest under MPRA.

Discounting Future Claims. Future claims are valued using a single-equivalent interest discount factor (under each scenario) that models the curve of interest factors described in PBGC's financial statements (using the simulated long-term corporate bond rate generated for the particular year and economic path minus 68 basis points). Those factors are based on a survey of private-sector annuity market prices, and the 68 basis-point adjustment was developed based on internal analysis of the relationship between the long-term corporate bond and Treasury rates and the single-equivalent interest discount factor.

Assumptions about Benefit Suspensions and Partitions. By law, plans receiving SFA are not permitted to implement suspensions or partitions. For non-SFA plans, it is assumed that there is a 12% likelihood that a critical and declining status plan (if it is projected to meet the long-term insolvency test without a partition) will apply for suspension alone; and a 3% likelihood that it will apply for both a benefit suspension and a partition (if it is also projected to pass the long term loss test, it is assumed that it can also pass the "non-impairment test"). The test is applied by the model only in 2030. These probabilities were estimated based on the ratio of plans with approved MPRA applications to the total number of eligible plans from 2016 to 2020. The determination of benefit suspension and partition amounts is based on the following process and assumptions:

- In a partition, the guaranteed portion of benefits for some participants is spun off to a separate, insolvent plan, for which PBGC will provide financial assistance. PIMS uses the input cash flows to calculate the maximum suspension level (110% of PBGC's guarantee, with special protections for certain retirees).

- The assumed average return on plan assets used in MPRA solvency tests is 5%.

- Plans that have gone through a benefit suspension will be re-tested every five years. Deterioration in financial conditions will allow plans to further suspend benefits up to a limit of 110% of PBGC's guarantee. To be conservative, a lower asset return of 4.5% is used to test for suspension percentage changes.

Assumptions specific to SFA determination: The FY 2023 ME-PIMS projection assumes that all plans that become eligible for SFA by the 2022 plan year will apply. Plans that are very close to meeting the eligibility criteria under ERISA section 4262(b) based on information currently available may end up being eligible based on actual circumstances that arise in their 2022 plan years. To account for this possibility, ME-PIMS uses modified eligibility criteria:

- For purposes of determining a plan's zone status for SFA eligibility (only if a plan's zone status for a particular year is not included in the data for plan years 2020 through 2022 as provided by the IRS):
  - Projected contributions are reduced by 5% per year for the first two years, and
  - The solvency threshold for determining critical and declining status is changed to 25 years instead of 20 years.
- The threshold for modified funding percentage is changed to 45% instead of 40%.

For plans that have submitted an application to PBGC as of December 31, 2023, but have not yet been approved, payment is assumed to be made in calendar year 2024. For plans that have not yet applied for SFA but are expected to be eligible, the assumed timing of SFA application submissions is based in part on the SFA Waiting List posted on PBGC's website as of December 31, 2023. Assumed application submissions are spread out through the end of 2026, which is the final year that revised applications may be submitted under ARP. For modeling simplicity, all SFA applications are assumed to be approved in the first filing.

ME-PIMS only estimates SFA amounts stochastically for plans that have not yet applied to PBGC as of December 31, 2023. For plans that have already applied, ME-PIMS uses the amount requested in the most recent application, whether or not the application has been approved, with interest to the assumed payment date.

For plans that have not yet applied to PBGC as of December 31, 2023, ME-PIMS is programmed to replicate a plan's SFA application in each model scenario under which the plan is projected to be eligible for SFA. The initial data used as the basis for the application's SFA calculation is based on the ME-PIMS projection to the assumed application date (which is March 2023 for applicable plans that submitted lock-in applications by March 13, 2023). The SFA is then calculated using a deterministic projection based on assumptions as follows:

- Interest Rates:
  - For plans that submitted a lock-in application:
    - For non-SFA assets, the lesser of 5.85% or the interest rate shown on the 2019 Schedule MB. The 5.85% rate is rounded based on the third segment rate as of December 31, 2022, plus 200 basis points (per ERISA section 4262(e)(3)).
    - For SFA assets, the lesser of 3.75% or the interest rate shown on the 2019 Schedule MB. The 3.75% rate is rounded based on the average of first, second and third segment rates as of December 31, 2022, plus 67 basis points.
  - For plans that did not submit a lock-in application:
    - For non-SFA assets, the lesser of 6.50% or the interest rate shown on the 2019 Schedule MB. The 6.50% rate is rounded based on the third segment rate as of December 31, 2023, plus 200 basis points (per ERISA section 4262(e)(3)).
    - For SFA assets, the lesser of 4.85% or the interest rate shown on the 2019 Schedule MB. The 4.85% rate is rounded based on the average of first, second and third segment rates as of December 31, 2023, plus 67 basis points.
- CBU decline after the measurement date: 2% per year for the first 10 years, 1% per year thereafter.
- Contribution rate increases after measurement date: none.
- Mortality: the same mortality assumption used for other ME-PIMS projection purposes.
- Administrative expenses: the same administrative expenses assumption used for other ME-PIMS projection purposes.

