



FY 2021 Projections Report

 Pension Benefit Guaranty Corporation

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
Multiemployer Program	2
Single-Employer Program	3
About This Report	4
Wide Range of Possible Outcomes	5
Financial Obligations	5
About the PIMS Models.....	6
MULTIEMPLOYER PROGRAM	8
Multiemployer Program Overview	8
American Rescue Plan Act of 2021	9
Multiemployer Program Solvency	13
Multiemployer Projections of Net Financial Position	16
Variability in Multiemployer Program Financial Position	18
Number of Plans that Become Eligible for and Receive SFA	19
SFA Amounts Determined for Eligible Plans	20
Changes in the Financial Position of Plans Following Receipt of SFA.....	21
Changes in the Financial Position of Plans that do not Receive SFA	21
Multiemployer Reconciliation of FY 2020 Projections to FY 2021 Projections	22
Sensitivity of Changes to the Multiemployer Model	24
Discount Rate.....	24
SINGLE-EMPLOYER PROGRAM	25
Single-Employer Program Overview	25
Single-Employer Projections of Net Financial Position	25
Variability in Single-Employer Financial Position	27
Financial Position	28
Bankruptcy and New Claims	28
Premium Income	30
Investment Outcomes	30
Single-Employer Reconciliation of FY 2020 Projections to FY 2021 Projections	31
Sensitivity of Changes to Single-Employer Model’s Discount Rate	33
Single-Employer Stress Test Scenario	33
STATEMENT OF ACTUARIAL OPINION	37
APPENDIX	38
Overview of PIMS	38
Future Outcomes Are Expressed in Present Value Terms.....	38
How Projections Compare to PBGC’s Financial Statement Liabilities.....	38
Capital Market Assumptions.....	39
ME-PIMS	40
ME-PIMS — Overview.....	40
ME-PIMS — Data	41
ME-PIMS — General Methodology	42
ME-PIMS — Plan Sponsor Behavior With Respect to MPRA.....	42
ME-PIMS — Cash Flow Development	43
ME-PIMS — Assumptions.....	43
SE-PIMS	50
SE-PIMS — Overview	50
SE-PIMS — Data.....	50
SE-PIMS — General Methodology	51

SE-PIMS — Assumptions	52
Sample Statistics from FY 2021 Runs in ME-PIMS and SE-PIMS	57
Changes from the Prior Year	59

FIGURES

Figure 1 – PBGC Projected Mean Net Financial Position at the End of FY 2031	1
Figure 2 – Projected Change in Key Financial Results	9
Figure 3 – Reconciliation of Changes in Total SFA Estimate	11
Figure 4 – Stochastic Range of Projected SFA Distributions	12
Figure 5 – PBGC Multiemployer Fund Assets, Regular Financial Assistance Payments, and Premiums by Fiscal Year.....	14
Figure 6 – Projected Assets of PBGC Multiemployer Program.....	15
Figure 7 – Multiemployer Program Projected Net Financial Position	17
Figure 8 – Potential FY 2031 Multiemployer Program Net Financial Position	18
Figure 9 – Variability in FY 2031 Multiemployer Net Financial Position.....	19
Figure 10 – Reconciliation of Changes in Multiemployer Projection Results	22
Figure 11 – Sensitivity of Net Financial Position to Discount Rate Changes Present Value at the End of FY 2021 (\$ in billions)	24
Figure 12 – Single-Employer Program Projected Net Financial Position.....	26
Figure 13 – Potential FY 2031 Single-Employer Program Net Financial Position.....	27
Figure 14 – Variability in 2031 Single-Employer Net Financial Position.....	28
Figure 15 – Single-Employer Program Net New Claims	29
Figure 16 – Reconciliation of Changes in Single-Employer Projection Results.....	31
Figure 17 – Sensitivity to Discount Rate Changes in Single-Employer Results.....	33
Figure 18 – Single-Employer Program Projected Net Financial Position under Stress Test	34
Figure 19 – PBGC Single-Employer Program Assets, Liabilities, Benefit Payments, and Premiums by Fiscal Year under Stress Test ^a	36
Figure A-1 Arithmetic Means, Standard Deviations, and Correlations of Key Financial Market Values.....	57
Figure A-2 Arithmetic Means and Standard Deviations of Market Rates Derived from Projected Long-Term Treasury Yields	57
Figure A-3 FY 2021 Model Projected Plan Returns	58
Figure A-4 Projected Annual Bankruptcy Probabilities	58
Figure A-5 Annual Rate of Plans’ Projected Insolvency	58

FREQUENTLY USED ABBREVIATIONS

ARP	American Rescue Plan Act of 2021
ERISA	Employee Retirement Income Security Act of 1974, as amended
FY	Fiscal Year
IJA	Infrastructure Investment and Jobs Act of 2021
ME	Multiemployer
MP-2020	Mortality Projection – 2020 Mortality Improvement Scale
MPRA	Multiemployer Pension Reform Act of 2014
PBGC	Pension Benefit Guaranty Corporation
PIMS	Pension Insurance Modeling System
RP-2014	Retirement Plans – 2014 Mortality Table
SE	Single-Employer
SFA	Special Financial Assistance
VBL	Vested Benefit Liability

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 also offer different benefit guarantees and feature different funding mechanisms. This report primarily includes 10-year projections, ending with FY 2031 (September 30, 2031), of the financial status of both programs under a range of future financial scenarios, plus additional projections beyond 10 years for the Multiemployer Program.

The projections for this year's report show that PBGC's Multiemployer Program is likely to remain solvent to a point more than 40 years out. This is an improvement over last year's report, in which half of projected scenarios resulted in insolvency by the end of FY 2055. However, both reports show a high degree of uncertainty, with the most pessimistic downside scenarios continuing to show a risk of insolvency in the mid-2030s. The extension of the Multiemployer Program's median solvency relative to last year's report is due primarily to two factors: favorable asset returns in 2021, and changes made in PBGC's final rule for Special Financial Assistance (SFA) published on July 8, 2022. The changes from the July 2021 interim final rule to the final rule improve the likelihood that plans receiving SFA will be able to pay all benefits due through plan year 2051, thus reducing, but not eliminating in all scenarios, the risk that SFA plans will become insolvent in the 2030s and 2040s.

The projected FY 2031 net financial position of the Multiemployer Program is positive in 65% of model scenarios, with a median value of positive \$4.1 billion but a mean net position of negative \$5.1 billion. The Single-Employer Program is nearly certain to remain in a positive net financial position over the next decade.

Figure 1 summarizes the main results of this report:

Figure 1 – PBGC Projected Mean Net Financial Position at the End of FY 2031 Present Value at the end of FY 2021 (\$ in billions)		
	Multiemployer Program	Single-Employer Program
Mean	(\$5.1) ^a	\$53.3 ^b
Median	\$4.1	\$52.1
15 th to 85 th Percentile	(\$18.5) - \$4.6	\$36.7 - \$69.1

a) (\$5.1) billion projected mean net financial position consists of \$5.6 billion in assets and \$10.7 billion in liabilities. While the mean of all scenarios shows a negative net position for FY 2031, the majority of scenarios project a positive net position for FY 2031.

b) \$53.3 billion projected mean net financial position consists of \$105.6 billion in assets and \$52.3 billion in liabilities.

MULTIEMPLOYER PROGRAM

American Rescue Plan Act of 2021 (ARP)

The SFA Program was enacted on March 11, 2021, as part of the American Rescue Plan Act of 2021 (ARP). The SFA Program provides funding to severely underfunded multiemployer pension plans and will enable the plans to pay benefits, without reduction, for many years into the future. Prior to the enactment of ARP, PBGC's Multiemployer Program was expected to run out of money by 2026. Instead, the SFA Program will likely keep PBGC's Multiemployer Program solvent for 40 years.

ARP enables eligible multiemployer plans to apply to PBGC for SFA. Eligibility is limited to financially troubled plans based on specific criteria set by statute. The SFA is calculated to be the amount required for the plan to pay benefits due through the end of the last plan year ending in 2051, generally based on assumptions directed by statute and PBGC regulations. The SFA Program is funded by an appropriation of Treasury general revenues. Upon approval, PBGC pays SFA to each eligible plan, which is not subject to repayment. PBGC estimates a mean total of \$82.7 billion in SFA will be distributed to 197 plans.¹ Several factors could impact the number of plans that ultimately meet the eligibility criteria for SFA, and the amount of SFA determined in plan applications. PBGC's stochastic estimates range from 140 plans receiving a total of \$66.2 billion in SFA at the first percentile to 234 plans receiving a total of \$100.4 billion at the 99th percentile. The mean total SFA decreased by \$14.5 billion from the amount estimated in last year's report, primarily due to favorable 2021 market returns and updated plan data.

On July 8, 2022, PBGC published a final rule in the Federal Register implementing changes to the SFA Program. The final rule made changes to certain provisions of PBGC's interim final rule published in July 2021, including changes in SFA calculation procedures that result in higher SFA amounts for most plans as well as an allowance for up to 33% of SFA assets to be invested in return seeking assets. The combined impact of these updated provisions increases the total estimated SFA amount by an average of \$5.6 billion.

Projected Net Financial Position (Assets vs. Liabilities)

The Multiemployer Program projections, displayed as present values as of September 30, 2021, show a decline in the mean net financial position (i.e., the average of all the scenarios modeled) of \$5.6 billion – from positive \$0.5 billion (the actual reported and audited net position on September 30, 2021) to a projected negative \$5.1 billion on September 30, 2031 (on a present value basis as of September 30, 2021).

The projected decline in the mean net position is due primarily to potential new claims between September 30, 2031, and September 30, 2041.² PBGC's Multiemployer Program generally provides 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, 2031, includes claims for plans expected to become insolvent by September 30, 2041. The SFA Program is likely to prevent currently ongoing, solvent plans from becoming insolvent prior to

¹ Under ARP, plans have until December 31, 2025 to file an initial application and until December 31, 2026, for a revised application. Plan eligibility is determined based on statutory criteria for plan status at enactment and during plan years 2020 through 2022.

² New claims are the present value of future financial assistance at the time plan insolvency becomes probable by FY 2031; this includes claims from both plans that receive SFA and do not receive SFA.

September 30, 2031, so the liability for future claims reported in the net position as of September 30, 2021, is small. However, in adverse scenarios, some currently ongoing, solvent plans may become insolvent prior to September 30, 2041, which would increase expected claims and decrease the projected net position as of September 30, 2031.

Projected Solvency (Ability to Pay Full Guaranteed Benefits)

The PBGC Multiemployer Program is expected to stay solvent during the 10-year projection period ending September 30, 2031, largely due to the SFA Program. Under most projection scenarios, the SFA provided to eligible plans delays the insolvency of PBGC's Multiemployer Program to more than 40 years in the future. The most pessimistic of the 500 scenarios projects the Multiemployer Program to go insolvent in FY 2036, while optimistic scenarios project it to remain solvent indefinitely. Fifty-three percent of scenarios result in solvency that will extend past FY 2061. This high degree of 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 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 the following differences: a separate projection of segregated SFA versus non-SFA assets, new plan data, an updated assumption for plan asset allocations, updated demographic assumptions, and updated economic assumptions. These changes are quantified and detailed in the **Multiemployer Reconciliation from FY 2020 to FY 2021**, including **Figure 10**, with additional details about changes 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 \$30.9 billion, the actual reported net financial position as of September 30, 2021, to an estimated mean of \$53.3 billion on September 30, 2031 (on a present value basis as of September 30, 2021). The Single-Employer Program's net position increased by \$15.5 billion in FY 2021, which exceeded the mean projection in the FY 2020 Projections Report due to strong realized returns on PBGC assets during FY 2021. Thus, the net position starting point of the projection period is higher for this report than what it was projected to be in the FY 2020 report.

As the net position of the Single-Employer Program continues to improve, the potential for a return to a negative net position is reduced, even under scenarios with very high projected claims. Still, existing underfunding is more acute in plans sponsored by companies with the highest risk of financial distress, and any downturn in the economy increases both underfunding and the probability of claims to PBGC. Plans sponsored by employers with below-investment-grade credit ratings had an aggregate underfunding of \$105 billion, when measured using plan termination assumptions, as of December 31, 2020, per PBGC's FY 2021 Annual Report, down from \$176 billion as of December 31, 2019, reported in PBGC's FY 2020 Annual

Report. In addition, the estimated total underfunding of PBGC-insured single-employer plans is \$560 billion, based on liabilities reported in 2018 Form 5500 filings adjusted to estimate the cost to purchase annuities.³

This year's report includes additional stochastic modeling to show an illustrative stress testing scenario in which a significant market downturn is coupled with a level of claims that approximates the highest claims experienced in the Single-Employer Program. Under this hypothetical negative event, PBGC projects a negative net position in the early years of the projection and a gradual recovery to a positive net position.

Methods and Assumptions

The single-employer model is substantially the same as the one used last year, updated to reflect new plan data and economic assumptions. These changes are described in the discussion in **Figure 16**, with additional details about changes 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 (adequacy of assets and income to meet cash needs) and balance sheet net financial position (assets minus liabilities) for the two programs under a variety of simulated future conditions. Net financial position is determined on a present value basis. In this report, a negative net position does not imply a projected insolvency.

The report generally uses assumptions and available data as of September 30, 2021, though economic data was updated through December 31, 2021.⁴ The projections start with PBGC's FY 2021 Annual Report and forecast results under a range of future economic scenarios, without presuming any changes in current law.⁵ The projections reflect current law, including the effects of ARP and the Infrastructure Investment and Jobs Act (IIJA).

