

# FY 2019 PBGC

## PROJECTIONS REPORT

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## FREQUENTLY USED ABBREVIATIONS

ERISA	Employee Retirement Income Security Act of 1974, as amended
ERM	Critical status plans that have determined they have “Exhausted all Reasonable Measures”
FY	Fiscal Year
ME	Multiemployer
MP-2016	Mortality Projection – 2016 Mortality Improvement Scale
MPRA	Multiemployer Pension Reform Act of 2014
PBGC	Pension Benefit Guaranty Corporation
PIMS	Pension Insurance Modeling System
PPA	Pension Protection Act of 2006, as amended
PV	Present Value
RP-2014	Retirement Plans – 2014 Mortality Table
SE	Single-Employer
VBL	Vested Benefit Liability

## EXECUTIVE SUMMARY

The Pension Benefit Guaranty Corporation (PBGC or Corporation) insures against the loss of pension benefits by participants in private-sector pensions. PBGC operates two separate insurance programs, one for single-employer plans and one for multiemployer plans, that are legally separate, and operationally and financially independent. These two programs also offer different benefit guarantees and feature different funding mechanisms. This report provides 10-year projections, ending with FY 2029 (September 30, 2029), of the financial status of both programs under a range of future financial scenarios.

While last year's report projected PBGC's Multiemployer Program would become insolvent during FY 2025, this year's projections show a very high likelihood of insolvency during FY 2026 and that insolvency is a near certainty by the end of FY 2027. This change is due primarily to the enactment of the Bipartisan American Miners Act of 2019, which provided federal funding for the United Mine Workers of America 1974 Pension Plan ("United Mine Workers Plan").<sup>1</sup>

The Multiemployer Program continues to report large deficits (i.e., negative net positions), which, without legislative changes, are expected to grow over time.

Results for this year's projections show PBGC's Single-Employer Program is likely to remain out of deficit over the next decade.

The table below summarizes the main results of this report:

PBGC Projected Net Financial Position for End of FY 2029 Present Value as of September 30, 2019 (\$ in billions)		
	Multiemployer Program	Single-Employer Program
Mean	(\$82.3)*	\$46.3
15th to 85th Percentile	(\$123.1) - (\$50.7)	\$31.9 - \$60.4

\* PBGC's Multiemployer Program is projected to run out of money by the end of FY 2026.

## MULTIEMPLOYER PROGRAM

### *Projected Net Financial Position (Assets vs. Liabilities)*

The results, displayed as present values as of September 30, 2019, show the mean net financial position (i.e., average of all the scenarios modeled) in the Multiemployer Program declining from negative \$65.2 billion, the actual reported net position on September 30, 2019, to negative \$82.3 billion at September 30, 2029 (shown on a present value basis as of September 30, 2019). This represents a decline of \$17.1 billion over the 10-year projection period.

The increase in the projected deficit is due primarily to a considerable decline in both the projected investment returns on plan assets and the discount rate used to value the liabilities, partially offset by a \$6

<sup>1</sup> The legislation, enacted on December 20, 2019, is the Bipartisan American Miners Act of 2019 (Division M of the Further Consolidated Appropriations Act, 2020 (P.L. 116-94)).

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billion improvement resulting from the enactment of the Bipartisan American Miners Act, which is projected to keep the United Mine Workers Plan solvent throughout the projection period under the assumptions used for this report. If the FY 2029 mean net financial position of negative \$82.3 billion is instead expressed in terms of the expected future value as of September 30, 2029, it would be negative \$100.7 billion. For the purposes of this report, this is referred to as the nominal value.

The net financial position is expected to worsen from the end of FY 2019 to the end of FY 2029 due largely to additional multiemployer plans that are projected to become insolvent within the ensuing 20-year period and need financial assistance from PBGC.

#### *Projected Insolvency (Available Funds)*

PBGC's Multiemployer Program is projected to run out of money (i.e., become "insolvent") by the end of FY 2026. While this is one fiscal year later than was projected in the FY 2018 Projections Report, the actual change may be less than 12 months. The primary reason for the change is the enactment of legislation to provide federal funding for the United Mine Workers Plan.

#### *Methods and Assumptions*

The Multiemployer Program model is substantially the same as that used last year, with the major differences being a change to reflect the enactment of legislation providing future federal funding of the United Mine Workers Plan, new plan data, and updated economic assumptions as of September 30, 2019 – the starting point for the projections. These changes are quantified and detailed in **Figure 6**, with additional details about changes in the Appendix.

Out of roughly 1,400 insured multiemployer plans, 124 plans have reported that they will run out of money within 20 years.<sup>2</sup> These plans are in "critical and declining" status under the Employee Retirement Income Security Act (ERISA) and the Internal Revenue Code. When these plans run out of money to pay benefits, they will call on PBGC to provide financial assistance to enable the plan to pay benefits at the guarantee level. As noted earlier, absent legislative changes, PBGC projects the Multiemployer Program will become insolvent during FY 2026 and will be unable to deliver financial assistance in amounts necessary to support benefits at the current guarantee level. The projections in this report estimate the program's future financial assistance costs at the current guarantee level, rather than reducing guarantees to a level supported only by premiums.

Under the Multiemployer Pension Reform Act of 2014 (MPRA), critical and declining status plans may apply to the U.S. Department of the Treasury ("Treasury") for approval to suspend participant benefits in order to avoid future insolvency.<sup>3</sup> Some of these plans may apply to PBGC for financial support through a "partition," and others may pursue plan mergers.<sup>4</sup> Results in this report are based on assumptions regarding the likelihood that additional plans will apply for benefit suspensions and plan partitions in the future. In addition to the plans that are currently in critical and declining status, other plans are projected to run out of money and need financial assistance from the Multiemployer Program over the longer term.

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<sup>2</sup> Based on Form 5500 information and the Critical and Declining Notices filed as of December 2019.

<sup>3</sup> MPRA benefit suspensions are anticipated to be permanent reductions.

<sup>4</sup> As of September 30, 2019, 27 critical and declining plans had made an application for suspension or partition, of which 14 applications were approved for suspension. Three of the 14 also were approved for partition.