- Withdrawal liability payments – same as the standard ME-PIMS assumptions. This assumes that future employer withdrawal experience for plans that receive SFA is not impacted by the receipt of SFA, which is consistent with intent of the conditions placed on withdrawal liability calculations under PBGC's final rule.

- Other assumptions: no changes from the assumptions used for other ME-PIMS projection purposes.

The assumptions used for the estimated SFA calculations are consistent with PBGC's SFA assumptions guidance document.

Plan Demographics to Facilitate Cash Flow Modeling. To determine cash flows, ME-PIMS utilizes the following assumptions:

- Proportion of population assumed to be male: 75%.

- Age difference: females three years younger than their male spouses.

- Proportion of active population assumed to elect a joint and survivor payment form: 60%.

- Proportion of current retirees assumed to be receiving a joint and survivor payment form: 30%.

- Proportion of terminated vested participants assumed to elect a joint and survivor payment form: 35%.

- Joint and survivor payment form: joint and 50% survivor benefit.

- Proportion of participants assumed married for pre-retirement death benefit: 80%.

- Conversion factors based on PBGC rates for the joint and 50% survivor benefit: 0.9150 for both male and female participants.

Bipartisan American Miners Act. This legislation authorized regular federal funding for the United Mine Workers Association 1974 Pension Plan and amended current law provisions related to federal funding for United Mine Workers retiree health benefits. Since federal funding is the principal source of solvency for this plan going forward, solvency projections for this plan are sensitive to variations in the expected amounts of future federal transfers to the plan. However, the amounts of future federal funding available for the United Mine Workers Pension Plan are not known with certainty because the amounts available for the pension plan depend on the amounts needed each year by certain United Mine Worker retiree health plans, among other things.

Estimated expected transfers to the United Mine Workers Plan used for the projections in this report are the same as those forecasted in the 2025 President's Budget.[47] There are no estimates of transfers to the pension plan beyond FY 2034, so for purposes of the projections in this report, the estimated transfer amount is assumed to stay level after FY 2034 until the United Mine Workers Plan is fully funded.

---

[47] As shown in Item 601 "General Retirement and Disability Insurance" as part of Table 22-12 available:
https://www.whitehouse.gov/wp-content/uploads/2024/03/22-12_fy2025.pdf

SE-PIMS

SE-PIMS — Overview

The amount of PBGC's claims under the Single-Employer Program depend on two factors: (1) the underfunding in pension plans that PBGC insures (i.e., exposure) and (2) the likelihood that corporate sponsors of these underfunded plans will encounter financial distress that results in bankruptcy and plan termination (i.e., the probability of claims). Claims are sensitive to interest rates and investment returns, contributions, benefit changes, industry changes, and economic conditions which impact bankruptcies.

SE-PIMS starts with PBGC's current net financial position and data on the funding status of over 500 of the largest plans, with results for this group scaled up to represent the full single-employer universe. The model produces 5,000 simulations (500 economic paths for each of the 10 bankruptcy simulations). The probability of any particular outcome is estimated by dividing the number of simulations with that outcome by 5,000. The model uses funding and premium rules as prescribed by current law.

SE-PIMS — Data

SE-PIMS uses the data for over 500 actual plans, sponsored by more than 300 companies. These plans represent over half of the liability in the single-employer defined benefit system measured from the 2021 Form 5500 filings. SE-PIMS also reflects contribution data from later years' Form 5500 filings to the extent available when the initial results are generated.

The database includes:

- Plan demographic statistics,

- Plan benefit structure,

- Asset values,

- Liabilities,

- Actuarial assumptions, and

- Plan sponsor financial information.

Plan data are downloaded from Schedules SB, R, H, and I of the most recent Form 5500 into the PIMS database. In addition, information on plan provisions, demographics of active workers, and plan assumptions for future demographic changes are manually entered and reviewed against signed forms and attachments. If demographic information is missing for a particular plan, data from other plans of similar size, demographics, or industry is used for that plan.