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 project SFA outlays on an annual basis. The timing of PBGC payments of SFA to eligible plans depends on the timing of plans' SFA applications and PBGC approvals. Furthermore, most of this report's analysis of the Multiemployer Program excludes the flow of SFA funds through PBGC because (1) SFA payments are fully funded by appropriations and not from PBGC insurance funds, and (2) by law, PBGC will make no further SFA distributions after FY 2030 and the SFA Program will thus be effectively closed out by the end of the projections period.

³ Total plan underfunding from Table S-44 of PBGC's [2019 Data Tables](#).

⁴ The use of economic data as of December 31 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 1.

⁵ The financial statements in the FY 2021 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, 2021 (the end of FY 2021).

PBGC uses two stochastic modeling systems 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. 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 for SFA provided by ARP.

In addition, many aspects of the individual plans and the complex rules that govern the private employer 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% of the outcomes are higher [more favorable]), the median value (50th percentile), and the 15th percentile (15% of outcomes are lower [less favorable]) are shown. During a 10-year or longer period, it is likely that results will at times fall outside this 15th – 85th percentile range. The 1st and 99th percentile results are also shown in figures to provide a sense of the broad range of potential outcomes.

Financial Obligations

The report presents two types of financial measures:

- Liabilities, which represent the present value of the guaranteed retirement benefits that will be 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, which represent the benefit payments expected to be disbursed by PBGC during each year of the projection period. Cash flows provide the basis for examining PBGC solvency.

Claims are newly recorded liabilities reduced by any associated plan assets and cash recoveries from plan sponsors for a plan that PBGC takes over.⁶ Claims are recorded when the payment of guaranteed amounts is

⁶ Asset recoveries are only made in single-employer claims events and are not applicable for the Multiemployer Program.

deemed “probable”.⁷ Claims occur only when a plan does not have enough assets to pay promised 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 mature.

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).⁸
- 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 under different economic scenarios. They do not model possible future losses, disclosed in the notes to PBGC’s financial statements, not booked as liabilities, such as amounts that represent “reasonably possible” contingencies.⁹

“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.

About the PIMS Models

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

The FY 2021 SE-PIMS model reflects the minimum funding relief provisions of ARP that affect single-employer plans, the interest rate corridor extensions of the IIJA, and the impact of expected future standard plan terminations. It remains predominantly the same as the FY 2020 model. For FY 2021, the ME-PIMS model was updated to reflect the SFA provisions of ARP based on PBGC’s final rule, the separate projection

⁷ Based on the definition under ASC 450 “Contingencies.”

⁸ 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.

⁹ Reasonably possible contingencies are discussed in Note 9 of PBGC’s FY 2021 Annual Report. Measured as of December 31, 2020, they were \$105 billion for the Single-Employer Program and \$329 million for the Multiemployer Program.

of segregated SFA versus non-SFA assets, and an updated assumption for plan asset allocations.¹⁰ Both models were updated with new plan data from plans' Forms 5500 and assumptions regarding the underlying economy.

While both ME-PIMS and SE-PIMS can 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

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 benefit. This evaluation assumes no changes to the current law after September 30, 2021, for both multiemployer plans and single-employer plans.¹²

¹⁰ This report is based on provisions in the final rule published in the Federal Register on July 8, 2022, which took into account public comments regarding the interim final rule. The final rule can be found here: <https://www.govinfo.gov/content/pkg/FR-2022-07-08/pdf/2022-14349.pdf>.

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>.

¹² Other than the publication of the SFA final rule on July 8, 2022.

MULTIEMPLOYER PROGRAM

MULTIEMPLOYER PROGRAM OVERVIEW

Multiemployer pension plans are collectively bargained plans maintained pursuant to one or more collective bargaining agreements between at least one labor union and more than one employer that are generally in the same industry or members of a trade association. PBGC's Multiemployer Program covers approximately 10.9 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 regular financial assistance directly to the plan to cover participants' guaranteed benefits and plan administrative expenses. This financial help 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' premium rates are lower than those for single-employer plans and are based solely on participant count. The amount and structure of the benefit guarantees provided under each program also differ significantly, and the guaranteed 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.

The solvency of a multiemployer plan receiving SFA in accordance with ARP will ultimately depend on the plan's experience after receiving SFA. Plan experience prior to applying for SFA generally will lead to a dollar-for-dollar increase or decrease in the amount of SFA, so that pre-application experience has a minimal impact on plans' projected solvency. The final rule includes changes from the interim final rule that better align the interest rate assumptions used to determine SFA with the investment restrictions on plans that receive SFA. The final rule also modifies the SFA calculation procedures for plans that implemented a benefit suspension under MPRA. These changes increase the estimated total SFA payable to eligible plans and better enable plans to project that they will be able to pay benefits through 2051, which results in a modest improvement in the Multiemployer Program's solvency outlook.

Multiemployer plans not receiving SFA may be "booked" as new claims on the Multiemployer Program if they are projected to run out of money by FY 2041 (the final year for a plan to be booked as a probable loss by FY 2031). Due to the favorable investment returns during 2021, the projected solvency outlook for these plans has improved, therefore resulting in a corresponding improvement in the Multiemployer Program's solvency outlook.

Figure 2 summarizes the improvement in the projected FY 2031 financial condition of the Multiemployer Program from FY 2020 to FY 2021, primarily due to the changes in the final rule and favorable investment performance during 2021.

Figure 2 – Projected Change in Key Financial Results (\$ in billions)		
	FY 2020 Projections	FY 2021 Projections
Expected FY 2031 Mean Net Financial Position – present value at the end of FY 2021	(\$9.8) ^a	(\$5.1)
Median Projected Year of PBGC Insolvency	FY 2055	After 2061 ^b
Mean Projected SFA	\$97.2	\$82.7 ^c

a) The expected FY 2031 mean net financial position based on the FY 2020 projections calculated in the ME-PIMS model (used in the FY 2020 Projections Report), with the FY 2030 mean net financial position adjusted to reflect the passage of time. This is shown in **Figure 10** of this report.

b) The median projected year of PBGC insolvency based on FY2021 projections is outside ME-PIMS model’s 40-year projection period.

c) The \$82.7 billion mean projected SFA includes approximately \$385 million in financial assistance loan repayments and approximately \$768 million in make-up payments for previously suspended benefits. The \$385 million in financial assistance loan repayments are not included in the \$82.3 billion estimated SFA in the final rule published on July 8, 2022.

AMERICAN RESCUE PLAN ACT OF 2021

ARP established section 4262 of ERISA under which SFA is provided to eligible multiemployer plans.^{13, 14} 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. 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 reinstatement of suspended benefits for all participants as of the effective date of the SFA. For eligible insolvent plans, the SFA also includes the amount needed to repay the loan from PBGC for the regular 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 regular 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.

¹³ 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.

¹⁴ Eligibility for SFA is limited by law to certain financially distressed multiemployer plans, refer to ERISA section 4262(b) for more information.

Last year's report estimated the total cost of SFA based on PBGC's interim final rule published in the Federal Register on July 12, 2021. This year's report estimates the total cost of SFA based on the final rule published on July 8, 2022. Among the changes in the final rule's provisions are three changes that materially impact the estimated total amount of SFA and the solvency of the Multiemployer Program. These changes were reflected in the updated ME-PIMS model and are described as follows:

- 1) Modification of the SFA calculation method to use two separate interest rates to project future investment returns for plans' SFA assets and non-SFA assets; and alignment of the SFA interest rate with reasonable expectations of investment returns on plans' SFA assets. The final rule retains use of plans' pre-2021 zone status interest rate assumption, but the statutory interest rate limit applies only to plans' non-SFA plan assets. The interest rate limit for SFA assets reflects changes made to SFA investment restrictions in the final rule, described below. The new interest rate limit for SFA assets is the average of the 3 segment rates used under the statutory pension funding rules for single-employer plans, plus 67 basis points.
- 2) Allowance of up to 33% of a plan's SFA funds to be invested in certain return-seeking assets.
- 3) A separate SFA calculation methodology applicable for MPRA plans under which the SFA amount is the greatest of (a) the SFA determined under the calculation methodology for non-MPRA plans; (b) the least SFA required such that the plan will project rising assets at the end of the 2051 plan year; and (c) the SFA equal to the present value of reinstated benefits (accounting for both make-up payments and reinstated benefits through 2051).

The estimated impact of these updated final rule provisions is an increase of \$5.6 billion in the mean total SFA. However, there is an overall decrease in the estimated total SFA of \$14.5 billion, from \$97.2 billion modeled in last year's report to the current \$82.7 billion estimate. Other factors, primarily the updates made to plan and economic data, result in significant decreases in the new estimate of the total SFA. The overall cost of the SFA Program is uncertain because the amount of SFA each plan will receive is calculated at the time the plan applies to PBGC, and that SFA calculation is based on plan projections and economic conditions at the time of application. **Figure 3** provides a detailed reconciliation of the changes from FY 2020 to FY 2021 in the estimate of total SFA payable to eligible multiemployer plans.

Figure 3 – Reconciliation of Changes in Total SFA Estimate Nominal Cost of SFA Payable to Eligible Multiemployer Plans (\$ in billions)	
1. Mean Total SFA from FY 2020 Projections Report	\$97.2
2. Changes	
a) New Plan Data	(11.1)
b) New Economic Data	(12.7)
c) Model Improvements	(0.4)
d) Other Assumption Changes	4.1
e) Total Changes [(2a)+(2b)+(2c)+(2d)]	<u>(\$20.1)</u>
3. Mean Total SFA Prior to Reflection of Final Rule of ARP [(1) + (2e)]	\$77.1
4. Impact Due to Changes in the Final Rule of ARP	<u>\$5.6</u>
5. Mean Total SFA [(3) + (4)]	\$82.7

Explanations of the changes in the total SFA shown in **Figure 3** are:

- *New Plan Data* – The FY 2021 ME-PIMS model reflects new plan data available from 2019 Form 5500 filings. This includes higher-than-expected investment returns during plan year 2018 and changes in participant data and contributions. Use of the updated data reduced the number of plans expected to become eligible for SFA and decreased the mean total SFA by \$11.1 billion.
- *New Economic Data* – The determination of SFA is highly sensitive to existing plan asset values as of the SFA measurement date. Due to favorable equity returns from December 31, 2020, through December 31, 2021,¹⁵ plans are projected to have a higher level of plan assets as of year-end 2021 compared to last year’s projections. This decreased the amount of SFA required for plans to pay all benefits and expenses through 2051 and the mean total SFA decreased by \$12.7 billion.¹⁶
- *Model Improvements* – Various minor programming refinements were made to the ME-PIMS model in conjunction with this report. The combined effect of these updates decreased the mean total SFA by \$0.4 billion.
- *Other Assumption Changes* – Various assumption changes were reflected in the ME-PIMS model that impacted SFA estimates. These modifications include updates to (1) the asset allocations and return assumptions for multiemployer plans, (2) active population decline assumptions, (3) projected administrative expenses, and (4) the base mortality table for determining plan cash flows. Reflecting these changes increased the mean total SFA by \$4.1 billion.

¹⁵ The S&P 500 index returned 28.7% during calendar year 2021.

¹⁶ Updates to economic data are made in ME-PIMS as of December 31 each year. Because individual SFA amounts are highly sensitive to plan asset returns, this measurement date has a significant impact on the estimate of total SFA. Losses incurred in the equity markets in early 2022 may impact future SFA estimates.

ME-PIMS models plan eligibility and estimates SFA amounts under 500 stochastic scenarios.¹⁷ Although certain plans are already known to be eligible for SFA based on existing plan certifications for the 2020 and 2021 plan year, more plans could become eligible in the 2022 plan year.¹⁸ The level of plan asset investment returns or changes to plan demographics may make additional plans eligible. Changes in these same factors may significantly impact the amount of SFA that is ultimately paid to eligible plans. The wide range of possible outcomes shown in **Figure 4** reflects the sensitivity in estimates to changes in plan investment returns and plan demographic changes.

Figure 4 – Stochastic Range of Projected SFA Distributions		
	Estimated Number of Plans ^a	Estimated Total SFA (\$ billions)
99 th Percentile	234	\$100.4
85 th Percentile	224	\$91.2
Mean	197	\$82.7
50 th Percentile (Median)	200	\$81.9
15 th Percentile	167	\$74.7
1 st Percentile	140	\$66.2

a) The estimated number of plans excludes plans that may be eligible for SFA but do not require additional funds to be able to pay all benefits and expenses through 2051.

The range of outcomes has decreased significantly from last year’s projection, which reported a range from \$66.1 billion to \$147.4 billion payable to between 158 and 482 plans. The primary cause of the smaller range in this year’s report is the passage of time and the recognition of evolving experience. The final year for plans to determine eligibility for SFA is plan year 2022, and all initial SFA applications must be submitted by December 31, 2025. As the valuation date of PBGC’s annual Projections Report approaches the end of the SFA eligibility and application periods, variability in projected outcomes will be reduced significantly.

PBGC’s interim final rule established, and the final rule maintained, priority status for several subsets of eligible plans to apply for SFA within the first two years following the enactment of ARP. All other eligible plans generally may apply after March 11, 2023. In addition to uncertainty regarding the number of plans that may become eligible for SFA, it is uncertain if and when each eligible plan will apply for SFA. For purposes of conducting SFA projections, ME-PIMS assumes that all eligible plans will apply for and receive SFA, except for eligible plans that do not require assistance to pay all benefits due through 2051.

In addition to extending the projected solvency of PBGC’s Multiemployer Program, ARP improves benefit security for participants of multiemployer plans expected to be eligible for SFA. Even assuming the

¹⁷ SFA amounts for each eligible plan are estimated stochastically with the exception of the largest plan that has applied for SFA, the Central States, Southeast & Southwest Areas Pension Plan (“Central States”). For the Central States plan, information from the April 28, 2022, SFA application under the interim final rule was used as the basis to estimate a fixed SFA amount under the final rule provisions in each of the 500 model scenarios. In its application under the interim final rule, the plan requested \$35.1 billion.