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## SINGLE-EMPLOYER PROGRAM

### *Projected Net Financial Position (Assets vs. Liabilities)*

The mean projection shows the net financial position in the Single-Employer Program growing from \$8.7 billion, the actual reported net position as of September 30, 2019, to \$46.3 billion at September 30, 2029 (shown on a present value basis as of September 30, 2019). As noted in PBGC's FY 2019 Annual Report, lower than expected claims and increased premium collections served to improve the position for FY 2019. Thus, the starting point of the projection period is higher for this report than it was for the FY 2018 report.<sup>5</sup> Although the average projected net financial position is positive, risk remains for the Single-Employer Program due to the continued underfunding in some ongoing plans that could potentially become claims to PBGC. Underfunding is more acute in the plans that are most likely to present a claim to PBGC, 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 \$155 billion as of December 31, 2018, per PBGC's FY 2019 Annual Report.

### *Methods and Assumptions*

This year's report incorporates improvements to the Single-Employer Program model. Most significantly, employers' projected pension contribution behavior is now assumed to vary based on the specific circumstances of each plan sponsor in each economic scenario and the key incentives relevant to those circumstances. Additionally, the FY 2019 model reflects updated plan data and economic assumptions. These changes are described in the discussion following **Figure 12**, with additional details about changes in the Appendix. Details regarding the change in projected contribution behavior are available in the **SE-PIMS – Assumptions** section of the Appendix.

## ABOUT THIS REPORT

As required by Section 4008 of ERISA, PBGC's annual Projections Report is an "actuarial evaluation of the expected operations and status of the [Corporation'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 current cash needs) and balance sheet net financial position (assets minus liabilities) for the two programs under a variety of simulated future conditions.

The report generally uses data and assumptions as of September 30, 2019, the end of FY 2019. The projections start with PBGC's FY 2019 Annual Report and forecast results under a range of future economic scenarios for the following 10-year period, without presuming any changes in current law.<sup>6</sup> Assumptions are established as of September 30, 2019. The economic activity since September 30, 2019 has been volatile and uncertain and is not reflected in this report. The effects of the Bipartisan American Miners Act and the Setting Every Community Up for Retirement Enhancement (SECURE) Act of 2019,<sup>7</sup> however, are reflected

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<sup>5</sup> PBGC FY 2019 Annual Report, p. 30.

<sup>6</sup> The financial statements in the Annual Report are 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, 2019 (the end of FY 2019).

<sup>7</sup> Setting Every Community Up for Retirement Enhancement (SECURE) Act of 2019 (Division O of The Further Consolidated Appropriations Act, 2020, Public Law 116-94).

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in this report, even though both were enacted in December 2019. This is consistent with the approach used to reflect the legislated changes to the Multiemployer Program as a result of MPRA.<sup>8</sup> Further, the estimated effects of the Bipartisan American Miners Act, while not known with certainty, will impact the projections of the solvency and future financial condition of the Multiemployer Program.

Since that date, employment and financial markets have experienced significant fluctuations – including initially large gains in domestic equity markets immediately after the end of FY 2019. For example, the return on the Standard & Poor’s (S&P) 500 Index between September 30, 2019, and February 19, 2020, was 14.6 percent. Subsequently, the financial markets and broader economy entered a period of even greater volatility, caused in large part by the novel coronavirus (COVID-19) pandemic.

In recent months, the federal government has worked to restore economic stability and facilitate economic recovery, and the President and Congress have worked together to enact various pieces of legislation to bring relief to American workers and families. As of July 31, 2020, the S&P 500 had more than recovered losses from earlier in the year. In addition, the economy has recovered a significant portion of the job losses from earlier in the year.

Questions have been raised about the effect of COVID-19 on a number of government programs, and PBGC continues to closely evaluate the resiliency of its two insurance programs. Market volatility and economic deterioration associated with COVID-19 are unlikely to have a material effect on the timing of the insolvency of the Multiemployer Program. Economic disruption caused by the pandemic could result in losses in the Single-Employer Program, particularly if unforeseen bankruptcy activity accelerates beyond those companies that were financially troubled prior to the pandemic.

The duration and economic impact of COVID-19 is unknown. Because of the volatility and uncertainty, attempts to estimate how the pandemic could affect PBGC’s insurance programs, measured from an arbitrary point in time after the beginning of the projection period, may present an already outdated or inaccurate picture. The estimates of the economic impact of COVID-19 are not reflected in this report, which generally projects forward from the end of the previous fiscal year.

PBGC uses two stochastic modeling systems to develop the projections: the Multiemployer Pension Insurance Modeling System (ME-PIMS) and the Single-Employer Pension Insurance Modeling System (SE-PIMS). Both systems use distributions of investment returns, interest rates, and other variables to estimate a range of possible future outcomes. The report uses averages and ranges to summarize the results of the 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.
- Equity returns.

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<sup>8</sup> PBGC FY 2014 Projections Report, p. 4.

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- Plan sponsor decisions about contributions.

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 ignored 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 in future outcomes, this report shows a range of results associated with a given set of assumptions. These include the mean (i.e. average) and median (i.e. middle) values, as well as percentile results along the distribution of outcomes. To demonstrate potential variation, the 85th percentile (15 percent of the outcomes are higher [more favorable]), the median value (50th percentile), and the 15th percentile (15 percent of outcomes are lower [less favorable]) are shown. During a 10-year 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 retirement benefits that will be provided by PBGC for the lifetime of participants and their beneficiaries. PBGC’s liabilities are compared to assets to determine a “net financial position.”
- Cash flows, which represent the benefit payments expected to be disbursed by PBGC during each year of the projection period. Cash flows provide a 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. Claims are recorded when the payment of guarantee amounts is “probable.” Claims happen 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 both 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 whose 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).<sup>9</sup>
- 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 benefits for the next year.

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<sup>9</sup> 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.