The plans included are primarily those with the largest plan liabilities where (1) sufficient data is available on the sponsor for the SE-PIMS bankruptcy probability model and (2) plan details can be sufficiently captured in the SE-PIMS model.

Financial and market data on firms is obtained from Compustat which is provided by S&P Global Market Intelligence and linked to plan sponsors. Where there is missing data for a plan sponsor, data is imputed using industry averages, averages for plan sponsors of comparable size, or other measures.

Historical economic data is gathered from the Federal Reserve Economic Database tables, Interest Rate Tables provided by the Internal Revenue Service, and SBBI® Yearbooks. Data on PBGC's historical financial position is based on PBGC sources, which also supply the information published in PBGC's **Pension Insurance Data Tables**.

PBGC reviews the economic inputs (annual returns of stock and bond market indices, other historical data, generated stochastic paths), regulatory inputs (various Internal Revenue Code pension plan limits and information regarding CPI and national average wage growth), firm data (plan affiliation, firm economic data, weight as part of sample universe), and plan data (Form 5500 data and adjustments) for missing or inconsistent data.

SE-PIMS — General Methodology

The SE-PIMS sample is weighted (scaled up) to represent the full universe of PBGC-insured, single-employer plans. The weighted sample represents total liabilities and underfunding, and the distribution of funding levels among plans in the PBGC-insured universe based on data available as of the preceding spring. SE-PIMS simulates contributions, premiums, and underfunding for these plans.

The weighting process uses scaled copies of the plan sponsors' business (called "partners") and their pension plans. Each partner begins each simulation with the financial conditions copied from their source sponsors but are scaled in relation to the size of each sponsor's balance sheet entries and employment. The financial conditions and bankruptcy experience for each partner is projected separately. Because the SE-PIMS sample is drawn from larger than average plans and corporations, each partner (sponsor and plan size) is scaled to one-fifth the size of its source. The one-fifth ratio was estimated to be the approximate ratio of the average size for all publicly traded defined benefit plan sponsors not included in the PIMS sample to the average size of the plan sponsors in the SE-PIMS sample.

Partners are allocated to sponsors in SE-PIMS to create a weighted sample that approximates the distribution of plan liabilities by funding status in the insured universe. For example, the weighted sample's total value of plan liabilities among plans that are 70 to 80% funded is compared to the same total for the insured universe, and similarly for plans that are 60 to 70% funded (if any), 80 to 90% funded, 90 to 100% funded, etc. Partners are allocated for the best fit to the entire distribution.

SE-PIMS also uses each employer's financial information as the starting point for assigning probabilities of bankruptcy.

Projections of claims against the Single-Employer Program are made stochastically. Claims are modeled by simulating the occurrence of bankruptcy for plan sponsors. The model reflects the relationship from 1980 to 1998 between the probability of bankruptcy and variables representing financial health, such as debt-to-equity ratio, cash flow, firm equity, and employment.[48] For each period, the model assigns random changes in each of these variables for each firm, which are correlated with changes in the economy. The simulated financial health variables determine the probability of bankruptcy for that year.

---

[48] The FY 2017 independent PIMS peer review, required by the Moving Ahead for Progress in the 21st Century Act (P.L. 112-141), titled "Bankruptcy and Mass Withdrawal Modeling in PIMS", dated October 1, 2019, collected updated bankruptcy data through 2017 which verified the appropriateness of the model assumptions.

SE-PIMS models contributions from plan sponsors based on meeting minimum funding requirements, avoiding VRPs, maintaining or regaining prior funding levels (based on liability measurements used in corporate financial accounting), and incentives to attain a funding threshold that eliminates restrictions on the accelerated benefit payments. When sponsors are simulated to experience bankruptcy, the model retroactively overrides modeled contributions for the three years prior to bankruptcy to assume zero contributions for those years.

SE-PIMS — Assumptions[49]

The following variables are stochastically projected:

Sponsor Financial Health Variables. Debt-to-equity ratio, cash flow, firm equity, and employment.

Active Hiring Patterns. Starting with plans' population data from Form 5500, the distribution of active participants for a plan varies throughout the forecast according to that plan's actuarial assumptions regarding retirement, disability, and termination of employment. Age and service also vary over time due to hiring patterns that are determined separately in each simulated path of the projections. Unless the plan is closed to new entrants, PIMS assumes a stationary mean active participation level for the plan. The distribution of ages and benefits for retired and terminated vested participants are imputed from long-term projections of the starting active population and normalized to the actual counts furnished by the Schedules SB. For simplicity, all participants are assumed to be male and are assumed to elect straight life annuities.