¹⁸ The plan data in ME-PIMS for this report is primarily based on 2019 Form 5500 filings, and eligibility for SFA is projected for each individual plan through 2022 based on model assumptions. Data pertaining to a plan’s certified zone status was obtained from publicly available zone status notices, as available by November 29, 2021.

Multiemployer Program would be solvent indefinitely, had these financially troubled plans failed without SFA or some other source of support, millions of participants would have been subject to benefit reductions to the PBGC guarantee level. For many plans, the PBGC multiemployer guaranteed benefit level is significantly lower than the plan benefit level. For plans that enacted benefit suspensions under MPRA, participants would have continued to be subject to those benefit reductions. The SFA provided under ARP enables plans to pay millions of participants the unreduced level of their benefit promises for many years to come.

MULTIEMPLOYER PROGRAM SOLVENCY

As noted in last year's report, ARP will delay and may potentially avert the insolvency of PBGC's Multiemployer Program. While last year's report projected that half of all scenarios resulted in the insolvency of the Multiemployer Program during or before FY 2055, 54% of scenarios in the new projection result in the Multiemployer Program remaining solvent at least through 2061 – the end of the ME-PIMS 40-year projection period. However, if future plan experience is unfavorable relative to the assumptions used to determine the amount of SFA, 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 5 compares PBGC's Multiemployer Program assets as of the beginning of each fiscal year to the projected premium income and projected average financial assistance payments for each fiscal year.¹⁹ The mean projected annual premium income exceeds the mean projected annual financial assistance payments each year until FY 2040, after which the mean value of PBGC's projected multiemployer fund balance begins to decrease sharply as plans begin to go insolvent and start drawing regular financial assistance from PBGC's Multiemployer Program. Between one-quarter to one-half of this mean annual projected financial assistance is expected to be provided to plans that previously received SFA. The mean projected asset balance is shown in green and the bars illustrating the mean annual financial assistance payments include both favorable scenarios under which plans remain solvent and adverse scenarios under which plans begin receiving financial assistance earlier than expected.

As illustrated in **Figure 5**, there is a wide range in the projected estimates of the solvency of the Multiemployer Program. The mean asset value drops to zero in FY 2055, which is a 6-year improvement over last year's mean projection of FY 2049. Whereas last year's median projection resulted in the depletion of the Multiemployer Program's assets in FY 2055, this year's median projection results in the Multiemployer Program remaining solvent beyond FY 2061, the end of the 40-year projection period. The higher financial assistance payments in the adverse projection scenarios have a larger influence on the mean result because they are large enough to deplete the modest level of PBGC reserve assets, even when averaged with the

¹⁹ Assets are shown as of a point in time – the beginning 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. Treasury funding for SFA is not included in **Figure 5** asset amounts because, by law, it is distributed by PBGC's newly created eighth fund.

smaller financial assistance payments from the favorable projection scenarios. Under the median projection, the acceleration of PBGC financial assistance payments generally begins at a later point than under the mean results.

The primary drivers of the improvement in the projected solvency of the Multiemployer Program are improved plan funding levels for non-SFA plans as well as certain changes made in PBGC’s final rule. The expansion of permissible SFA investments coupled with increases to SFA payments resulting from the use of a separate SFA interest rate improves the likelihood for plans to remain solvent through plan year 2051 and beyond.

Figure 5 – PBGC Multiemployer Fund Assets, Regular Financial Assistance Payments, and Premiums by Fiscal Year

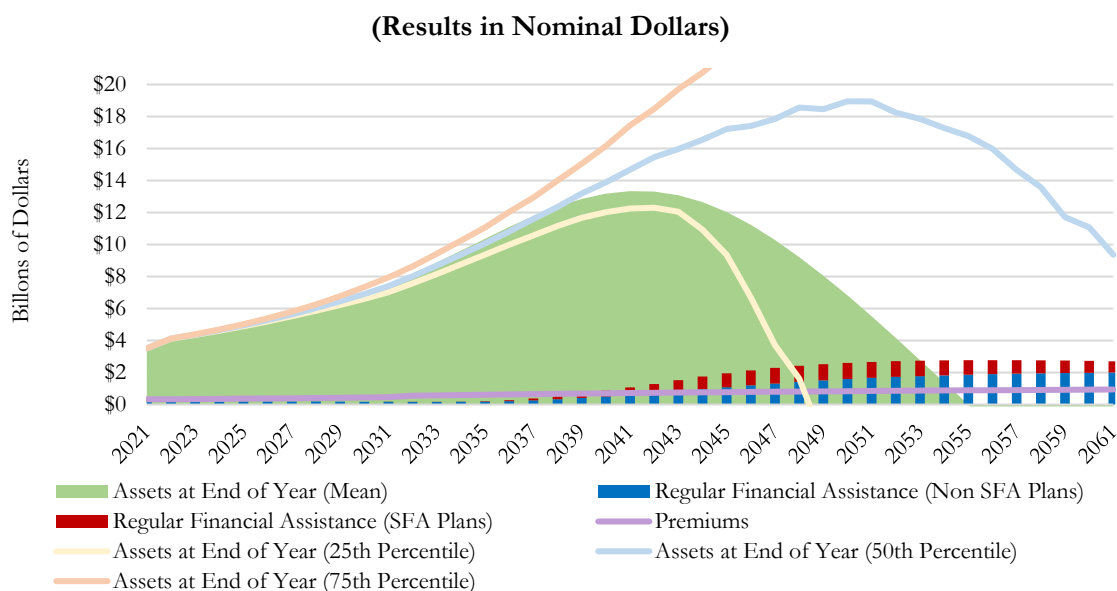
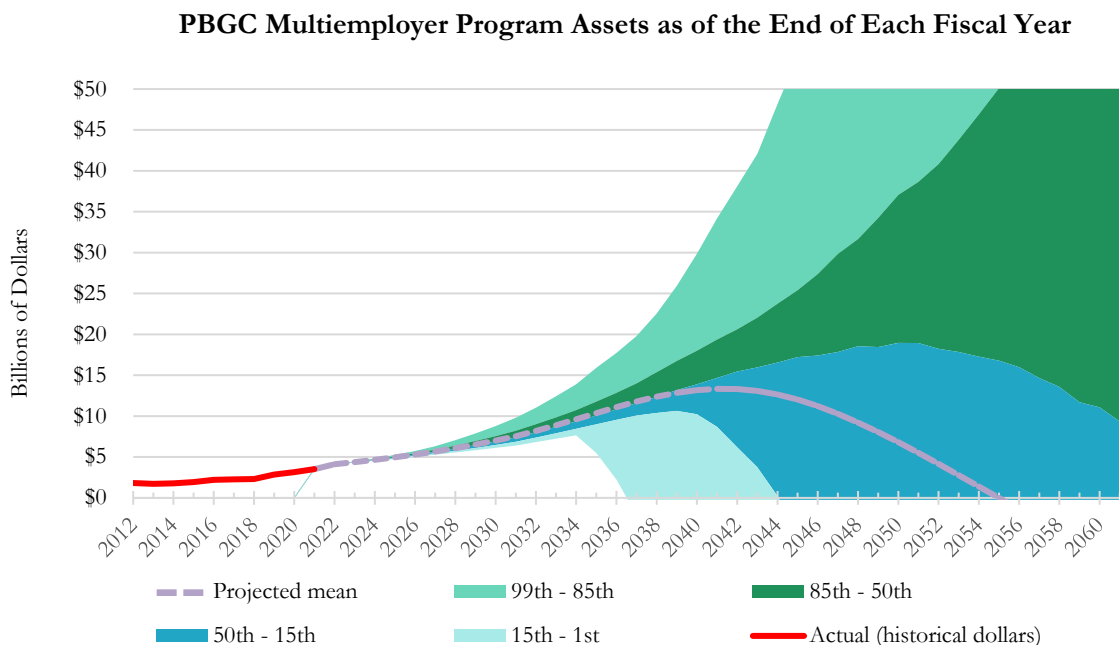


Figure 5 shows PBGC’s multiemployer fund balance at three levels of certainty. Under the 25th percentile results, PBGC’s multiemployer fund balance is projected to be depleted in FY 2049. Under the 50th and 75th percentile results, PBGC’s multiemployer fund balance is projected to remain solvent beyond FY 2061. **Figure 5** also shows that while the projected annual regular financial assistance payments are similar to those shown in last year’s report, the majority of these payments are now expected to be paid to plans that are not projected to receive SFA. By contrast, last year’s report projected more than half of future regular financial assistance to be paid to plans that are projected to receive SFA. This shift is due to the improved funding position for plans that enjoyed better-than-expected asset returns in 2021. Many of these plans were previously projected to receive SFA in last year’s report, but after incorporating updated plan and economic data are no longer projected to meet SFA eligibility requirements, or if eligible, no longer require SFA to pay plan benefits and expenses through 2051. These plans, however, like plans that do not receive SFA, are still vulnerable to certain future scenarios with poor asset returns and could require financial assistance from PBGC prior to 2051.

The projected solvency of the Multiemployer Program over this extended period is highly uncertain and subject to variable outcomes. The median solvency projection period for Multiemployer Program assets is over 40 years and is subject to a wide range of adverse or favorable experience over that long period of time. Figure 6 illustrates the wide distribution and variability of these outcomes.²⁰

**Figure 6 – Projected Assets of PBGC Multiemployer Program
(Mean and Percentile Scenarios)**



At the 1st percentile, Multiemployer Program assets are depleted during FY 2037, the same year as projected in last year’s report.²¹ Under these scenarios, financial markets incur significant losses in the years closely following the payments of SFA to eligible plans. In these adverse scenarios, asset returns underperform compared to the deterministic projections included in the SFA applications, resulting in plan insolvency much earlier than 2051. Because these unfavorable scenarios are characterized by heavy investment losses *after* receipt of SFA, and no plans had received SFA as of September 30, 2021, the worst-case scenarios in this report are similar to last year’s report (even though the mean and median projections have improved).

In most scenarios, the Multiemployer Program remains solvent beyond FY 2061. Under these scenarios, financial markets generally avoid unfavorable investment returns in the years closely following the payments of SFA to eligible plans, allowing these plans to remain solvent past 2051. These scenarios generally include periods of higher premium revenues, which are indexed to wage growth, and low claims.²²

Although investment returns play a significant role in driving the wide range of stochastic outcomes, additional factors contribute to the overall uncertainty. One such key factor is the level of future employer

²⁰ PBGC assets shown in Figure 5 and Figure 6 exclude the SFA Program funds, given their pass-through structure.

²¹ Under the most adverse scenario out of 500 scenarios, PBGC is projected to run out of money during FY 2036.

²² ME-PIMS does not assume that plans implement any benefit increases for past service.

contributions to ongoing plans, which is driven by both future increases to contribution rates and changes in the units of work that form the basis of contributions, (e.g., hours or shifts of work performed). Additionally, 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 a moderate improvement in the Multiemployer Program's net financial position at the end of the projection period, from negative \$6.7 billion at the end of FY 2030 in last year's report to negative \$5.1 billion at the end of FY 2031 in this year's report.

Last year's report projected that the mean net position would gradually decline from an estimated \$43 million as of September 30, 2021, to negative \$6.7 billion at the end of FY 2030. The Multiemployer Program's actual FY 2021 net position improved to positive \$481 million as of September 30, 2021, primarily due to the "unbooking" of liabilities for plans expected to apply for and receive SFA. This year's projection also shows a gradual decline in the mean net position over the next 10 years to negative \$5.1 billion.

Figure 7 shows the actual net position for the Multiemployer Program for FY 2012 through FY 2021, and selected ranges of projected net positions for the following 10 years. Although the mean projected net position as of FY 2031 is negative, most projection scenarios show a modest positive net position. The mean net position is \$9 billion lower than the median. This occurs because the range of projected outcomes is unevenly distributed, with the magnitude of potential deficits in the most adverse scenarios significantly greater than the magnitude of potential positive net positions in the most favorable scenarios. Under highly adverse scenarios, severe market losses are experienced broadly by multiemployer plans which accelerate potential insolvencies for plans that receive SFA as well as for plans that do not receive SFA. Such market losses suffered by all plans lead to a high level of new PBGC claims that combine to produce a substantial negative net position. The potential for financial upside is much more limited. In highly favorable scenarios, PBGC is generally not expected to incur any new claims by the end of FY 2031. However, improvements in the Multiemployer Program's net position are constrained by the low level of premiums paid by multiemployer plans, even taking into account the modest ARP premium increases that take effect after December 31, 2030.