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Discussions of PBGC's net financial position reflect a comparison of liabilities to assets as of a certain date. The PIMS models estimate liabilities and assets on PBGC's books in the future in different economic scenarios. They do not model possible future losses that are disclosed in footnotes to PBGC's financial statements but not booked as liabilities, such as amounts that represent "reasonably possible" contingencies.<sup>10</sup>

"Benefit payments" in the Single-Employer Program and "financial assistance" in the Multiemployer Program means the amount PBGC is projected to pay to retirees 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 benefit payments/financial assistance and PBGC expenses for a particular year. The 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 financial position but still be solvent for the purposes of 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 SE-PIMS model was updated to reflect expected contribution behavior more directly tied to each plan sponsor's specific circumstances (further details can be found in the **SE-PIMS – Assumptions** section of the Appendix) but otherwise remains predominantly the same as the FY 2018 model. For FY 2019, the ME-PIMS model was updated to reflect the Bipartisan American Miners Act but also otherwise remains largely unchanged from FY 2018. 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.<sup>11</sup>

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 guarantees. This evaluation otherwise assumes no changes to the current law after September 30, 2019, for both multiemployer plans (with the exception of the Bipartisan American Miners Act) and single-employer plans (with the exception of the cooperative and small employer charity (CSEC) plan provisions in the SECURE Act of 2019).

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<sup>10</sup> Reasonably possible contingencies are discussed in Note 9 of PBGC's FY 2019 Annual Report. Measured as of December 31, 2018, they were \$155 billion for the Single-Employer Program and \$11 billion for the Multiemployer Program.

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

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## MULTIEMPLOYER PROGRAM

### MULTIEMPLOYER PROGRAM OVERVIEW

Multiemployer plans are collectively bargained plans maintained by one or more labor unions and multiple companies that are generally in the same industry or members of a trade association. PBGC's Multiemployer Program covers approximately 10.8 million participants in about 1,400 plans and is under severe stress.

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 benefits, PBGC does not take over the administration of the plan. Rather, PBGC provides financial assistance directly to the plan to cover participant guaranteed benefits and plan administrative expenses. This financial help is technically in the form of loans. However, with one exception over PBGC's history, the loans have not been repaid because insolvent plans have not recovered, and they lack any meaningful collateral to support the loans.

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 based solely on participant count. The amount and structure of the benefit guarantees provided under the programs also differ significantly, and the guarantee amount is generally lower for multiemployer plans. Further, assets of the Multiemployer Program are separate from those of the Single-Employer Program, and assets from one program cannot be used to fund obligations of the other program.

### MULTIEMPLOYER PROGRAM SOLVENCY

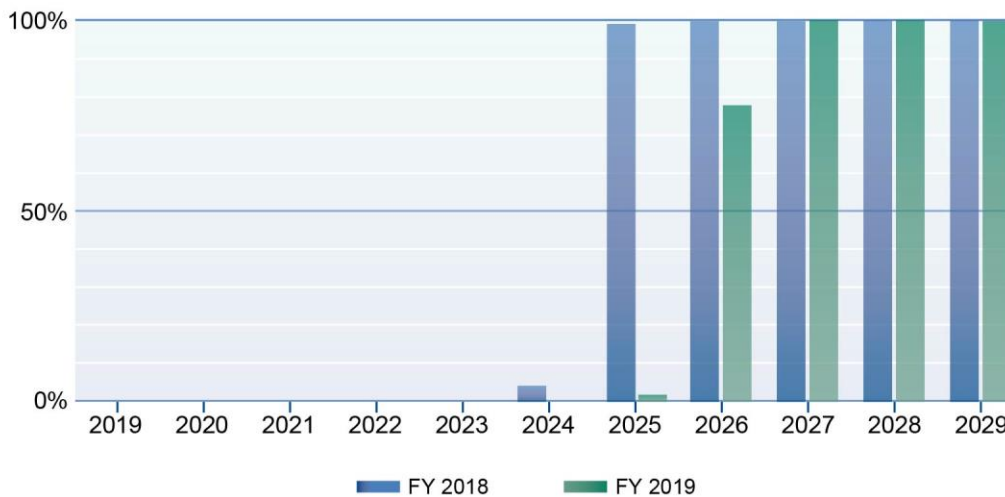
**The Multiemployer Program will run out of money.** Participants in insolvent plans face benefit reductions to the level guaranteed by PBGC upon plan insolvency. They also face an additional risk that PBGC's multiemployer guarantee fund will run out of money to provide financial assistance, leaving PBGC unable to pay the current level of guarantees. By law, no other PBGC assets may be used to provide assistance to multiemployer plans, and PBGC's obligations to failed plans are not backed by the full faith and credit of the United States. Thus, in the absence of legislation to reform the multiemployer pension system or otherwise to address PBGC's Multiemployer Program solvency crisis, the benefits of participants in insolvent multiemployer plans would be reduced to the level that can be supported by PBGC's future premium income. Such reductions could result in some participants receiving a very small fraction of the benefits guaranteed by PBGC.

**No scenario shows the Multiemployer Program remaining solvent beyond FY 2027 under current law.** The projections show that the program is very likely to become insolvent by the end of FY 2026, absent changes in the law, rising to a near certainty by FY 2027. This is later than the projected insolvency year reported in the FY 2018 report, which showed likely insolvency by FY 2025. The primary reason for the change is the recent enactment of the Bipartisan American Miners Act, which provides federal funding for the United Mine Workers Plan. While the amounts of future federal funding for the pension plan are not known with certainty, the projections made using assumptions for this report show that federal funding is likely to keep the United Mine Workers Plan solvent and, thus, not in need of PBGC financial assistance at

least through the 10-year projection period. Other favorable experience during FY 2019, most notably asset returns that were higher than expected, also contributed to the later insolvency year. Compared to prior years' Projections Reports, the likelihood of FY 2024 insolvency is now remote, and there is a small chance of insolvency during FY 2025. The program is most likely to become insolvent in FY 2026.

**Figure 1** compares the results for the prior (FY 2018) and current (FY 2019) insolvency risk projections, absent future changes in the law. In most of the scenarios, PBGC's Multiemployer Program is projected to become insolvent before the end of FY 2026. The Multiemployer Program's projected insolvency is slightly delayed from the insolvency projections made in the prior fiscal year due to the Bipartisan American Miners Act in FY 2019. The likelihood of insolvency does not vary greatly with the expected future use of suspensions and partitions under MPRA.

**Figure 1 – Multiemployer Program Insolvency Risks**



## MULTIEMPLOYER PROGRAM INSOLVENCY TIMING

An illustration of PBGC's multiemployer fund balance, assuming future benefit suspensions or partitions, provides additional insight into the drivers of Multiemployer Program fund insolvency. **Figure 2** compares the assets as of the beginning of the fiscal year to the projected premiums and projected average financial assistance payments for that fiscal year.<sup>12</sup> Assets projected as of the beginning of FY 2025 are anticipated to cover PBGC's obligations for that year. However, as of the beginning of FY 2026, projected assets are significantly less than the anticipated financial assistance payments net of anticipated premiums, illustrating the expected insolvency of the Multiemployer Program fund at some point in that year.