Probability of Bankruptcy. Sponsors are subject to a random chance of bankruptcy in each year of the projection. The probability of bankruptcy is based on the relationship between bankruptcies and various measures of companies' financial health. The bankruptcy risks generated for PIMS are compared to market indices, and the largest outliers have their modeled risk recalibrated to equal the mean of the market estimate of bankruptcy risk for their class of bonds. Bankruptcy probability formulas generally do not vary by industry.[50] In bankruptcy, plans with modest levels of underfunding are less likely than severely underfunded plans to result in claims on PBGC. Thus, for modeling purposes, a plan presents a loss to participants and/or the pension insurance program if its sponsor is simulated to experience bankruptcy and the plan is less than 80% funded on a termination liability basis. If the sponsor of a plan is simulated to experience bankruptcy and the plan is more than 80% funded on a termination liability basis, the plan is assumed to be terminated through the standard termination process without becoming a claim for PBGC. The assumed 80% threshold used for this purpose was developed based on internal PBGC analysis of historical claims experience.

Voluntary Standard Terminations of Pension Plans. In addition to the above-mentioned standard terminations related to bankruptcy, SE-PIMS assumes some plans will choose to go through the standard termination process. The probability of a voluntary standard termination is determined using a regression

---

[49] For additional information on SE-PIMS and the assumptions used in running the model, see
https://www.pbgc.gov/sites/default/files/legacy/docs/PIMS-Overview-2011.pdf

[50] SE-PIMS makes an exception for the financial and utilities industries, where relatively high degrees of leverage are considered not to signal a risk of bankruptcy. SE-PIMS also increases the bankruptcy probabilities of a few large companies whose model probabilities greatly underestimate the risk of bankruptcy as measured by their bond ratings.

formula, based on the funded level of the plan, participant count, and whether the plan continues to offer future benefit accruals.[51]

Retiree Annuity Purchases. In each projection year, for plans that have an AFTAP of at least 80%, SE-PIMS assumes that there will be an 8% chance that the plan will undergo a bulk retiree annuity buy-out transaction to transfer 40% of its retiree liability to an insurance company. No more than 50% of plan assets is assumed to be available for an annuity purchase transaction. The model allows more than one such event during the projection. This assumption is based on an internal analysis of the de-risking information provided in the most recent several years of premium filings and the observed trend in participant count changes.

The following non-stochastic assumptions are also used in SE-PIMS projections:

Adjustment to Claims Amount. When sponsors are simulated to experience bankruptcy, the model retroactively overrides modeled contributions for the three years prior to bankruptcy to assume zero contributions for those years. The model then assumes PBGC recovers 5% of the resulting gross claim amount.

Mortality.[52] For the present value of PBGC benefit payments: separate tables depending on whether benefit payments have commenced as follows:

- Annuitants: Pri-2012 Total Dataset Retiree male table with specific ten-year age band adjustments from ages 55 to 104
- Non-Annuitants: Pri-2012 Total Dataset Employee male table with ages set forward three years
- Mortality Improvement: MP-2021 with additional temporary adjustments for anticipated excess mortality due to COVID-19 as follows: 2023: 5%, 2024: 4%, 2025: 3%, 2026: 2%, 2027: 1%, 2028 and beyond: 0%

These assumptions, including the specific ten-year age band adjustments, match the mortality assumptions used for healthy male participants in PBGC's September 30, 2023, financial statements which is based on a mortality experience study of PBGC-insured participants.

For the sample plans' year-by-year experience mortality: the same mortality assumptions as above along with the following temporary adjustments for assumed excess mortality: 2020: 20%, 2021: 16%, 2022: 8%. The excess mortality rates for these years were based on the excess mortality rates published by the Society of Actuaries in Section 3.2 of the RPEC 2023 Mortality Improvement Update.

For purposes of determining minimum funding requirements

- Prior to 2024: RP-2006 male (with separate annuitant and non-annuitant tables) generationally projected from 2006 using the following mortality improvement scales as under IRC Section 430:
  - 2023: MP-2021
  - 2022: MP-2020
  - 2021: MP-2019
  - 2020: MP-2018

---

[51] Based on the "preferred" approach described on pages 38-39 of the PIMS Peer Review report entitled "Single-Employer Risk Transfer Activities": https://www.pbgc.gov/sites/default/files/se-risk-transfers.pdf

[52] PBGC uses a mortality table based on the actual experience of trusteed plan populations with generational projections to determine the pension benefit liability in the Annual Report.