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 7 – Multiemployer Program Projected Net Financial Position
(Mean and Percentile Scenarios)**

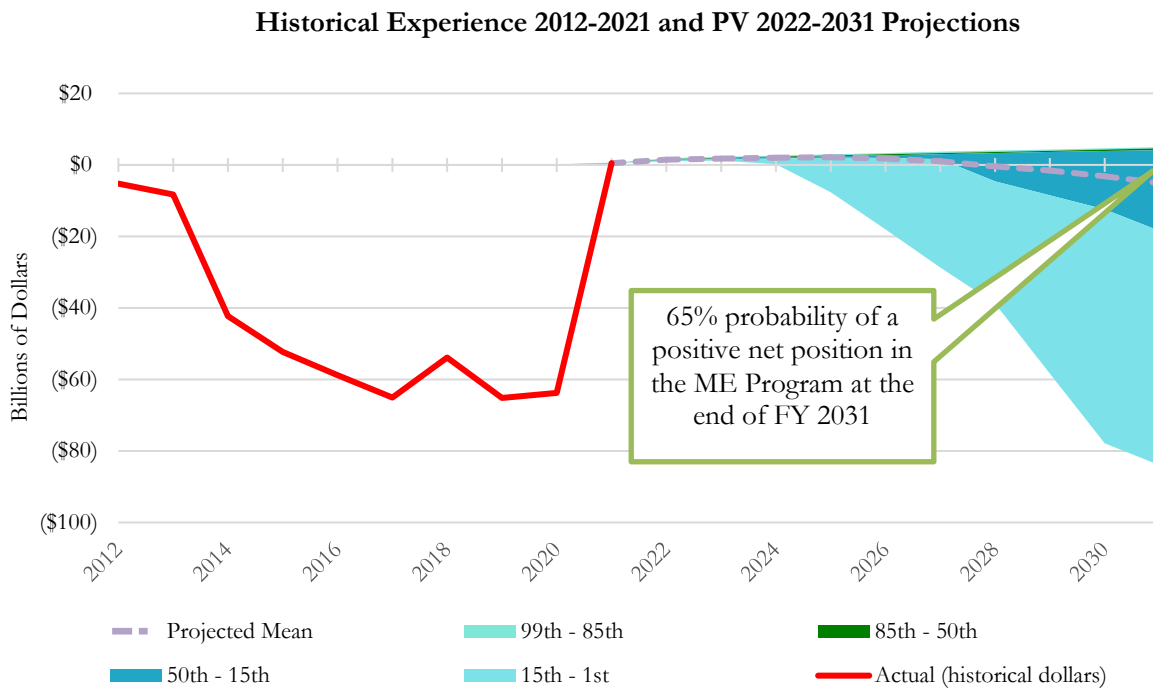
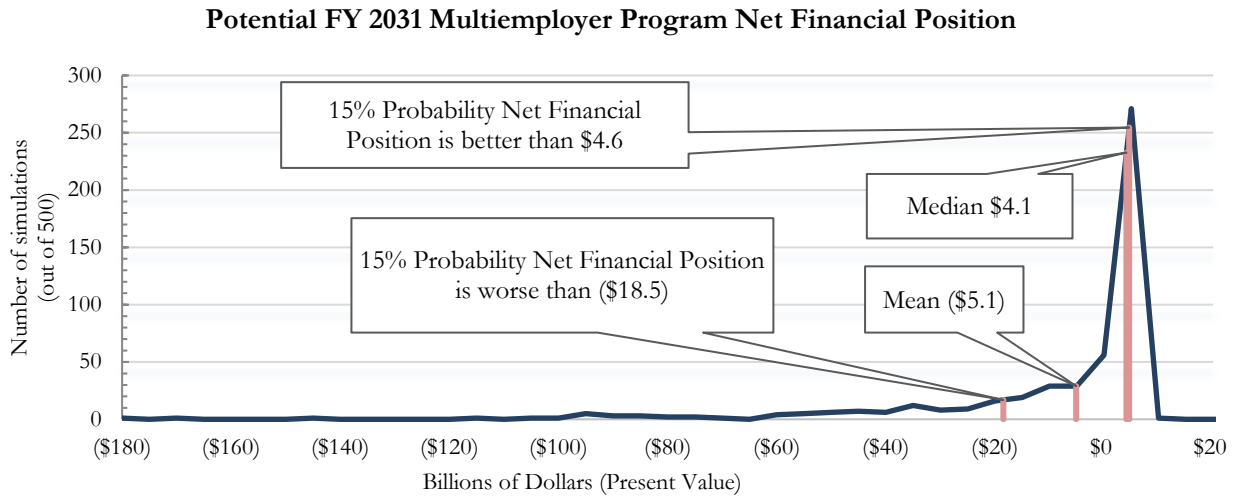


Figure 8 below shows the full range of projected outcomes for the net position of the Multiemployer Program in FY 2031. This includes the scenarios that fall below the 1st percentile and above the 99th percentile. For each value of PBGC’s projected net position along the horizontal axis, the height of the line shows the frequency of that net position.

A significant majority of scenarios reflect only a modest positive or negative net position by the end of FY 2031. 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 7** under the 1st to 15th percentile results. These adverse outcomes in the left tail have a low probability before FY 2031, but large negative net positions would become more likely if the projection were extended beyond FY 2031 (as the projection year approaches 2051).²³

²³ 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 8 – Potential FY 2031 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 the SFA will substantially bolster the financial position of eligible plans, over the long-term future developments in many of the industries that sponsor these plans may limit the sustainability of troubled plans, 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 economic and demographic uncertainty in the projections of the Multiemployer Program. Post-ARP, there are four major sources of uncertainty in the multiemployer system:

- Number of plans that become eligible for and receive SFA.
- SFA amounts determined for eligible plans.
- Changes in the financial position and demographics of plans following receipt of SFA.
- Changes in the financial position and demographics of plans that do not receive SFA.

Each of these four factors has a direct impact on the expected claims to be incurred by PBGC in the next 10 years. The number of plans and the amounts of SFA will be impacted by plan sponsor decisions and therefore present a challenge to model. Although most of PBGC’s previous multiemployer claims were “unbooked” as of September 30, 2021, due to expected receipt of SFA, the extent to which adverse experience may subsequently cause plans to again become probable losses by the end of FY 2031 is uncertain. **Figure 9** summarizes the range of the Multiemployer Program’s net position.

Figure 9 – Variability in FY 2031 Multiemployer Net Financial Position			
Present Value at the end of FY 2021 (\$ in billions)			
	Mean	15 th – 85 th Percentile Range	1 st – 99 th Percentile Range
PBGC Net Financial Position			
1. FY 2021 Actual	\$0.5	\$0.5	\$0.5
2. FY 2031 Projected	(\$5.1) ^a	(\$18.5) - \$4.6	(\$84.0) - \$5.0
Present Value of Financial Activity Expected During FY 2022-2031			
3. New Claims ^b	(\$10.2)	(\$22.5) – (\$0.1)	(\$77.0) – (\$0.0)
4. Premiums Received ^c	\$3.8	\$3.8 - \$3.9	\$3.7 - \$4.0
5. Asset/Liability Gain/(Loss)	\$0.8	\$0.5 - \$1.7	(\$2.6) - \$9.2
6. Regular (non-SFA) Financial Assistance Payments	\$1.4	\$1.3 - \$1.5	\$1.2 - \$1.6

a) If expressed in nominal terms, the mean projected net financial position for FY 2031 is negative \$6.4 billion.

b) New claims are the present value of future financial assistance at the time plan insolvency becomes probable by 2031.

Approximately 38% of new claims are projected to come from plans expected to receive SFA.

c) Premiums plus \$3.5 billion in assets as of September 30, 2021, are available to make periodic, regular financial assistance payments to insolvent plans during the projection period.

Figure 9 shows that variability in the FY 2031 net position is primarily driven by the uncertainty in future claims and to a lesser extent future PBGC asset experience. By contrast, **Figure 9** shows minimal variability in the following expected multiemployer fund cash flows during the next 10 years:

- Premium income is steady on a year-to-year basis because there is only a flat rate premium that can vary under different model scenarios by only differences in participant counts and future indexation.
- Due to expected SFA payments, all regular (non-SFA) financial assistance projected to be paid in the next 10 years is expected to be terminated plans that are not eligible for SFA, including plans that became insolvent prior to December 17, 2014, and plans that terminated prior to the enactment of ARP and become insolvent in the next 10 years.

Consistent with **Figure 7** and **Figure 8**, most scenarios project little to no new claims in the next 10 years because SFA is generally expected to forestall plan insolvencies beyond FY 2041 even in many scenarios where returns are projected to be unfavorable. However, in scenarios with very poor outcomes, many plans that were previously “unbooked” following the enactment of ARP are projected to become “rebooked” once again by FY 2031, which drives up the mean claims amount. For scenarios where plans are “rebooked” prior to FY 2031, there may be liability gains/losses incurred from plan experience in the years preceding FY 2031.

Number of Plans that Become Eligible for and Receive SFA

In addition to certain ongoing plans that are currently insolvent or were granted an approval for a benefit suspension under MPRA, the statutory eligibility provisions for SFA include criteria based on plan zone status, funded ratio, and demographics over the plan years 2020 through 2022. Based on the most recently

available Form 5500 filing information and zone status certifications, there are approximately 190 plans that appear to satisfy the SFA eligibility criteria using data only for plan years 2020 and 2021. There are nearly 50 additional plans that do not currently meet the eligibility criteria based on recently reported data but could become eligible under at least one ME-PIMS scenario by the 2022 plan year. The number of plans that ultimately become eligible depends on plan experience from 2019 to 2022, particularly related to plan investment returns, liability gains/losses, changes in valuation assumptions other than interest, and demographic changes. Some plans that meet the eligibility criteria for SFA may not require any SFA to be able to pay all benefits and expenses through 2051, and thus would not receive any SFA payment. Therefore, it is possible that the number of plans eligible for SFA exceeds the number of plans that receive SFA.

As shown in **Figure 4**, the difference in the SFA plan count between the 15th and 85th percentiles is 57 plans and expands to a difference of 94 plans between the 1st and 99th percentile results. Other than plans eligible for relatively small amounts of assistance, the number of eligible plans will impact the incidence of new PBGC claims on its insurance fund and therefore PBGC's future financial results. The SFA will improve plans' funded position and generally extend projected solvency, and the applicable conditions under §4262.16 of the final rule will likely enhance this impact.²⁴

SFA Amounts Determined for Eligible Plans

The amount of SFA for each eligible plan is also uncertain and depends on many of the same factors that will influence the number of eligible plans. The estimated amount of SFA differs for every plan and under every stochastic scenario, based on the projected asset, liability, and cash flow information estimated as of the SFA application date assumed by the model. There is significant variability in the aggregate amount of SFA projected by ME-PIMS, including a difference of approximately \$16.5 billion between the 15th and 85th percentiles and \$34.2 billion between the 1st and 99th percentile results (see **Figure 4**). Also, the amount of SFA that a plan actually receives could differ substantially from the amount estimated by ME-PIMS, for the following reasons:

- 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, particularly investment return experience, will impact the amount of SFA that is requested.
- The timing of each eligible plan's application is unknown until submitted.

The variance between SFA amounts estimated by ME-PIMS and the actual amounts that will be paid impacts both the financial projections of PBGC's SFA fund as well as the projected net position of the multiemployer guarantee fund.

²⁴ Plans that receive SFA are subject to certain conditions imposed under ERISA section 4262(m). The conditions include restrictions on benefit improvements, contribution reductions, asset allocation, and withdrawal liability. These restrictions are not explicitly modeled in ME-PIMS, but are designed to help extend the solvency of plans that receive SFA.

Changes in the Financial Position of Plans Following Receipt of SFA

Under ARP, the amount of SFA paid to eligible plans is based on the plans' deterministic projections of all plan obligations (benefit payments and plan expenses) and resources (plan assets, contributions, investment and other income). The amount of SFA is the least amount required by the plan to pay all benefits and plan expenses due through the end of the last plan year ending in 2051, using assumptions constrained by statute and PBGC's regulation. Due to the long-term nature of these projections, plans' actual experience may differ significantly from the assumptions used to calculate the SFA. SFA amounts are paid in a lump sum and are not "trued-up" in the future to account for ongoing plan experience.²⁵ Consequently, it is possible for plans to receive SFA and still become insolvent before 2051, or instead to remain solvent beyond 2051.

Investment returns are critical to a plan's future solvency, particularly for plans with a diminished contribution base and especially during the early years when the non-SFA asset balances are not being spent down. Under the final rule, at least 67% of SFA assets must be invested in investment-grade fixed income securities, with only 33% of SFA assets permitted to be invested in return-seeking assets (e.g., U.S. equities). Due to these restrictions on SFA assets, which do not apply to non-SFA assets, plans are expected to pay benefit payments and expenses out of SFA assets first, to minimize the portion of total plan assets that are subject to investment restrictions, with the goal of growing non-SFA assets at a higher rate of return. Unfavorable investment returns during these initial years will accelerate plan insolvencies. Financially troubled plans that received SFA 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 plan's solvency and thus PBGC's future net position.

Future contribution income also impacts a plan's solvency and 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.

Changes in the Financial Position of Plans that do not Receive SFA

Under ARP, eligibility for SFA is limited to the most financially distressed multiemployer plans. Other plans not eligible for SFA, particularly those in critical status and endangered status, could become insolvent under certain scenarios. As of September 30, 2021, these plans are generally not projected to become insolvent within the next 10 to 20 years. However, under adverse projection scenarios, some plans are projected to be within 10 years of insolvency by September 30, 2031, and would therefore be booked as a liability in PBGC's financial statements at that time.

The bars in **Figure 5** show that, on average, between one-half to three-quarters of annual projected financial assistance is expected to be provided to plans that do not receive SFA. Generally, the key risk factors for

²⁵ Under the final rule, plans that had an application approved based on the provisions of the interim final rule can submit a supplemented application to receive an additional SFA payment that "trues up" the first payment to the provisions of the final rule.

these plans (e.g., investment risk and potential loss of future contribution income) are similar to those for plans that receive SFA. Consequently, any correlated adverse experience (such as a financial market downturn) can lead to a significant deterioration of the PBGC multiemployer guarantee fund's financial position.

MULTIEMPLOYER RECONCILIATION OF FY 2020 PROJECTIONS TO FY 2021 PROJECTIONS

Figure 10 provides a detailed reconciliation of the changes in estimates of the Multiemployer Program's net financial position from last year's FY 2020 projections to these FY 2021 projections. ME-PIMS projections of PBGC's multiemployer obligations are slightly higher than last year's projections resulting in a mean present value of negative \$5.1 billion for FY 2031. This is an improvement in net financial position of \$1.6 billion from the previous projection of negative \$6.7 billion for FY 2030.