<sup>12</sup> 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).

**Figure 2 – PBGC Multiemployer Fund Assets, Assistance Payments, and Premiums by Fiscal Year**

**Mean Results in Nominal Dollars**



The illustration uses the mean of the projected premiums and the financial assistance payments derived from the simulations. It shows that average projected financial assistance payments rise dramatically over the next 10 years due to the increasing needs of plans that run out of money and become insolvent in the 2020s. Annual financial assistance payments continue to rise more rapidly than premiums in the second decade, when assistance is expected to exceed \$3 billion in every year and continue to grow to above \$4 billion. The Multiemployer Program’s resources, reflected in the premiums line above, will represent only a small fraction of the amount required to pay benefits at current guarantee levels.

The illustration shown in **Figure 2** is similar to Figure 4 in the FY 2018 Projections Report. The primary differences for FY 2019 are the slightly more favorable solvency results due to the enactment of the Bipartisan American Miners Act, which provides federal funding to the United Mine Workers Plan, and favorable FY 2019 asset performance in the multiemployer fund.

For most plans, the projected financial assistance shown remains the average (mean) level of financial assistance from the simulations in each year. For the seven largest plans that are likely to become insolvent prior to FY 2026, the average financial assistance across all simulations has been replaced with a projection of financial assistance payments using the median projection. This approach better simulates the pattern of program outlays in the near term as it approaches insolvency. Adding uncertainty to plan asset returns and other outcomes shifts the pattern of near-term insolvencies forward or back in time depending on the plan. Using the median rather than the average result for near-term insolvencies leads to a somewhat sharper year-by-year adjustment in both financial assistance and assets but does not change the overall pattern shown in prior reports.

Consistent with recent experience, these plans are also assumed to change their plan’s fiscal year as a means of paying full benefits for a partial year before insolvency, and then move to a plan year with benefits paid at

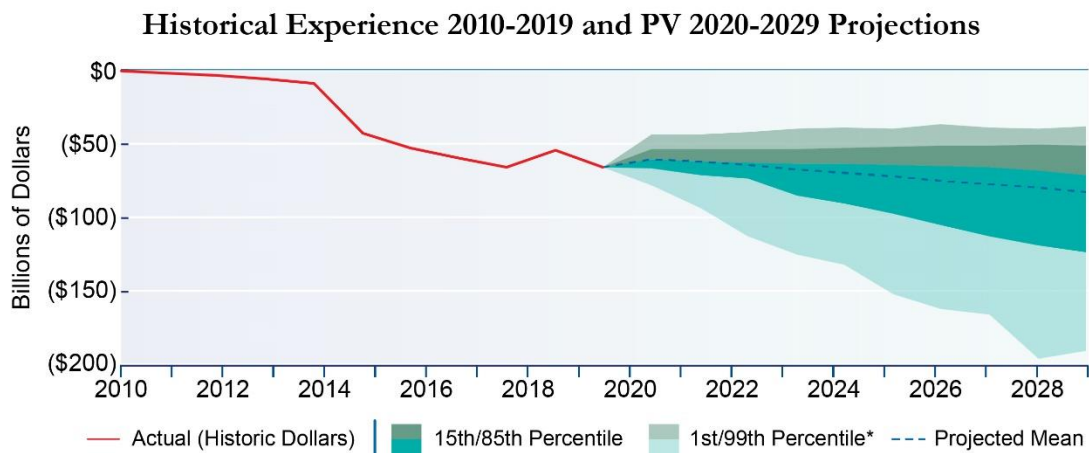
the guaranteed level, avoiding any year with benefits paid at intermediate levels between plan levels and guarantee levels.

## MULTIEMPLOYER SUMMARY PROJECTIONS

PBGC projections continue to show an ongoing decline of the Multiemployer Program’s net financial position, resulting in insolvency during the projection period. As in the past, these projections assume that PBGC maintains its financial assistance at current guarantee levels, even though there is no source of additional resources under current law if assets and premiums are insufficient. The deficit is the present value of future financial assistance, less projected assets, plus any unfunded amounts for prior years carried forward (with interest).<sup>13</sup> The adjustment for unfunded liabilities reflects the current schedule of guarantees and financial assistance in years prior to the projection date.

**Figure 3** shows the actual net financial position for the program for FY 2010 through FY 2019 and selected ranges of projected net financial positions for the following 10 years. The FY 2019 net financial position for the Multiemployer Program was negative \$65.2 billion. The deficit is expected to grow in the future and the uncertainty around the financial position increases, as reflected by the widening cone of results. This year’s mean projected net financial position for FY 2029 is negative \$82.3 billion (expressed as a present value (PV) as of September 30, 2019). The nominal value of the mean projected net financial position for FY 2029 is negative \$100.7 billion.

**Figure 3 – Multiemployer Program Projected Net Financial Position**



\*The 1st/99th percentile range shown excludes outcomes below the 1st percentile and above the 99th percentile.