- 2024 and later: Pri-2012 male (with separate annuitant and non-annuitant tables) generationally projected from 2012 using 2024 Adjusted MP-2021 (per Treasury regulation § 1.430(h)(3)-1(b)(1)(iv)(A)). The adjustment to MP-2021 eliminates any mortality improvement during 2020, 2021, 2022, and 2023 (while retaining any projected mortality deterioration for those years), and caps future improvements at 0.78% (based on SECURE 2.0).

It is assumed that plans that reported use of a substitute mortality table use mortality rates 9% higher than the otherwise assumed funding mortality table. [53]

Contributions and Credit Balances. Contributions are assumed to be driven by incentives such as complying with minimum funding requirements, reducing the VRP, and maintaining funded status at certain levels that are potentially based on accounting, termination, or other liability measures. The primary funded ratio measure assumed for the VRP reduction behavior is the vested benefit liability (VBL) used to determine the VRP. The VBL without regard to 24-month averaged interest rates under the Alternative Premium Filing Method (Standard VBL) is used to measure funding status for other purposes. The statutory minimum required contribution (reflecting maximum allowable credit balance usage) is assumed to be a floor. For plan sponsors that experience bankruptcy in the projections, contributions for the three years prior to bankruptcy are reduced to zero.

Plans that are not required to pay a VRP because of funding above 100% of the Standard VBL are assumed to be motivated by different factors than plans that have not funded to that level. The Standard VBL funded level changes throughout the projection period, thus the factors motivating contribution behavior and the parameters used to determine projected contribution amounts also change.

Plans funded above 125% of Standard VBL are assumed to make no contributions.

Plans funded from 100% to 125% of Standard VBL within the last three years are assumed to make the largest of the following contributions.

- Normal cost based on the premium interest rate under the Standard filing method;

- The amount needed to eliminate a portion of the Standard VBL deficit relative to the highest Standard VBL funded ratio in the last three years – 30% of the deficit for plans funded below 110% of Standard VBL, 20% for plans funded above 115% of Standard VBL, otherwise 25%; or

- For plans in which the VBL funded percentage falls below 100%, the amount needed to fully fund the VBL over 1-4 years for plans funded above 80% of VBL, or over 7-10 years for plans funded below 80% of VBL.

Sponsors of plans that have not been funded above 100% of the VBL in any of the past three years are assumed to make contributions that reflect a combination of possible contribution behaviors based on the plan's Adjusted Funding Target Attainment Percentage (AFTAP) or VBL funded ratio, as shown in the tables below. The combination of contribution behaviors represents that plan sponsors in the same circumstances may use different contribution approaches.

---

[53] The 9 percent mortality load assumption for plans using substitute tables for funding is based on a PBGC analysis conducted October 2015 that relies on data regarding variation in mortality by plan from the Society of Actuaries RP-2000 mortality study.

- Sponsors of plans that have an AFTAP below 80% make contributions based on the following combinations of possible contribution behaviors:

AFTAP	Contribution Behavior Percent of Plan Sponsors Assumed to Use Behavior	
	Increase AFTAP to 80%	Minimum Required Contribution (MRC) only, using 90% of available credit balance
0% - 70%	0%	100%
70% - 75%	50%	50%
75% - 80%	100%	0%

- All other sponsors of plans make contributions based on the following combinations of possible contribution behaviors:

Contribution Amount	Contribution Behavior
Max of the two contribution behaviors times the VRP factor	Fully fund VBL over 1-4 years for plans above 80% VBL funded, over 7-10 years for plans below 80% VBL funded
	Eliminate 30% of the deficit relative to highest Standard VBL funded ratio in last 3 years
Plus: this behavior times [100% minus the VRP factor]	MRC, using 90% of available credit balance

The VRP factor is based on the "effective" VRP rate, i.e., the VRP rate adjusted for the impact of the VRP cap. The VRP factor is equal to 50% if the effective VRP rate is $30 per $1,000 unfunded VBL, and is adjusted for different effective VRP rates. The adjustment is based on an interpolation between the 50% VRP factor and either a 100% VRP factor at $100 effective VRP rate and a 0% VRP factor at $0 effective VRP rate.[54]

Actual contributions for 2022 and 2023 were incorporated for plans that had more recent filings than the 2021 Form 5500.

The assumption for plan contribution levels was based on an internal PBGC analysis, summarized by a February 2021 memorandum available on PBGC's website.[55]

---

[54] The effective VRP rate cannot exceed $52, but $100 is used as the endpoint for purposes of the interpolation (i.e., 65.71% is the largest VRP factor at a $52 VRP rate).