The 10-year projections show the Multiemployer Program's net position improved from last year's projections. This is primarily due to favorable plan investment experience and changes made in the final rule, offset by assumption changes that slightly decrease the projected net position.

Figure 10 – Reconciliation of Changes in Multiemployer Projection Results	
Present Value at the end of FY 2021 (\$ in billions)	
1. FY 2030 Mean Net Financial Position from FY 2020 Projections Report	(\$6.7)
2. Passage of Time	<u>(3.1)</u>
3. Expected FY 2031 Mean Net Financial Position [(1) + (2)]	(\$9.8)
4. Changes	
a) New Plan Data	3.5
b) New Economic Data	3.3
c) Model Improvements	(1.0)
d) Other Assumption Changes	<u>(2.9)</u>
e) Total Changes [(4a)+(4b)+(4c)+(4d)]	\$2.9
f) FY 2031 Mean Net Financial Position Prior to Reflecting Final Rule [(3) + (4e)]	(\$6.9)
5. Changes in the Final Rule	<u>1.8</u>
6. FY 2031 Mean Net Financial Position [(4f) + (5)]	(\$5.1)
7. Adjustment from Present Value to Nominal Value	<u>(1.3)</u>
8. Nominal Value of FY 2031 Mean Net Financial Position [(6) + (7)]	(\$6.4)

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

Explanations of the changes in the mean net position shown in **Figure 10** are:

- **Passage of Time** –The FY 2020 report projected PBGC’s net position in FY 2030 and presented the results valued in 2020 dollars. To compare this with the FY 2021 report, which projects to FY 2031 with values reported in 2021 dollars, the FY 2020 projections are rolled forward to project one additional year with one less year of discounting. In addition, the FY 2021 projection includes one additional year of projected new insolvencies compared to the FY 2020 projection (i.e., those in the FY 2021 projection are projected to become insolvent through FY 2041, whereas the FY 2020 projection only includes projected insolvencies through FY 2040). The effect of the roll forward from 2020 to 2021 is a reduction of \$3.1 billion in the projected net position.
- **New Plan Data** – Changes in the starting data between FY 2020 and FY 2021 reflect new plan data provided on plans’ Forms 5500. This includes higher-than-expected returns on assets during plan year 2018 and changes in participant data and contributions. Use of the updated data improves the projected net position by \$3.5 billion.
- **New Economic Data** – The different economic climate in FY 2021 compared to FY 2020 results in changes to the economic assumptions upon which all the ME-PIMS projections are based. Because equities performed well during calendar year 2021, plans are generally projected to be better funded than they were last year, which decreases projected future financial assistance for plans not receiving SFA.²⁶ Because interest rates increased somewhat over the same period, expected returns on assets are increased, which decreases projected future regular financial assistance. Because future regular financial assistance is paid well into the future, the present value is highly sensitive to interest rates, and decreased slightly due to the higher interest rates. Reflecting these changes increases the projected net position by \$3.3 billion.
- **Model Improvements** – Various minor programming refinements were made to the ME-PIMS model in conjunction with this report. The combined effect of these updates decreases the projected net position by \$1.0 billion.
- **Other Assumption Changes** – Modifications to assumptions include an update to (1) the asset allocations and return assumptions for multiemployer plans, (2) active population decline assumptions, (3) projected administrative expenses, (4) the base mortality table for determining plan cash flows, and (5) certain assumptions used for purposes of determining which plans are “booked” as probable losses by PBGC. Details about each of these assumption changes can be found in the **Changes from the Prior Year** section of the Appendix. Reflecting these changes decreases the projected net position by \$2.9 billion.

²⁶ The S&P 500 index returned 28.7% during calendar year 2021.

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 regular 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 2021, but the rate used to discount the projected FY 2031 net financial position back to FY 2021 is not changed for this sensitivity analysis.

Figure 11 – Sensitivity of Net Financial Position to Discount Rate Changes			
Present Value at the end of FY 2021 (\$ in billions)			
	+50 Basis Points	Baseline	-50 Basis Points
FY 2031 Multiemployer Net Financial Position	(\$3.7)	(\$5.1)	(\$6.8)

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 2031 Multiemployer Program net position would improve by \$1.4 billion. Discount rates 50 basis points lower would worsen the mean net position by \$1.7 billion in FY 2031.

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 22.7 million participants in about 23,900 pension plans. The Single-Employer Program's financial status has evolved from recent deficits to a positive net financial position projected to grow over the next 10 years. None of the projected scenarios result in PBGC's Single-Employer Program running out of money within the next 10 years. The projected growth in the net financial position over the upcoming 10-year period is due primarily to premium revenue exceeding the cost of claims. High premium revenue results from increasing premium rates and higher premiums paid by underfunded plans, which are subject to the variable rate premium. However, despite these projections, there is uncertainty around whether and by how much the Single-Employer Program's net position will grow over this period.

The information in this report starts with PBGC's existing assets and liabilities as of September 30, 2021. However, because the variable rate premium for the majority of single-employer plans is based on interest rates and assets as of January 1, PBGC projects future results from the actual December 31 net position. SE-PIMS is used to project:

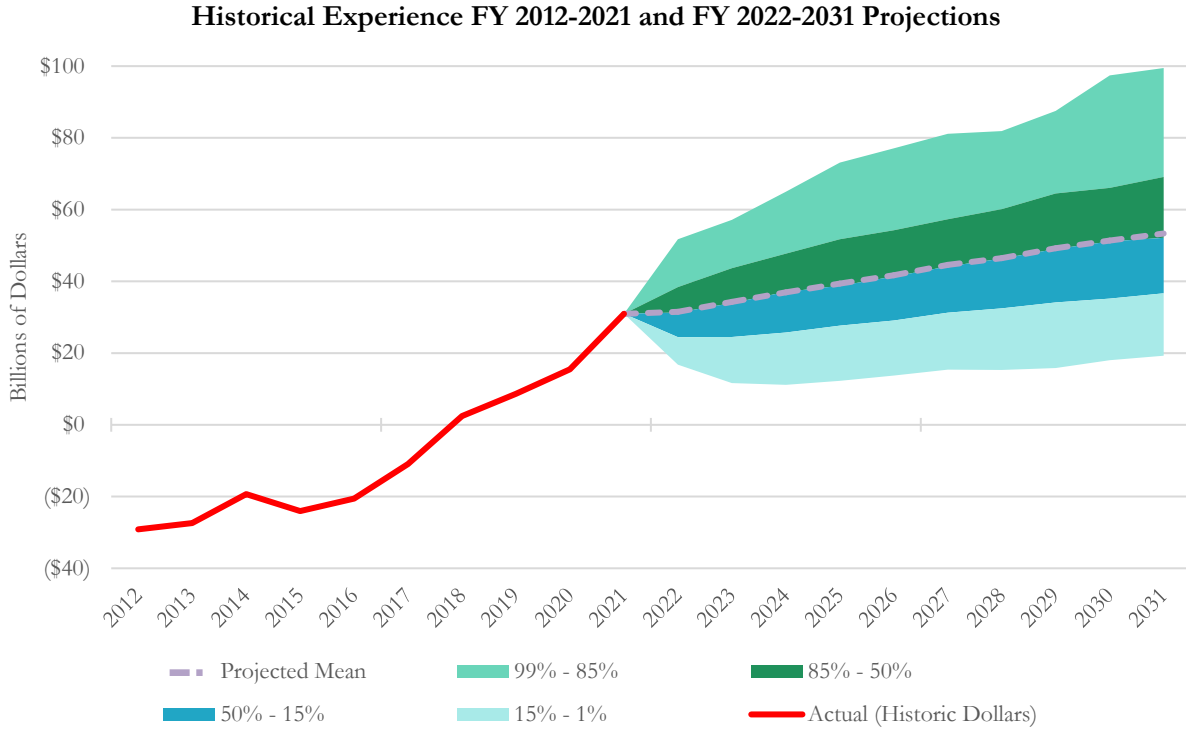
- Future premium income.
- Assets and liabilities for single-employer plans that may become future PBGC claims and increase PBGC's benefit obligations (assets include plan assets and additional assets that may be recovered from the sponsors of terminating plans).
- Future investment income on PBGC assets, based on PBGC's investment policy and asset allocations.

SINGLE-EMPLOYER PROJECTIONS OF NET FINANCIAL POSITION

The FY 2021 projections show that the Single-Employer Program net financial position is likely to continue to improve. This is similar to the pattern reported last year.

Figure 12 shows PBGC's actual net position for FY 2012 to FY 2021 and selected ranges of projected net positions for the next 10 years. As shown in the FY 2021 Single-Employer Program financial statements, assets of \$150.7 billion and liabilities of \$119.8 billion result in a positive net position of \$30.9 billion at the beginning of the projection period. The uncertainty of PBGC's financial position, as shown by the widening cone of results, grows in the future. This year's mean projected present value net position in FY 2031 is \$53.3 billion, an increase of \$3.4 billion from the comparable numbers in the FY 2020 report. Expressed in nominal terms, the mean projected net position in FY 2031 is \$71.2 billion.

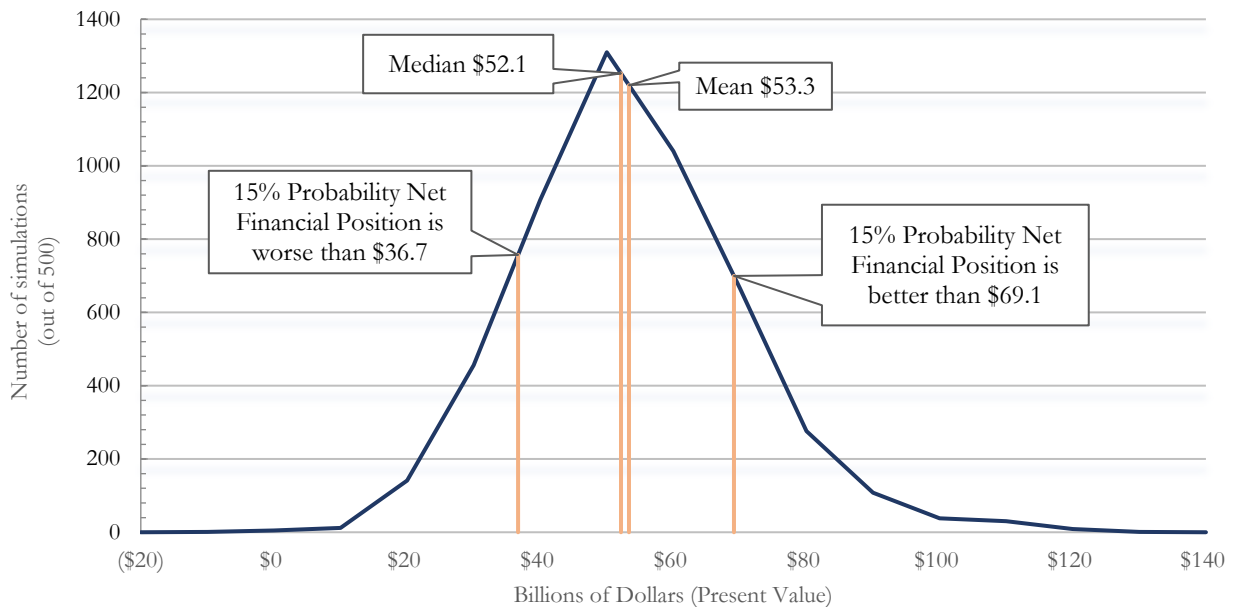
**Figure 12 – Single-Employer Program Projected Net Financial Position
(Mean and Percentile Scenarios)**



The projected improvements to PBGC’s net position over the 10-year period are due to the projected continuation of recent experience with PBGC premiums exceeding projected claims.

Figure 13 shows the full range of the 5,000 outcomes projected by the model for PBGC’s Single-Employer Program’s financial position for FY 2031. This includes the scenarios that fall below the 1st percentile and above the 99th percentile. For the Single-Employer Program projection, there is only one scenario/bankruptcy cycle that results 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 13 – Potential FY 2031 Single-Employer Program Net Financial Position



Vertical lines on the graph show the present value of PBGC’s projected FY 2031 net position at the 15th and 85th percentiles and the mean and median values of projected net positions. The median is a \$52.1 billion positive net position in FY 2031, while the mean is a \$53.3 billion positive net position. The potential range of results on the FY 2031 net position goes from negative \$5.5 billion to \$127.5 billion.

VARIABILITY IN SINGLE-EMPLOYER FINANCIAL POSITION

As described above, there is uncertainty in PBGC’s Single-Employer Program projections. **Figure 14** 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 2031 net financial position. The considerations related to each factor are explored in the rest of this section.

Figure 14 – Variability in 2031 Single-Employer Net Financial Position Present Value at the end of FY 2021 (\$ in billions)			
	Mean	15 th – 85 th Percentile Range	1 st – 99 th Percentile Range
PBGC Net Financial Position			
1. FY 2021 Actual	\$30.9	\$30.9	\$30.9
2. FY 2031 Projected	\$53.3 ^a	\$36.7 - \$69.1	\$19.3 - \$99.5
Present Value of Financial Activity Expected During FY 2022 – FY 2031			
3. New Claims Incurred	(\$4.1)	(\$0.2) – (\$8.3)	(\$0.0) – (\$26.1)
4. Premiums Received ^b	\$33.3	\$26.6 - \$41.1	\$23.8 - \$54.2
5. Asset/Liability Gain	(\$6.7)	(\$24.1) - \$9.5	(\$39.7) - \$42.4
6. Benefits Paid	\$68.0	\$63.8 - \$72.6	\$60.3 - \$88.7

a) If expressed in nominal terms, the mean projected net financial position for FY 2031 is \$71.2 billion.

b) \$33.3 billion mean premium income is the sum of \$17.9 billion in flat-rate premium income and \$15.3 billion in variable-rate premium income (difference due to rounding). The variability in premium income is largely attributable to variable-rate premiums.