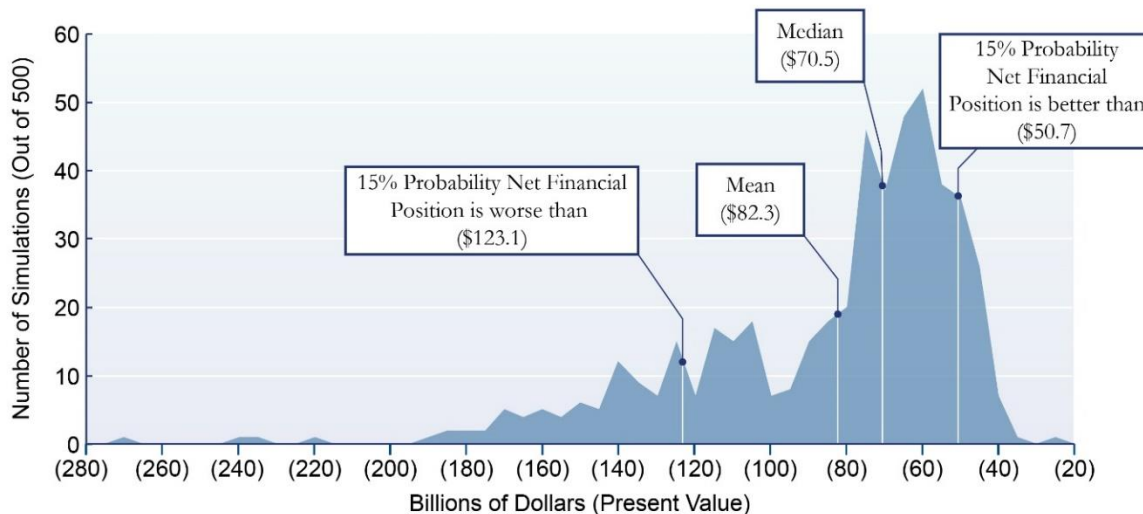
**Figure 4** shows the full range of 500 outcomes projected by the model for PBGC’s Multiemployer Program’s financial position in FY 2029. This includes the scenarios that fall below the 1st percentile and above the 99th

<sup>13</sup> Unfunded amounts carried forward with interest are effectively treated as if PBGC could borrow them. This enables the completion of the present value calculation so that the total liability can be displayed, but it is not intended to imply that PBGC has borrowing authority.

percentile. For each value of PBGC’s projected net financial position along the horizontal axis, the height of the line shows the frequency of that net financial position. Like last year, none of the 500 projections show a positive net financial position.

Plan contributions have not kept pace with new benefit promises and amortizing existing underfunding. When this underfunding is coupled with maturing plan populations, plan deficits are projected to increase. This increases the likelihood of multiemployer plan insolvency.

**Figure 4 – Potential FY 2029 Multiemployer Program Net Financial Position**



Overall, the outcomes in the FY 2019 projections are somewhat worse than the outcomes shown in last year’s projections. The mean, median, and distribution of the FY 2029 net financial position are more negative than the FY 2028 projections reported last year, despite enactment of the Bipartisan American Miners Act. This is primarily due to an approximately 100-basis-point decline in both the projected investment returns and in the projected discount rates from the FY 2018 to FY 2019 reports.

## VARIABILITY IN MULTIEMPLOYER PROGRAM FINANCIAL POSITION

As described above, there is significant uncertainty in the projections of PBGC’s Multiemployer Program. Post-MPRA, there are three major sources of uncertainty in the multiemployer system:

- Probability of new claims.
- Variability in the timing and amount of financial assistance payments.
- Extent to which plans will use suspensions, partitions, and facilitated mergers under MPRA.

The first two are subject to the stochastic modeling process; and their impact on the financial position outcomes is summarized in **Figure 5**, while the third is a behavioral dynamic. These sources of uncertainty are discussed below.

<b>Figure 5 – Variability in 2029 Multiemployer Net Financial Position*</b>			
Present Value at the end of FY 2019 (\$ in billions)			
	<b>Mean</b>	<b>15% - 85% range</b>	<b>1% - 99% range</b>
<b>PBGC net financial position</b>			
<b>1. FY 2019 actual</b>	(\$65.2)	N/A	N/A
<b>2. FY 2029 projected**</b>	(\$82.3)	(\$123.1) - (\$50.7)	(\$189.3) - (\$37.5)
<b>Present value of expected 2019-2029</b>			
<b>3. New claims***</b>	\$41.2	\$10.0 - \$79.8	(\$0.5) - \$144.4
<b>4. Financial assistance payments</b>	\$15.3	\$13.3 - \$17.3	\$11.8 - \$19.1
<b>5. Premiums received****</b>	\$3.6	\$3.6 - \$3.7	\$3.5 - \$3.7

\* Estimates of program deficits and financial assistance shown assume that PBGC will provide financial assistance at the current level of guarantees. As noted previously, PBGC will be unable to provide financial assistance at the current level of the guarantee after the Multiemployer Program becomes insolvent, projected to occur in FY 2026.

\*\* If expressed in nominal terms, the mean projected net financial position for FY 2029 is negative \$100.7 billion.

\*\*\* New claims are the present value of future financial assistance at the time plan insolvency becomes probable.

\*\*\*\* Premiums plus \$2.9 billion in assets as of 9/30/19 are available to pay financial assistance during the projection period.

### *Net New Claims*

Projected new claims arise primarily from plans that are currently in poor financial condition. Net new claims reflects liabilities recorded when a plan is first included in PBGC’s financial statement liability, offset by the value of liabilities removed from the books when a plan’s financial condition improves, and financial assistance is no longer expected to be needed.<sup>14</sup>

Uncertainty about future financial assistance payments reflects the volatility of plans’ investment returns, changes in contributions, and changes to contributions and benefits made by plans approaching insolvency. Contributions to multiemployer plans are determined using a contribution rate, usually for each hour worked by plan participants. When the participant population changes, the contribution amount does too. Contributions may drop significantly in the years before a claim.

<sup>14</sup> This is the present value of net PBGC obligations for plans projected to be booked during the next 10 years, offset by the reversal of liabilities for plans “unbooked” over the 10-year projection period. The liability “unbooked” is the value in the year of removal; it reflects how the liability has evolved over time along a particular economic path and is not the same liability at which the plan was initially booked.

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As shown in **Figure 5** above, the mean present value of net new claims is about \$41.2 billion over the next 10 years. The median present value of net new claims totaled over the next 10 years is \$25.1 billion, indicating that there are some scenarios with very large net claims that pull up the mean value.

The information in **Figure 5** shows that the middle 70 percent of outcomes for the present value of the Multiemployer Program's projected net financial position ranges from negative \$123.1 billion to negative \$50.7 billion, a range of \$72.4 billion.

### *Present Value of Financial Assistance Payments*

ME-PIMS estimates PBGC's financial assistance payments needed by insolvent multiemployer plans to pay retiree benefits at the PBGC guarantee level and to pay plan administrative expenses. PBGC generally provides financial assistance only after a plan becomes insolvent; payments projected over the next 10 years are due to both prior claims (i.e., plans already booked as losses) and future claims from plans projected to become insolvent within the next 10 years. **Figure 5** shows the mean and range of projected financial assistance payments.