[55] The memo is available at: https://www.pbgc.gov/sites/default/files/contribution-policy-assumption-memo.pdf. Updates to the assumption were made to this year's SE-PIMS model, as described in the "Changes from the Prior Year" section of the Appendix below.

Form of Payment. Except for certain cash balance plans, SE-PIMS assumes all benefits will be paid as single life annuities. It is assumed that cash balance plans will pay participants the full accrued benefit (i.e., the account balance) as a lump sum upon termination or retirement unless benefit restrictions apply (see below).

Benefit Improvements. For flat-dollar plans, benefit multipliers are assumed to increase annually by the rate of inflation and productivity growth. For salary-related plans, the benefit formula is assumed to remain constant, but annual salary increases are reflected based on the rate of inflation, productivity growth, and a factor representing merit and seniority.

Benefit Restrictions. The statute provides that certain benefit restrictions apply if a plan's AFTAP is less than a specified percentage and unadjusted assets are less than Target Liability. Liabilities underlying the AFTAP calculation are determined using stabilized discount rates. Assets are generally the actuarial value of assets, reduced by credit balances when the actuarial value of assets does not exceed liabilities. The benefit restriction provisions of section 436 of the Internal Revenue Code are reflected as follows:

- Benefit Improvement Restriction. The benefit improvement restriction applies to benefit increases above the average wage increase and PIMS projects benefit increases at the same rate as wage increases, so the benefit improvement restriction is not applicable for SE-PIMS.
- Lump Sum Payment Restriction. The lump sum benefit payment restriction is reflected to the extent a cash balance plan is projected to have an AFTAP below 80%.
- Benefit Accrual Restriction. Plans with funding percentages below 60% are assumed to freeze benefits and to remain frozen even if the percentage increases above 60% in the future.

Credit Balance Waivers. Because assets underlying the AFTAP calculation are reduced by credit balances unless assets exceed liabilities (see above), sponsors are permitted, or in some cases required, to reduce ("waive") credit balances to the extent needed to avoid benefit restrictions. SE-PIMS assumes that sponsors will choose to waive credit balances to the extent necessary to avoid freezing benefits when funding drops below the 60% threshold. In addition, because cash balance plans are assumed to pay the full accrued benefit as a lump sum, such plans are assumed to waive credit balances to the extent necessary to achieve 80% funding, if possible.

PBGC Premiums. SE-PIMS models premiums based on current law, including the freeze of the VRP rate included as part of SECURE 2.0. There is no allowance in premium projections for write-offs of uncollectable premiums. Premiums are assumed to be paid by the employer rather than from the plan assets. Furthermore, it is assumed that 64% of premiums expected for plan years beginning in a calendar year are reflected as premiums receivable in PBGC financial statements at September 30th of the same year.

PBGC Guarantee Limits. SE-PIMS models the level of benefits that PBGC will pay in projected claims as the lesser of participants' vested benefit levels and PBGC's maximum guarantee level. Circumstances where benefits might be further limited, or where PBGC might be required to pay more than the maximum benefit guarantee level, are not modeled.

PBGC's Assets. PBGC's investment policy as of September 30, 2023, is assumed to remain unchanged, with 15% allocated to return-seeking assets throughout the projection period.[56]

---

[56] PBGC's investment policy can be found: https://www.pbgc.gov/sites/default/files/april-2019-ips-pbgc.pdf

Discounting Future Claims. Future claims are discounted with a single interest factor (under each scenario) representing the curve of interest factors described in PBGC's financial statements (using the simulated long-term corporate bond rate generated for the particular year and economic path minus 68 basis points). Those factors are based on a survey of private-sector annuity market prices.

Determining Discounted Future Present Values Shown in Report Tables. For results presented as present values in this report, the discount rate used to adjust nominal values is the simulated 30-year Treasury rate generated for the particular year and economic path.

SAMPLE STATISTICS FROM FY 2023 RUNS IN ME-PIMS AND SE-PIMS

The following tables show selected output statistics from runs of ME-PIMS and SE-PIMS for this report.