Financial Position

Figure 14 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 from the uncertainty around future claims, premium income, which fluctuates with changes in plans’ underfunding, and investment returns on the portion of PBGC assets not matched to PBGC’s benefit liabilities. Within the 15th to 85th percentile range of outcomes, the Single-Employer Program’s present value of projected financial position in FY 2031 varies by \$32.4 billion (discounted to September 30, 2021).

Bankruptcy and New Claims

When companies in bankruptcy or financial distress terminate their underfunded plans, the 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.²⁷ **Figure 14** shows the mean and the range of outcomes for new claims.

²⁷ 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.

In **Figure 15**, the inner banded area shown in dark green around the projected mean represents the range of outcomes between the 15th to 85th percentiles while the full shaded area represents the 1st to 99th percentile level of claims.²⁸ 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 mean claims over the 10-year period, largely due to a projected improvement in plan funding. 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 are the result of favorable economic projections, which reduce both plan underfunding and the likelihood of plan sponsor bankruptcies.

**Figure 15 – Single-Employer Program Net New Claims
(Mean and Percentile Scenarios)**

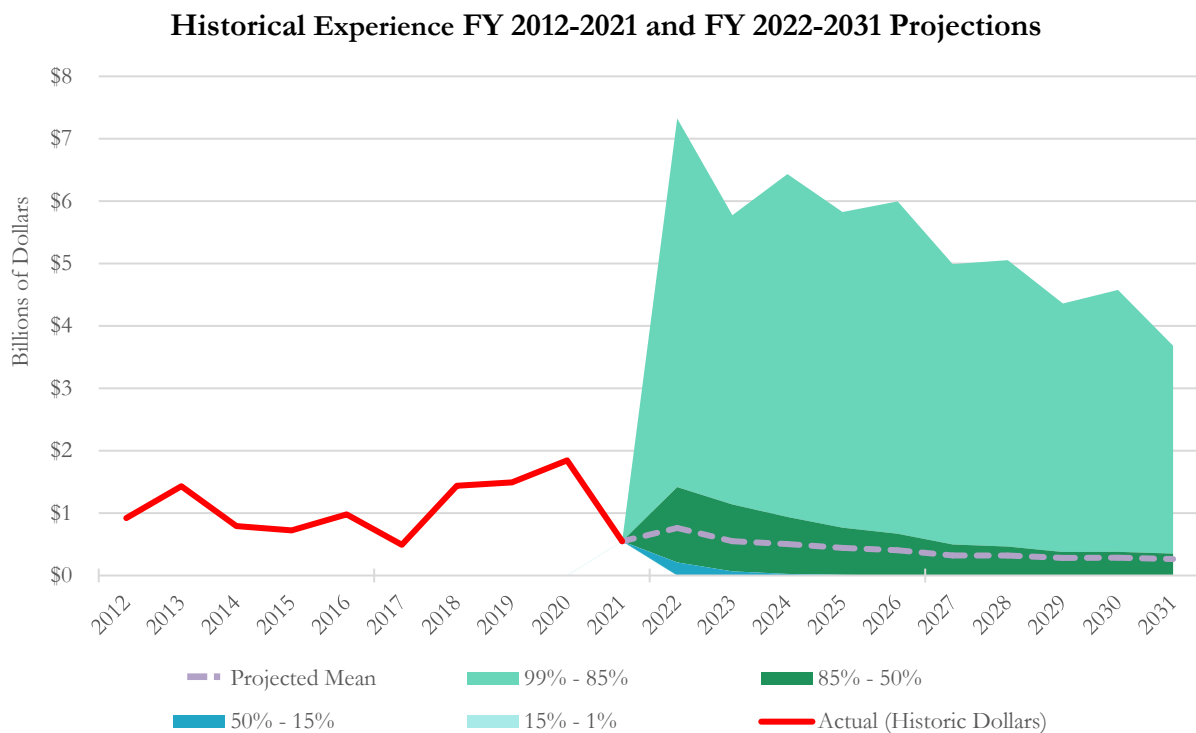


Figure 14 and **Figure 15** each show that SE-PIMS estimates a very small level of claims in favorable projection scenarios (less than \$300 million total from FY 2022 to FY 2031 at the 85th percentile). This claims level would be significantly smaller than claims historically incurred by PBGC during favorable years. This is primarily due to the heavier weighting of SE-PIMS toward larger plan sponsors and the assumption that well-funded plans will terminate via standard terminations rather than generate PBGC claims.

²⁸ The figure 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, 2021, 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).

Premium Income

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

Even though additional premium revenue improves PBGC's net position, higher variable rate premiums are associated with downside scenarios where asset returns are low and interest rates decrease, both of which increase plan 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 and the premium structure helps dampen volatility and mitigate risks in the Single-Employer Program.

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, high investment returns tend to offset increases in the value of PBGC's liabilities, and low investment returns tend to offset decreases in the value of PBGC's liabilities. However, a small portion of assets is invested with the objective of achieving higher returns.

Figure 14 shows the asset/liability gain, 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 \$24.1 billion to a gain of \$9.5 billion in the 15th to 85th percentiles, expressed as present values discounted to 2021. The current version of SE-PIMS projects a mean asset/liability loss of \$6.7 billion. This stems from projected PBGC administrative expenses, as well as simplified modeling of PBGC's interest rate hedging strategy.

SINGLE-EMPLOYER RECONCILIATION OF FY 2020 PROJECTIONS TO FY 2021 PROJECTIONS

Figure 16 provides a detailed reconciliation of the projection results due to changes in the model and data from last year's projections to the FY 2021 projections. The mean projected position at the end of the projection period has increased by about \$3.4 billion, to a present value of projected net position of \$53.3 billion. This results from an expected \$3.5 billion increase expected solely due to the passage of time, along with various offsetting changes due to updated data and changes to the SE-PIMS model that reduce the mean net position by \$0.1 billion.

Figure 16 – Reconciliation of Changes in Single-Employer Projection Results	
Present value at the end of FY 2021 (\$ in billions)	
1. FY 2030 Mean Net Financial Position from FY 2020 Projections Report	\$49.9
2. Passage of Time	<u>3.5</u>
3. Expected FY 2031 Mean Net Financial Position [(1) + (2)]	\$53.4
4. Changes	
a) New Plan, Sponsor, and PBGC Data	(2.1)
b) New Economic Data	3.2
c) Model Improvements	(1.2)
d) Legislative Changes	<u>0.0</u>
e) Total Changes [(4a)+(4b)+(4c)+(4d)]	(\$0.1)
5. FY 2031 Mean Net Financial Position [(3) + (4e)]	\$53.3
6. Adjustment from Present Value to Nominal Value	<u>17.9</u>
7. Nominal Value of FY 2031 Mean Net Financial Position [(5) + (6)]	\$71.2

Note: The order of changes impacts the magnitude of each change.

Passage of Time. The FY 2020 report projected PBGC's net position in FY 2030 and presented the results valued in 2020 dollars. To compare with the FY 2021 report, which projects to FY 2031 with values reported in 2021 dollars, the FY 2020 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 \$3.5 billion in the projected net position.

Plan, Sponsor, and PBGC Data. Between the FY 2020 and FY 2021 Annual Reports, PBGC's net position improved more than was projected with FY 2020 SE-PIMS, primarily due to lower claims, higher premiums, and favorable investment returns experienced during FY 2020. However, updated single-employer plan data results in both claims and premiums being projected at lower levels than would be projected using last year's data. The combination of these updates reduces the projected net position by \$2.1 billion.

New Economic Data. The different economic climate in FY 2021 compared to FY 2020 resulted in changes to the economic assumptions upon which all the SE-PIMS projections are based. Strong equity

returns in 2021 increased plan assets more than expected and slightly higher long-term interest rates led to higher future expected asset returns. These changes increase projected plan funding, decrease future claims, and decrease future variable rate premium revenue. High levels of inflation reported at the end of 2021 have only a small impact on these results.²⁹ The net effect of these changes was a \$3.2 billion increase in the projected net position.

Model Improvements. Several improvements have been made to the modeling for this year's report. The changes include updates to future claims (and ongoing plan assets and liabilities) to better reflect assumed standard terminations, a simplifying adjustment to the plan sponsor contribution policy assumption, an adjustment to reflect premium receipts expected in the latter part of the current fiscal year, and updates to how mortality is modeled within PIMS. The combined effect of these changes is a \$1.2 billion decrease in the projected net position.

Legislative Changes. The Infrastructure Investment and Jobs Act of 2021 (IIJA) further defers the narrowing of the corridor around 25-year average interest rates used to value pension plan liabilities for minimum required funding purposes by five years. This lowers plan contribution requirements resulting in lower projected plan funding positions, higher levels of projected PBGC claims, and higher levels of projected variable rate premium revenue. However, the SE-PIMS assumption for employer contributions is only based in part on minimum funding requirements. As a result, IIJA only results in a minor \$45 million increase in PBGC's projected net position.

²⁹ Any direct or indirect impact of inflation after December 31, 2021, (actual or expected) is not reflected in this report.

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 2021, but the rate used to discount the projected FY 2031 net financial position back to 2021 is not changed for this sensitivity analysis.

Figure 17 – Sensitivity to Discount Rate Changes in Single-Employer Results			
Present Value at the end of FY 2021 (\$ in billions)			
	+50 Basis Points	Baseline	-50 Basis Points
FY 2031 Single-Employer Net Financial Position	\$54.3	\$53.3	\$50.7

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 2031 Single-Employer Program net position would improve by \$1.0 billion. Discount rates 50 basis points lower would decrease the mean present value of the net position by \$2.6 billion.

SINGLE-EMPLOYER STRESS TEST SCENARIO

Nearly all scenarios in the current SE-PIMS model project a positive net position in FY 2031. The variability in future net position is dampened because decreases in plan funding positions associated with high claim amounts also result in increases in variable rate premium revenue. However, SE-PIMS may not capture all types of extreme events that PBGC could face in the future. Thus, it is informative to consider extreme events that may pose risk 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 \$1.5 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.³⁰ Approximately two-thirds of this amount (\$18.9 billion) is attributable to six of the 10 largest claims events in PBGC's history.³¹ 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 exceed the level of PBGC's positive net position as of September 30, 2021.

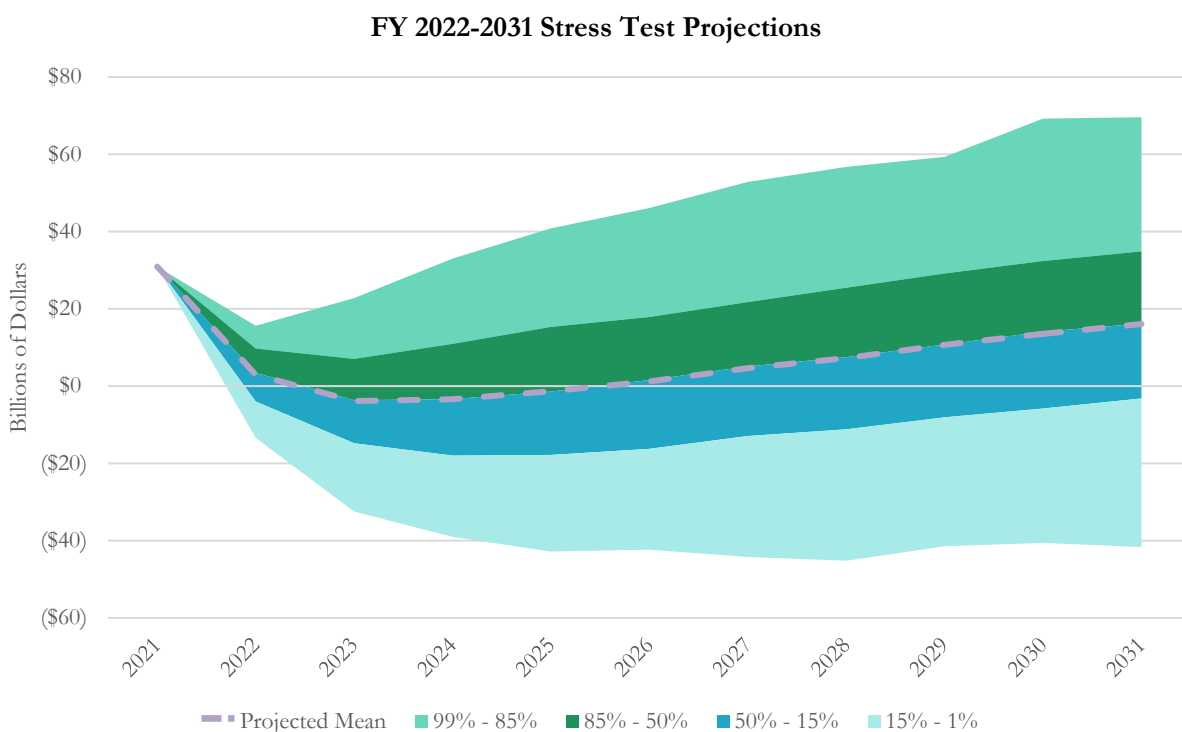
³⁰ Annual historical claims for the Single-Employer Program are shown in Table S-4 of PBGC's 2019 Data Tables.