Over the period from FY 2019 to FY 2029, financial assistance payments are projected to exceed PBGC's resources. Assets in the Multiemployer Program at FY 2019 are about \$2.9 billion; and the present value of projected premiums over the 10-year period is about \$3.6 billion, totaling about \$6.5 billion in resources. Even in the best scenarios, the expected financial assistance payments are significantly higher than the program's resources. This indicates that PBGC will need substantial additional funds to pay the guaranteed benefits at the current level.

The projected financial assistance payments are higher than in the FY 2018 report because they are one year closer to the projected insolvencies of several large troubled plans. With the passage of time, there is now one less year of small financial assistance payments at the beginning of the projection period and one more year of very large financial assistance payments at the end of the 10-year projection period.

### *Utilization of MPRA Suspension, Partition, and Facilitated Merger*

MPRA gives plans in critical and declining status additional options to address the risk of insolvency. Under MPRA, some plans facing insolvency within the next 20 years may take additional steps to improve long-term solvency, including benefit suspensions. To suspend benefits, plans must be in critical and declining status and apply to Treasury for approval of the benefit suspensions. The application must meet a number of conditions, including demonstrating that (1) the proposed benefit suspensions will avoid plan insolvency; (2) benefit reductions are equitably distributed among plan participants; and (3) the plan's trustees have taken all reasonable measures to avoid insolvency, and have provided notice to participants describing the proposed suspensions. In addition, a vote by participants must be held on the proposed reductions.

The ME-PIMS model estimates plan participant demographics and a benefit distribution for each plan. That information is used to project assets and liabilities and to determine, at each point along each economic path, (1) whether the plan is in critical status; (2) if the plan is projected to become insolvent within the ensuing 20-



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year period and meets the criteria to be in critical and declining status<sup>15</sup>; (3) the amount of benefits protected under MPRA; and (4) whether plans that would otherwise be projected to be insolvent would be projected to be solvent long-term if approved for either benefit suspensions alone or partition assistance. For critical and declining status plans, ME-PIMS then applies assumptions as to whether a plan’s board of trustees will undertake and successfully complete the requirements of benefit suspension and partition (if needed).

The degree to which eligible plans will apply for and implement benefit suspensions is within the complete discretion of each plan’s trustees. Modeling this behavior is particularly uncertain due to limited experience. At the end of FY 2019, 14 plans have implemented benefit suspensions (including three with partitions). These 14 plans are reflected in the FY 2019 results. As of June 2020, 29 plans had applied for benefit suspensions (including five with partitions).

The assumptions for these future benefit suspensions reflect two primary factors: whether a plan’s board of trustees will apply for a suspension that meets the requirements for approval by the Treasury under MPRA and, if a plan is not “systemically important,” whether participants will vote to override the suspension. For “systemically important” plans whose applications are approved by Treasury, the law requires that Treasury implement either the proposed suspension or a modified version of the proposed suspension, notwithstanding the results of the participant vote.<sup>16</sup>

This report continues to assume a zero percent likelihood that the largest critical and declining plan will suspend benefits, a 30 percent likelihood that other plans will apply for suspension, and a 10 percent likelihood that other plans will apply for both suspension and partition.

## MULTIEMPLOYER RECONCILIATION FROM FY 2018 TO FY 2019

**Figure 6** provides a detailed reconciliation of the changes from FY 2018 to FY 2019. ME-PIMS projects that the present value of PBGC’s FY 2029 multiemployer obligations will be significantly higher than last year’s projections – a mean present value deficit of \$82.3 billion for FY 2029 compared to the previous projection of a mean present value deficit of \$66.2 billion for FY 2028, an increase of \$16.1 billion.

The 10-year projections show the Multiemployer Program’s net financial position deteriorated from last year’s projections. This is primarily due to a decrease in the discount rates that are used to convert future financial assistance cashflows to a present value. Projected future financial assistance also increased due to lower asset return assumptions for the full universe of multiemployer plans, resulting in earlier and larger projected insolvencies. These increases were partially offset by the projected effects of the Bipartisan American Miners Act on the solvency of the United Mine Workers Plan.

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<sup>15</sup> Under MPRA, plans in critical status must perform either 15- or 20-year projections to determine whether they will become insolvent, qualifying as “critical and declining.” The 20-year test applies if the plan is less than 80 percent funded or has a ratio of inactive to active participants of more than 2 to 1; it is rare for a plan to be in critical status if one of these conditions does not apply.

<sup>16</sup> Under the statute, a plan is “systemically important” if, absent the suspensions, it would be projected to need more than \$1 billion (indexed with the National Average Wage Index after 2014) in financial assistance from PBGC. In 2020, the indexed amount is \$1,135,000,000.

**Figure 6 – Reconciliation of Changes in Multiemployer Results**

Present Value at the end of FY 2019 (\$ in billions)

<b>1.</b> FY 2028 Mean Net Financial Position from FY 2018 Projections Report	(\$66.2)
<b>2.</b> Passage of Time	<u>(2.8)</u>
<b>3.</b> Expected Year 2029 Mean Net Financial Position [(1) + (2)]	(\$69.0)
<b>4.</b> Changes	
a) New Plan Data	\$5.8
b) Economic Assumptions	(24.1)
c) Model Improvements	(1.0)
d) Legislative Changes	<u>\$6.0</u>
e) Total Changes	(\$13.3)
<b>5. FY 2029 Mean Net Financial Position [(3) + (4e)]</b>	<b>(\$82.3)</b>
<b>6.</b> Adjustment from Present Value to Nominal Value	(\$18.4)
<b>7. Nominal Value of FY 2029 Mean Net Financial Position [(5) + (6)]</b>	<b>(\$100.7)</b>

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

**Passage of Time.** The FY 2018 report projected PBGC’s net financial position in FY 2028 and presented the results valued in 2018 dollars. To compare with the FY 2019 report, which projects to FY 2029 with values reported in 2019 dollars, the FY 2018 projections are rolled forward to project one additional year with one less year of discounting. In addition, the FY 2019 projection includes one additional year of projected new insolvencies compared to the FY 2018 projection (i.e., those in FY 2029, are projected to become insolvent through FY 2039, whereas the FY 2018 projection only includes projected insolvencies through FY 2038). The effect of the roll forward is a deterioration of \$2.8 billion in the projected net financial position.