Figure A-1
Arithmetic Means, Standard Deviations, and Correlations of Key Financial Market Values

FY 2023 Single-Employer Model Runs[a] (Across 2024-2033 for 500 Economic Paths)			
	Long-Term Treasury Yield	Return on 30-year Treasury Bonds	Stock Market Return
Arithmetic Mean	3.5%	5.3%	9.1%
Standard Deviation	1.2%	9.4%	20.0%
Correlations:			
Long-Term Treasury Yield	1.00	-0.26	0.00
Return on 30-year Treasury Bonds		1.00	0.20
Stock Market Return			1.00

a) ME-PIMS yields economic returns within 0.1% and correlations within 0.02 of the single-employer results.

Figure A-2
Arithmetic Means and Standard Deviations of Market Rates Derived from Projected Long-Term Treasury Yields

FY 2023 Single-Employer and Multiemployer Model Runs (Across 2024-2033 for 500 Economic Paths)			
	Long-Term Corporate Rate	Inflation Rate	Wage, Salary, and Flat Benefit Growth Rate
Arithmetic Mean	4.5%[a]	2.5%	3.7%
Standard Deviation	1.2%	1.2%	1.2%

a) The discount rate used to value PBGC liabilities and claims is this rate less 68 basis points for both insurance programs.

Figure A-3

FY 2023 Model Projected Plan Returns

(Across 2024-2033 for 500 Economic Paths)

	Single-Employer	Multiemployer[a]
Arithmetic Mean	6.6%	7.7%
Geometric Mean	6.1%	6.8%
Standard Deviation	10.2%	14.9%

a) The projected plan return shown for ME-PIMS is for assets in non-SFA plans.

Figure A-4

Projected Annual Bankruptcy Probabilities[a]

FY 2023 Single-Employer Model Runs (Across 2024-2033 for 500 Economic Paths)	
Arithmetic Mean	0.6%
Standard Deviation	1.9%

a) The bankruptcy probability modeling methods and results are described in Boyce, S. and Ippolito, R.A. (2002), The Cost of Pension Insurance. Journal of Risk and Insurance, 69: 121–170. doi: 10.1111/1539- 6975.00012.

Figure A-5

Annual Rate of Plans' Projected Insolvency

FY 2023 Multiemployer Model Runs (Across 2024-2033 for 500 Economic Paths)	
Arithmetic Mean	0.2%
Standard Deviation	0.2%

CHANGES FROM THE PRIOR YEAR

FY 2023 ME-PIMS includes the following changes from the FY 2022 Projections Report:

Model Improvements. Calculation refinements were made to improve the projection of assets from the amount reported in the Form 5500 Schedule H data to the initial projection year using plan-specific asset allocation data from the Form 5500 Schedule R data.

SFA Assumptions. The FY 2023 ME-PIMS model assumes SFA payments will be made to plans through 2026. Last year's FY 2022 ME-PIMS model assumed payments would be made through 2024, for simplicity. Additionally, for plans that are projected to receive SFA in the model but did not submit a lock-in application to PBGC as of December 31, 2023, the calculation of SFA uses an assumed SFA interest rate of 4.85% and an assumed non-SFA interest rate of 6.50%.

Per Capita Contribution. The initial plan-specific per capita contributions used as the basis for future projection years were developed using 2021 plan year data. Due to the impact of the COVID-19 pandemic on contribution base units, last year's FY 2022 ME-PIMS model used per capita contributions developed based on 2019 plan year data instead of 2020 plan year data.

Contribution Rates. For plans that receive SFA, projected contribution rates are assumed to remain level through 2051. Last year, future contribution rates for these plans were assumed to remain level for 15 years and be increased by national average wage increases (NAWI) thereafter.

For Green Zone (Neither Endangered nor Critical) plans, the rate of contribution increases is assumed to be based on a target rate (as described in the Assumptions section), with the increases capped at 5.0% per year for the duration of the entire projection. Last year's model used this assumption for just the first 12 years, and was lowered to NAWI thereafter.

Active Population. For plans that receive SFA, the average assumed rate of decline in the active multiemployer population is 2.0% through 2031 and 1.0% beginning on 2032 and thereafter. The year-by-year change continues to be projected stochastically. Last year's model used the 3.0% average rate of decline assumed for other Critical status plans.

Mortality Assumptions. The mortality assumptions used to calculate the present value of PBGC financial assistance payments, and for modeling year-to-year projected mortality experience in the ME-PIMS projections, were updated to reflect changes made for the purposes of developing PBGC's financial statement liabilities. See the first few paragraphs of the "Mortality" discussion under the "ME-PIMS — Assumptions" section for additional details.