³¹ These 10 firms are shown in Table S-5 of PBGC's 2019 Data Tables.

The illustrative stress test scenario was designed to represent a similar high-claims event characterized by the combined impact of a market downturn and recessionary environment with elevated rates of bankruptcy. This was developed by modeling a one-time negative 20% plan asset return in the first year of the projection period coupled with increases in assumed bankruptcy rates such that PBGC incurs above \$40 billion in new claims from FY 2022 through FY 2026.³² The claims are assumed to be 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 below illustrates the estimated change in the net position of the Single-Employer Program (nominal dollars) during the 10-year projection period.

Figure 18 – Single-Employer Program Projected Net Financial Position Under Stress Test^a (Mean and Percentile Scenarios)



a) The “Stress Test” assumes for all stochastic scenarios: (1) a 37% drop in equities in the first projection year; and (2) a 40% 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.

Figure 18 shows a drop of over \$30 billion in the net position during the first two years of the projection, from PBGC’s actual net position of \$30.9 billion in FY 2021 to a negative \$3.9 billion mean net position in

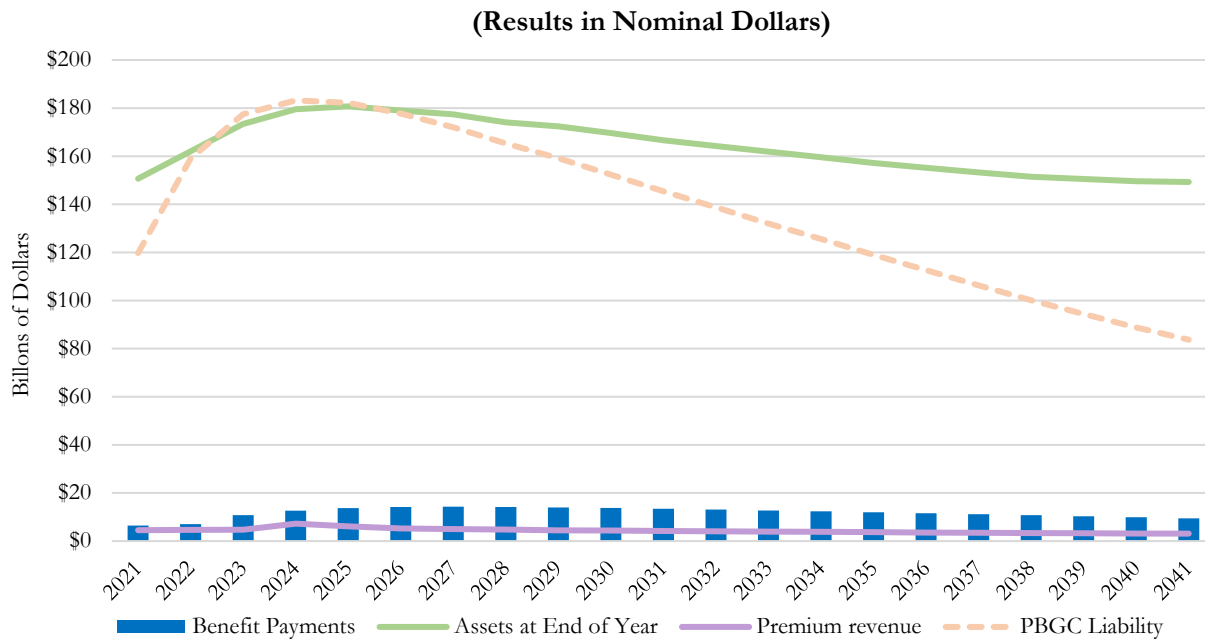
³² For modeling purposes, the -20% plan asset return was generated by assuming a -37% return on equities and the claims level was generated by assuming that plan sponsors with a credit rating of B+ or lower have a 40% probability of bankruptcy in each year of the projection. The objective of the modeling 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 \$40 billion during the first five years of the projection period. This level of claims is larger than any 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.

FY 2023. This initial drop is primarily due to the influx of new claims early in the period, in which nearly two-thirds of plan sponsors with a B+ or lower rating go bankrupt in the first two years of the projection. Poor performance in PBGC's trusted asset pool in the first year of the projection also contributes to the decline. However, in the ensuing eight years, the Single-Employer Program's mean net position improves each year to reach a positive mean net position of \$16.1 billion by FY 2031. The projected recovery in the mean is attributable to premiums exceeding claims in FY 2023 and beyond. This is due primarily to an increase in variable-rate premium income resulting from lower plan funded levels following the initial asset decline. The rate of projected claims decreases annually as the number of plan sponsors with a B+ or lower rating quickly diminishes.

The stochastic range of projected outcomes is wider under the stress test scenario (a \$111.3 billion difference in projected net position from the 1st percentile to the 99th percentile) than under the baseline SE-PIMS projection shown in **Figure 12** (an \$80.2 billion difference in projected net position from the 1st percentile to the 99th percentile). However, it should be noted that the stress test scenario already incorporates extreme circumstances at the onset of the projection which may cause the full range of adverse outcomes to be overstated.

Although the stress test scenario projects the net position to temporarily go negative, the Single-Employer Program would be expected to return to a positive net position by the end of the 10-year period. Even under this extreme hypothetical event, the Single-Employer Program's ability to pay guaranteed benefits remains intact. **Figure 19** shows the mean projection of assets in the single-employer fund, as well as annual premium revenue and expected benefit payments to participants in trusted plans. The mean value of PBGC's trusted liabilities is also shown to convey the mean net position throughout the projection period (the difference between the solid green and dotted orange lines in the graph). For this purpose, the projection is expanded to 20 years, which is the maximum projection window available under SE-PIMS.

Figure 19 – PBGC Single-Employer Program Assets, Liabilities, Benefit Payments, and Premiums by Fiscal Year Under Stress Test^a



a) The “Stress Test” assumes for all stochastic scenarios: (1) a 37% drop in equities in the first projection year; and (2) a 40% 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 highly adverse experience during the first couple years of the projection period (large equity drop coupled with significant bankruptcy events), single-employer fund assets increase by roughly \$30 billion in the first few years of the projection period. This is primarily due to the influx of assets from newly trusted plans. PBGC would also assume liabilities for these claims that exceed the level of these assets. From FY 2025 onward, the Single-Employer Program’s assets gradually decline as participant benefits are paid until assets are at roughly the same level in FY 2041 that they were in FY 2021 (\$150 billion). The rate of decline in the Single-Employer Program’s liabilities over this same period is steeper than the decline in single-employer fund assets. This demonstrates that, even over long-term, PBGC’s ability to pay out guaranteed benefits would not be jeopardized under this extreme event.

The stress test scenario described in this report section is illustrative only and is not in any way predictive of future experience. Even despite a resemblance to claims from 2001 to 2006, an event that includes both these steep market losses and very high claims levels would represent a rare occurrence. The scenario is intended to provide insight into the financial resiliency of the Single-Employer Program in the case of a particular type of extreme outcome.

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, 2021.

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 checked 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. 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 an 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
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 over 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, MPRA applications, and SFA-related assumptions. SE-PIMS reflects anticipated plan sponsor behavior related to contributions and standard terminations.

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 2021), but shows nominal values in certain figures (present values at the end of FY 2031 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, the 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. Related variables include inflation, wage growth, and increases in benefits for flat-dollar plans.

- Stock returns are modeled as independent from one period to the next. To determine a simulated sequence of stock returns, the model randomly draws returns from a distribution that reflects historical experience going back to 1926.
- Interest rates 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, 2021, monthly values of the 30-year Treasury yield averaged 70 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 70-basis point spread over the median projected inflation rate. The inflation assumption for this year's report implies a median rate of inflation of 2.4%, resulting in the median projected 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 rising 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.
- The random draws affecting the bond yields and stock returns are correlated according to an estimate derived from the period 1973 to 2007.³³ Stock returns are more likely to be high when the Treasury yield is falling and vice versa. Credit spreads on investment-grade corporate bonds are modeled to regress toward their historic mean values.

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 historic asset returns among large plans that estimated the mixture of the three available economic variables that best fit those historic 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. The representation of the plan asset allocation used in SE-PIMS and ME-PIMS is shown in the table below.

³³ This assumption was subsequently reviewed by PBGC in conjunction with the FY 2020 Projections Report; it was determined that the estimate derived in that time frame is still representative of current correlation rates.

Representation of Plan Asset Allocation

	S&P 500 Return	30-Year Treasury Return	30-Year Treasury Yield
SE-PIMS	48%	22%	30%
ME-PIMS	65%	15%	20%

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 a “policy” allocation roughly equal to the average allocation from the most recent Form 5500 Schedule R. The policy allocation target is shown below.

Assumed Policy Allocation Target for Plans with SFA

Asset Class	Target Policy Allocation %
Equity	45%
Other Return-Seeking Assets	35%
Investment Grade Fixed Income	20%

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 plan has depleted all its SFA funds, which are assumed to be used as soon as possible.

ME-PIMS

ME-PIMS — Overview

Each fiscal year-end, in preparing its financial statements in accordance with accounting principles accepted in the United States of America (U.S. GAAP), 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 classified as a probable risk of requiring future financial assistance and recorded in PBGC’s year-end financial statements as a balance sheet liability and income statement expense, PBGC evaluates whether the plan is likely to become insolvent within the next 10 years, taking into account the most recently available detailed plan and industry data. Each plan is determined to either be recognized (“booked”) as a liability for the financial statements or not to be included in the accrued liabilities at all. In addition, PBGC discloses the

aggregate dollar amount of those multiemployer plans categorized as reasonably possible (plans projected to become insolvent within the next 11 to 20 years).

In the Multiemployer Program, a probable liability is estimated (and booked on PBGC's financial statements) when cashflow insolvency is projected to occur within 10 years. 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 2021 ME-PIMS valuation 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, projected PBGC liabilities and projected regular financial assistance payments reflect the estimated favorable impact on plan underfunding of SFA payments that are expected to be paid to eligible and approved plans. PBGC will receive recurring funding to cover all approved SFA payments and SFA administrative costs from the Treasury general fund via uncapped appropriations provided in ARP. Given the duration of the SFA Program and the "pass-through" nature of SFA cash flows, those SFA funding and payment entries are not expected to materially affect the projected likely financial position of PBGC in 2031, which is the central focus of this report.

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 prior 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 ratio is 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 was extended, 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 filed participant notices and other information available to PBGC.

Data on withdrawal liability payments and regular ongoing employer contributions. For plans with greater than 5,000 participants, withdrawal liability payment data was obtained from the 2019 Schedule MB attachments. For critical and declining plans with a greater than 20% 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 2019 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. 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 during the base year.

For plans that have already been booked in PBGC’s financial statements, PBGC collects additional data, 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 changes in benefit formula (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 or alter their behavior 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 2022 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 2031 are assumed to make a one-time decision in 2031 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 were collected for approximately 900 plans for the FY 2021 report. 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 the Form 5500. This is done separately for terminated vested participants and for in-pay retirees and beneficiaries.

ME-PIMS — Assumptions

In addition to the economic variables described above, several plan demographic variables are 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 – 3.0%
- Critical and Declining plans: 5.1%

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 2036 with the MP-2020 Improvement Scale.

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 a 6.0% per year increase for 12 years, except that, for the first five years after the valuation date, the increase rate will not be less than the recent five-year historical average increase rate as of the valuation date. The target rate noted above is a rate, which 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. Per capita contribution growth is lowered to national average wage increases (NAWI) after 12 years (or the cumulative cap is hit).
- 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 for 15 years, and then increase by NAWI thereafter.

Per capita contributions for all plans will be further limited to a multiple of 2.5 times the 2009 baseline per capita (based on contributions divided by active participant count from the 2009 Schedule MB), after which inflation/wage growth becomes the underlying increase rate.

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

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 (approximately a \$7 increase) is added to the above-calculated expense starting in 2031.

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.

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.

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. 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 70% of employers assumed to 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. 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 discounted with a single interest factor (under each scenario) that models the curve of interest factors described in PBGC’s financial statements (using the simulated 30-year Treasury rate generated for the particular year and economic path plus 42 basis points). Those factors are based on a survey of private-sector annuity market prices.

Discounting Future Present Values (i.e., the “nominal” values) Shown in Report Tables. Future nominal values (but not the present value of claims at such dates – see above) are discounted to September 30, 2021, using the simulated 30-year Treasury rate generated for the particular year and economic path.

Assumptions about Benefit Suspensions and Partitions. By law, plans receiving SFA are not permitted to enact future 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 done only in 2031. 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 inputted 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 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 2021 ME-PIMS valuation assumes that all plans that become eligible for SFA by the 2022 plan year will apply for it. Plans that are very close to meeting the eligibility criteria under ERISA section 4262(b) may take action(s) to become eligible for SFA (e.g., modify their actuarial assumptions). To account for this plan behavior, ME-PIMS uses modified eligibility criteria:

- For purposes of determining a plan’s zone status for SFA eligibility:
 - Projected contributions are reduced by 5% per year for the first two years.
 - 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%.

Due to the high degree of uncertainty related to application timing, ME-PIMS uses a simplified assumption: plans in the first four priority application groups under PBGC’s final rule are assumed to be paid SFA in 2022, plans in the remaining priority application groups are assumed to be paid SFA in 2023, and all other plans are assumed to be paid SFA in 2024 and 2025. All SFA applications are assumed to be approved in the first filing.

The actual SFA amounts for each eligible plan are estimated stochastically with the exception of the largest plan that has applied for SFA, the Central States, Southeast & Southwest Areas Pension Plan (“Central States”). For the Central States plan, information from the April 28, 2022, SFA application under the interim final rule was used as the basis to estimate a fixed SFA amount under final rule provisions in each of the 500 model scenarios.