**New Plan Data.** Changes in the starting data between FY 2018 and FY 2019 reflect new plan data provided on plans’ Forms 5500.<sup>17</sup> This includes higher-than-expected returns on assets and changes in participant data and contributions. Use of the updated data improves the projected net financial position by \$5.8 billion.

**Economic Assumptions.** The different economic climate in FY 2019 compared to FY 2018 results in changes to the economic assumptions upon which all the ME-PIMS projections are based. Because interest rates declined by about 100 basis points, expected returns on assets are reduced, which increases projected future financial assistance. Because future financial assistance is paid well into the future, the present value is highly sensitive to interest rates, and the present value of the assistance increased significantly due to the

<sup>17</sup> Information about Form 5500 and its attachments is available at <https://www.dol.gov/agencies/ebsa/key-topics/reporting-and-filing/form-5500>.

lower interest rates. Reflecting these changes further reduces the projected net financial position by \$24.1 billion.

**Model Improvements.** Various minor improvements were made to the ME-PIMS model in conjunction with this report. These modifications include (1) determining separate partition percentages for vested terminated participants and retirees and (2) more precisely estimating benefit payments for inactive participants. The combined effect of these changes reduced the projected net financial position by \$1.0 billion.

**Legislative Changes.** This year’s model reflects the enactment of the Bipartisan American Miners Act, which provides federal funding for the United Mine Workers Pension Plan. The future amounts of that federal funding are not known with certainty but are projected to prevent the plan’s near-term insolvency. The amounts of future federal funding available for the United Mine Workers Pension Plan are dependent on several factors, including the amounts needed each year by certain United Mine Worker retiree health plans. Using estimates of the amounts of federal funding provided by the Office of Management and Budget (OMB) for the United Mine Workers Pension Plan shortly after enactment in December 2019, the legislation improves PBGC’s projected net financial position by \$6.0 billion. See the **ME-PIMS – Assumptions** section of the Appendix for more details, including analysis of the sensitivity of the PBGC’s projected FY 2029 net financial position to lower future federal transfers to the United Mine Workers Pension Plan.

**SENSITIVITY OF CHANGES TO THE MULTIEMPLOYER MODEL**

*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 2019, but the rate used to discount the projected FY 2029 net position back to 2019 is not changed for this sensitivity analysis.

Figure 7 – Sensitivity to Discount Rate Changes in Multiemployer Results			
Present Value at the end of FY 2019 (\$ in billions)			
	+50 Basis Points	Baseline	-50 Basis Points
FY 2029 Multiemployer Net Financial Position	(\$76.2)	(\$82.3)	(\$89.4)

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 2029 Multiemployer Program net financial position would improve by \$6.1 billion. Discount rates 50 basis points lower would further deteriorate the deficit by \$7.1 billion in FY 2029. See Appendix for more details.

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PBGC also publishes other sensitivity tests of the model on the PIMS page on PBGC's website.<sup>18</sup>

### *Future Wage Index*

PBGC's primary assumption on future wage growth is derived from the intermediate assumption of the Social Security Administration projection assumptions. Using an alternative lower wage growth assumption derived from the Social Security Trustees' high-cost assumption results in the mean present value of the FY 2029 multiemployer deficit increasing by \$1.4 billion to \$83.7 billion.

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<sup>18</sup> The PIMS page is available at <https://www.pbgc.gov/about/projections-report/pension-insurance-modeling-system>. Links to sensitivity test memos are included under the column labeled "Information About PIMS."

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## 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 program covers about 25 million participants in about 24,000 pension plans. The program's financial status has evolved from very recent deficits to a positive net financial position projected to grow over the next 10 years. The improved net financial position is due primarily to low claims activity and increasing premium revenue. Higher premium revenue has resulted from higher premium rates, especially from plans that have underfunded vested benefits subject to the variable rate premium. Despite the projected improvement in the program's financial position, significant risk of higher claims remains.<sup>19</sup>

The information in this report starts with PBGC's existing assets and liabilities as of FY 2019. SE-PIMS is used to project:

- Future premium income.
- Assets and liabilities for single-employer plans which may become future PBGC claims that 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 SUMMARY PROJECTIONS

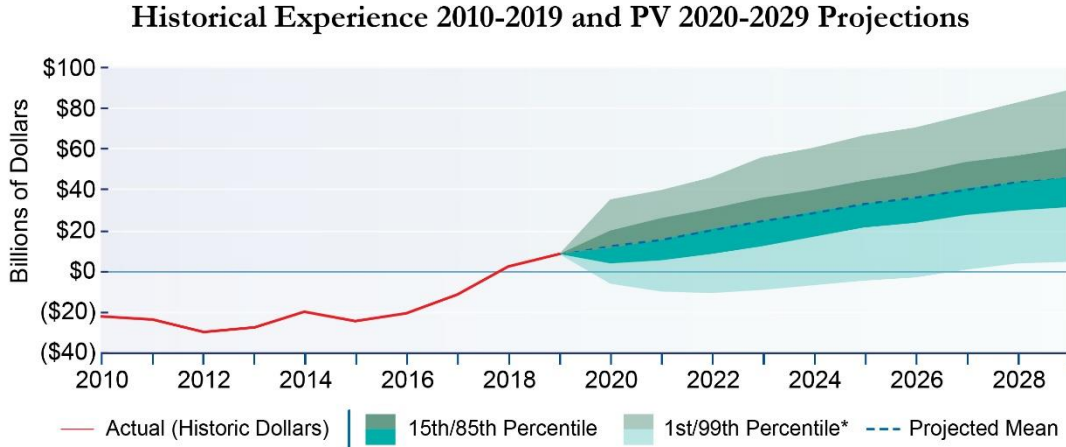
The projections show that the Single-Employer Program net financial position is likely to continue to improve. This is similar to the pattern reported last year.

**Figure 8** shows PBGC's actual net financial position for FY 2009 to FY 2019, and selected ranges of projected net financial positions for the next 10 years. As shown in the FY 2019 Single-Employer Program financial statements, assets of \$128.1 billion and liabilities of \$119.4 billion result in a positive net financial position of \$8.7 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 financial position is \$46.3 billion in FY 2029, an increase of \$19.6 billion from the comparable numbers in the FY 2018 report. Expressed in nominal terms, the mean projected net financial position in FY 2029 is \$57.7 billion.