FY 2023 SE-PIMS includes the following changes from the FY 2022 Projections Report:

Model Improvements. Several programming refinements were made to the SE-PIMS model for FY 2023:

- The methodology for modeling PBGC's fixed income returns has been changed to better capture PBGC's liability driven investment strategy. For this purpose, estimated yield curves are derived in each scenario and projection year for both Treasuries and corporate bonds by fitting PBGC's modeled 30-year Treasury yield and long-term bond yield to an average yield curve shape based on data from 2003-2018. Using these yield curves, bond returns are derived based on the applicable duration required based on the modeled fixed income strategy for mitigating interest rate risk.

- During the projection of plan funded levels from the year of the Form 5500 filing to the beginning of the stochastic projection, the FY 2023 SE-PIMS model was updated to reflect plan contributions reported in the Form 5500 filings even in years where these amounts were below the minimum required contribution calculated by the model; and

- The calculation of plan benefits was refined to reflect a dispersion of benefit levels within a given age/service cohort to impute higher benefit levels associated with highly paid employees within each group. This improves the calculated impact of PBGC's maximum benefit limitation for plans that terminate and become trusteed by PBGC.

Contribution behavior assumptions. Assumed contributions to ongoing plans were updated as follows:

- Contributions are assumed to be $0 for plans where Standard VBL is over 125% funded.

- Contributions for plans with AFTAPs above 80% that have been funded below 100% of the Standard VBL for the last 3 years are assumed to contribute the greater of (1) the amount determined for purposes of reducing VRP or (2) the amount determined for regaining the highest funded position in the last 3 years. Previously, plans were assumed to contribute the sum of (1) & (2).

- For plans that have been funded above 100% of Standard VBL within the last 3 years, the portion of assumed contributions attributable to the target normal cost have been reduced to 100% of the target normal cost (TNC). Previously, plans were assumed to contribute a multiple of the TNC depending on their level of funding above 100%.

Retiree Annuity Purchases. SE-PIMS continues to assume an 8% probability each year that a plan will enter into a retiree annuity buy-out transaction to transfer 40% of its retiree liability to an insurer if the plan had an AFTAP of at least 80% prior to the transaction. This assumption has been updated to no longer constrain each plan to only one such transaction during the projection period.

PBGC Premium Method Election. Plan sponsors are assumed to elect a change in premium method (i.e. Standard Method to Alternative Method, or vice versa) only when there is an estimated premium reduction in that projection year of at least 20% of the premium amount computed under the existing premium method. Last year's model incorporated a change in method for any projected level of premium savings.

Mortality Assumptions. The mortality assumptions used to calculate the present value of PBGC benefit payments, and for modeling year-to-year projected mortality experience in the SE-PIMS projections, was updated to the mortality assumptions used for healthy male participants in PBGC's September 30, 2023, financial statements.

For purposes of determining both minimum funding requirements and the present value of PBGC benefit payments, the improvement scale was updated to reflect the applicable scale in each prior plan year; and the mortality assumptions for 2024 and later was updated to Pri-2012 male (with separate annuitant and non-annuitant tables) generationally projected from 2012 using 2024 Adjusted MP-2021 (per Treasury regulation § 1.430(h)(3)-1(b)(1)(iv)(A)).

Economic Assumptions. Similar to last year's model excess stock returns, relative to 30-year Treasury returns, are assumed to be independent from one period to the next. The distribution used to determine a simulated sequence of excess stock returns was updated to reflect historical experience from 1977-2023. Both PIMS models include updated economic assumptions as noted in the Capital Market Assumptions section

above. The major assumptions are summarized below. The rates shown are the arithmetic mean of the first 10 years of the projection.

Figure A-6		
Economic Assumption Changes for FY 2023 Report **10-Year Arithmetic Mean for Single-Employer and Multiemployer Model Runs**		
	FY 2023	**FY 2022**
Long-Term Treasury Yield [a]	3.5%	3.3%
Return on 30-year Treasury Bonds [a]	5.3%	4.4%
Stock Market Return [a]	9.1%	9.4%
Long-Term Corporate Rate	4.5%	4.5%
Inflation Rate	2.5%	2.7%
Wage, Salary, and Flat Benefit Growth Rate	3.7%	3.9%
Projected SE Plan Returns	6.6%	6.5%
Projected ME Plan Returns [b]	7.7%	7.8%
Annual Bankruptcy Probability for SE Plans	0.6%	0.7%
Annual Rate of Plans' Projected Insolvency for ME Plans	0.2%	0.2%

a) ME-PIMS yields economic returns within 0.1% of the Single-Employer Model.
b) The projected plan return shown for ME-PIMS is for assets in non-SFA plans.