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 stochastic projection to the application date. The SFA is then calculated using a deterministic projection based on assumptions as follows:

- Interest Rates:
 - For non-SFA assets, the lesser of 5.3% or the interest rate shown on the most recent Schedule MB. The 5.3% rate is an estimate of the third segment rate as of December 31, 2021, plus 200 basis points (per ERISA section 4262(e)(3)).
 - For SFA assets, the lesser of 2.9% or the interest rate shown on the most recent Schedule MB. The 2.9% rate is an estimate of the average of first, second and third segment rates as of December 31, 2021, plus 67 basis points (per the SFA final rule).
- 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 valuation purposes.
- Administrative expenses: the same administrative expenses assumption used for other ME-PIMS valuation purposes.
- Withdrawal liability payments – same as the standard ME-PIMS assumptions. This is consistent with the conditions placed on withdrawal liability calculations under PBGC’s final rule, which limits the impact of SFA on future withdrawals. It is consistent with the assumed CBU decline noted above (i.e., moderate CBU decline rates are consistent with a low level of employer withdrawals).
- Other assumptions: no changes from the assumptions used for other ME-PIMS valuation purposes.

Plan Demographics to Facilitate Cash Flow Modeling. To determine cash flows, ME-PIMS utilizes these 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 federal funding over time for the United Mine Workers 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 have been provided to OMB by the Office of Surface Mining Reclamation and Enforcement (OSMRE), U.S. Department of the Interior. In the ME-PIMS model, these estimated annual amounts are treated as additional contributions in the projections of plan assets. There are no estimates of transfers to the pension plan beyond FY 2031, so for purposes of the projections in this report, the estimated transfer amount is assumed to stay level after FY 2031 until the United Mine Workers Plan is fully funded.

The annual federal transfer amounts provided by OMB for FY 2021 through FY 2031, and then updated for FY 2022 through 2032, used for the projections in this report (until the plan is fully funded) are as follows:

Estimated Federal Transfers to United Mine Workers Plan (provided by OSMRE)		
	Transfer Amount (in millions)	
Fiscal Year (FY)	FY 2021 Projection	FY 2022 Projection
FY 2021	\$322	N/A
FY 2022	\$276	\$382
FY 2023	\$274	\$381
FY 2024	\$287	\$463
FY 2025	\$303	\$506
FY 2026	\$314	\$528
FY 2027	\$332	\$529
FY 2028	\$328	\$526
FY 2029	\$338	\$521
FY 2030	\$349	\$516
FY 2031	\$358	\$500
FY 2032 and later	\$358/year	\$500/year

SE-PIMS

SE-PIMS — Overview

PBGC's expected claims under the Single-Employer Program depend on two factors: (1) the amount of underfunding in the 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 close to 500 very large 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 close to 500 actual plans, sponsored by more than 300 companies. These plans represent over half of PBGC's insurance exposure in the single-employer defined benefit system measured from the 2019 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:

- Summary statistics on plan demographics,
- Plan benefit structure,
- Asset values,
- Liabilities,
- Actuarial assumptions, and
- Key financial information about the employer sponsoring the plan.

Plan data are downloaded from Schedules SB, R, H, and I of the Form 5500 database for the most recently available years 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.

Fundamental 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 [Data Tables](#).

PBGC reviews the data inputs – including 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.

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 50 to 60% funded is compared to the same total for the insured universe, and similarly for plans that are 60 to 70% funded, 70 to 80% funded, etc. Partners are allocated for a 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 equity-to-debt ratio, cash flow, firm equity, and employment.³⁴ 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.

SE-PIMS models contributions from plan sponsors based on meeting minimum funding requirements, avoiding variable rate premiums, maintaining, or regaining prior funding levels (based on liability measurements used in corporate financial accounting), and incentives to attain a funding threshold that

³⁴ 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.

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. The model runs 500 economic paths (varying interest rates and equity returns) with each plan’s sponsor being “cycled” through each economic path 10 times (with varying financial health experiences, bankruptcy probabilities, etc.) for a total of 5,000 different simulations.

SE-PIMS — Assumptions³⁵

The following variables are stochastically projected:

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

Plan Demographics. 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. All participants are assumed to be male and are assumed to elect straight life annuities.

Probability of Bankruptcy. Sponsors are subjected to an annual stochastic chance of bankruptcy. That 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.³⁶ 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 for termination liability. If the sponsor of a plan is simulated to experience bankruptcy and the plan is more than 80% funded for termination liability, the plan is assumed to be terminated through the standard termination process.

Voluntary Standard Terminations of Pension Plans. In addition to the above-mentioned standard terminations related to bankruptcy, PIMS also assumes an additional percentage of plans will choose to go through the standard termination process. The 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.³⁷

³⁵ 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>.

³⁶ 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.

³⁷ 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>.

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

Mortality.³⁸ For the present value of PBGC benefit payments: the blended RP-2014 Healthy Male mortality table times 1.09, with generational projections using the MP-2020 scale. This is based on a study of PBGC-insured participants and is the same table used in PBGC's September 30, 2021, financial statements.

For the sample plans' year-by-year experience mortality during the projection period: the same mortality as used for the present value of PBGC benefit payments.

For purposes of determining minimum funding requirements: RP-2006 male (with separate annuitant and non-annuitant tables) generationally projected from 2006 using the following mortality improvement scales:

- MP-2020 for 2020 and later projection years.
- MP-2019 for calibrating to the 2019 Schedule SB.
- MP-2018 for calibrating to the 2018 Schedule SB (when a 2019 Schedule SB was not available at time of data preparation).

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.³⁹

Contributions and Credit Balances. Contributions are assumed to be driven by incentives such as complying with minimum funding requirements, reducing the variable rate premium (VRP), and maintaining funded status at certain levels that are potentially based on accounting, termination, or other liability measures. The primary funded ratio measure driving contribution behavior is assumed to be based on the vested benefit liability (VBL) used to determine the VRP. 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 as a result of funding to or beyond 100% of the VBL are assumed to be motivated by different factors than plans that have not funded to that level. The 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 100% of the VBL within the last three years are assumed to make the largest of the following contributions.

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

³⁸ PBGC uses a mortality table based on the actual experience of trustee plan populations with generational projections to determine the pension benefit liability in the Annual Report.

³⁹ The 9% 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.

- 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.

- 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
Sum 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 VBL funded ratio in last 3 years
Plus: the following 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 upwards for higher VRP rates, with all plans assumed to immediately fully fund the VBL if the VRP rate ever reaches \$100. The VRP factor is adjusted downwards for VRP rates lower than \$30 with no plans funding toward the VBL at a VRP rate of \$0.

Actual 2021 and 2020 contributions and the associated minimum required contributions are used to update the information from the 2019 Form 5500 filings where available as of the data compilation date.

Form of Payment. Except for certain cash balance plans, SE-PIMS assumes all benefits will be paid as 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.** Because the benefit improvement restriction does not apply to benefit increases unless they exceed the average wage increase and PIMS projects benefit increases proportionally with wage increases, 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 provisions regarding future indexing and provisions in the SECURE Act of 2019 for lower premium rates for CSEC plans. There is no allowance in premium projections for write-offs of uncollectable premiums. Premiums are assumed paid by the employer rather than from the plan assets.

PBGC Guarantee Limits. SE-PIMS models the level of benefits 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 in excess of the maximum benefit guarantee level are not modeled.

PBGC's Assets. PBGC's investment policy as of September 30, 2021, is assumed to remain consistent through the projection period, with 15% allocated to return-seeking assets.⁴⁰

Discounting Future Claims. Future claims are discounted with a single interest factor (under each scenario) that models the curve of interest factors described in PBGC's financial statements (using the simulated 30-year Treasury rate generated for the particular year and economic path plus 42 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.

⁴⁰ PBGC's investment policy can be found here: <https://www.pbgc.gov/sites/default/files/april-2019-ips-pbgc.pdf>.

SAMPLE STATISTICS FROM FY 2021 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 2021 Single-Employer Model Runs ^a (Across 2021-2031 for 500 Economic Paths)			
	Long-Term Treasury Yield	Return on 30-year Treasury Bonds	Stock Market Return
Mean	3.0% ^b	0.2%	7.6%
Standard Deviation	1.1%	8.7%	20.0%
Correlations:			
Long-Term Treasury Yield	1.00	-0.16	0.00
Return on 30-year		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.

b) The discount rate used to value PBGC liabilities and claims is this rate plus 42 basis points for both insurance programs.

Figure A- 2

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

FY 2021 Single-Employer and Multiemployer Model Runs			
	Long-Term Corporate Rate	Inflation Rate ^a	Wage, Salary, and Flat Benefit Growth Rate
Mean	4.1%	2.6%	3.9%
Standard Deviation	1.2%	1.1%	1.1%

a) Any experience and changes in future expectations pertaining to inflation following December 31, 2021, are not reflected in this report.

Figure A- 3
FY 2021 Model Projected Plan Returns

	Single-Employer	Multiemployer ^a
Arithmetic Mean	4.5%	5.4%
Geometric Mean	4.0%	4.6%
Standard Deviation	10.1%	13.5%

a) ME-PIMS projected plan return is for non-SFA plan assets only.

Figure A- 4
Projected Annual Bankruptcy Probabilities^a

FY 2021 Single-Employer Model Runs	
Arithmetic Mean	0.5%
Standard Deviation	1.2%

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 2021 Multiemployer Model Runs	
Arithmetic Mean	0.1%
Standard Deviation	0.05%

CHANGES FROM THE PRIOR YEAR

FY 2021 ME-PIMS includes the following changes from the FY 2020 Projections Report:

Model Improvements. The FY 2020 ME-PIMS model did not have the ability to model SFA and non-SFA assets separately, so the investment restrictions on SFA assets were represented by simplified adjustments. The FY 2021 model has been improved so that it can project SFA and non-SFA assets separately, which allows for better modeling of asset returns for plans that receive SFA. SFA is excluded from plan assets in determining the minimum required contributions. See the **Multiemployer Reconciliation** section above for a summary of the impact of this change on the projections.

Active Population Decrease. The FY 2021 ME-PIMS model used data from the FY 2019 PIMS Peer Review⁴¹ to reflect active population decline based on zone status. The model assumes an average annual decline of 1.0% for plans in Green Zone status, 2.5% for plans in Endangered status, 3.0% for plans in Critical status, and 5.1% for plans in Critical and Declining status.

Return Assumption to Determine Booked Plans. For purposes of determining if the plan is “booked” on PBGC financial statements when cash-flow insolvency is projected to occur within 10 years, the assumed return is the PBGC interest rate used for Discounting Future Claims plus 3.0% as a proxy for the current methodology used to classify plans as probable losses.

Plan administrative expenses. The FY 2021 ME-PIMS model aligns plan administrative expense calculations with SFA amount determinations.

Mortality Table Used to Determine Plan Cash Flows. The base mortality table is updated from RP-2014 Healthy to PRI 2012 Blue Collar. The scaling factor was updated from MP-2019 to MP-2020.

FY 2021 SE-PIMS includes the following changes from the FY 2020 Projections Report:

Model Improvements. Several programming refinements were made to the SE-PIMS model for FY 2021:

- Projected mortality experience within the model was updated to incorporate two-dimensional mortality improvement scales;
- The modeling of a plan’s reported mortality basis, as reflected on the Form 5500, was updated;
- For firms that sponsor multiple plans, the modeling of the impact of voluntary plan terminations on future claims due to bankruptcy was updated;
- The contribution assumption for plans over 100% funded on a premium liability basis was simplified to directly calculate the normal cost based on the premium interest rates.

Infrastructure Investment and Jobs Act (IIJA). The SE-PIMS modeling of statutory minimum required contributions now reflects IIJA’s 5-year extension of the narrower corridor around the 25-year average segment rates.

⁴¹ Full 2019 PIMS Peer Review for Active Participant assumptions can be found here: <https://www.pbgc.gov/sites/default/files/me-active-participants.pdf>.

Mortality Table. For purposes of modeling year-to-year projected mortality experience in the SE-PIMS projections, the base mortality table was updated to the blended RP-2014 Healthy Male mortality table. These base rates are multiplied by 1.09 and projected forward generationally using the MP-2020 improvement scale.

Mortality Improvement Scale. For purposes of determining both minimum funding requirements and the present value of PBGC benefit payments, the improvement scale was updated from MP-2019 to MP-2020.

Substitute Mortality Table. For purposes of determining minimum funding requirements, the 9% mortality load assumed for plans using substitute tables for funding is now applied just to plans reporting use of a substitute table. In prior years, the 9% mortality load was applied to all collectively bargained plans.

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 2021 Report		
10-Year Arithmetic Mean for Single-Employer and Multiemployer Model Runs		
	FY 2021	FY 2020
Long-Term Treasury Yield ^a	3.0%	2.9%
Return on 30-year Treasury Bonds ^a	0.2%	-0.1%
Stock Market Return (Arithmetic) ^a	7.6%	7.4%
Long-Term Corporate Rate	4.1%	4.0%
Inflation Rate ^b	2.6%	2.6%
Wage, Salary, and Flat Benefit Growth Rate	3.9%	4.0%
Projected SE Plan Returns	4.5%	4.3%
Projected ME Plan Returns ^c	5.4%	4.3%
Annual Bankruptcy Probability for SE Plans	0.5%	0.7%
Annual Rate of Plans' Projected Insolvency for ME Plans	0.1%	0.1%

a) ME-PIMS yields economic returns within 0.1% of the Single-Employer Model.

b) Any experience and changes in future expectations pertaining to inflation following December 31, 2021, are not reflected in this report.

c) ME-PIMS projected plan return is for non-SFA plan assets only.