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<sup>19</sup> The Single-Employer Program's loss exposure to reasonably possible terminations (such as underfunded plans sponsored by companies with credit ratings below investment grade) was \$154.7 billion in FY 2019. See PBGC FY 2019 Annual Report, p. 91.

**Figure 8 – Single-Employer Program Projected Net Financial Position**

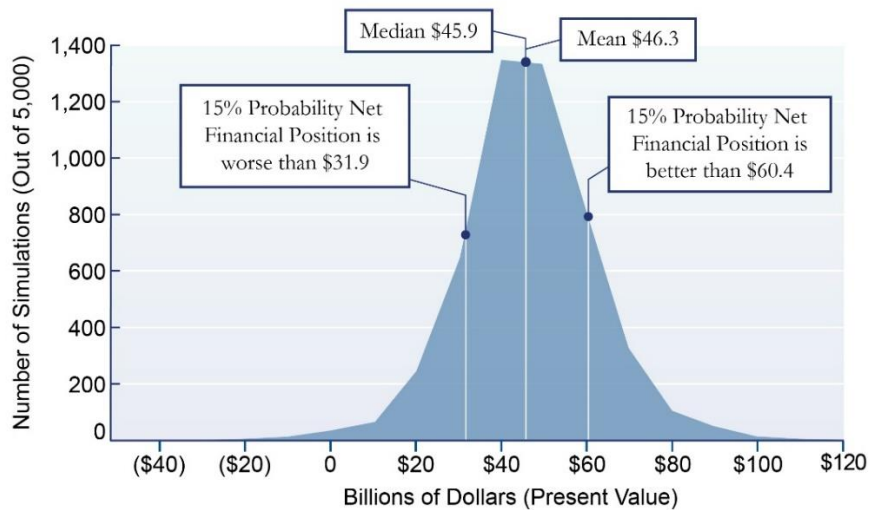


\*The 1st/99th percentile range shown excludes outcomes below the 1st percentile and above the 99th percentile.

The projected improvements to PBGC’s net financial position over the 10-year period are due to a general trend of improving plan funding in single-employer plans and projected PBGC premiums exceeding projected claims.

**Figure 9** shows the full range of the 5,000 outcomes projected by the model for PBGC’s Single-Employer Program’s financial position in FY 2029. This includes the scenarios that fall below the 1st percentile and above the 99th percentile. For the Single-Employer Program, there are a few scenarios that result in a negative net financial position. For each value of PBGC’s projected net financial position along the horizontal axis, the height of the shaded area shows how many paths have that net financial 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 9 – Potential FY 2029 Single-Employer Program Net Financial Position**



Vertical lines on the graph show the present value of PBGC's projected FY 2029 net financial position at the 15th and 85th percentiles and the mean and median values of projected net financial positions. The median is a \$45.9 billion positive net financial position in FY 2029, while the mean is a \$46.3 billion positive net financial position. The potential range of results on the FY 2029 net financial position goes from negative \$32.0 billion to \$119.8 billion. Although the majority of outcomes result in a positive net financial position, the negative outcomes show the tail risks in the Single-Employer Program.

## VARIABILITY IN SINGLE-EMPLOYER FINANCIAL POSITION

As described above, there is significant uncertainty in PBGC's Single-Employer Program projections. **Figure 10** 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 2029 net financial position. The considerations related to each factor are explored in the rest of this section.

Figure 10 – Variability in 2029 Single-Employer Net Financial Position			
Present Value at the end of FY 2019 (\$ in billions)			
	Mean	15% - 85% range	1% - 99% range
<b>PBGC net financial position</b>			
1. FY 2019 actual	\$8.7	NA	NA
2. FY 2029 projected*	\$46.3	\$31.9 - \$60.4	\$4.8 - \$88.8
<b>Present Value of expected 2019-2029</b>			
3. New claims incurred	\$15.2	\$4.8 - \$26.0	\$1.1 - \$55.3
4. Asset/Liability gain	\$6.0	(\$12.0) - \$22.9	(\$31.5) - \$57.2
5. Premiums received	\$46.8	\$30.0 - \$64.2	\$22.6 - \$87.3

\* If expressed in nominal terms, the mean projected net financial position for FY 2029 is \$57.7 billion.

### *Financial Position*

**Figure 10** shows the present value of estimates of PBGC's net financial 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 that is expected to increase when plan underfunding increases, 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 2029 varies by \$28.5 billion (discounted to September 30, 2019).

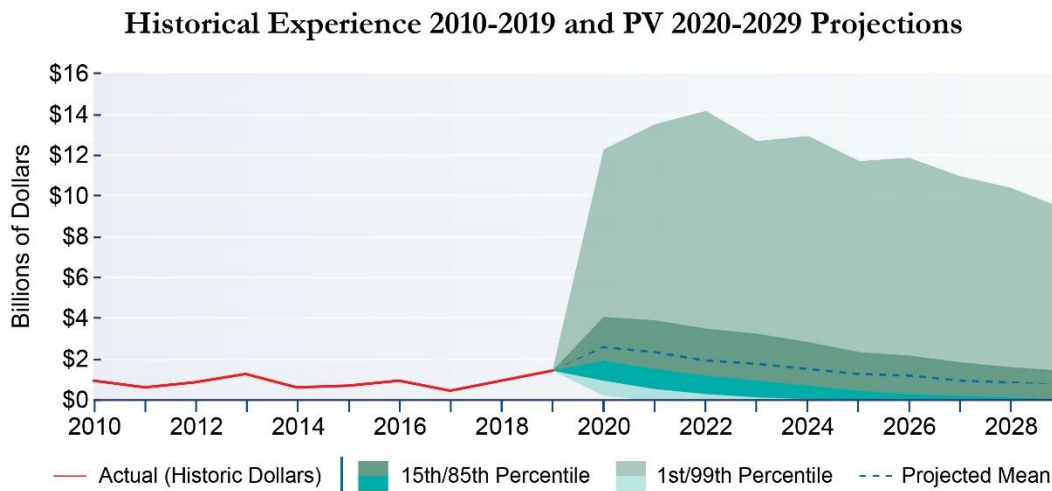
### *Bankruptcy and New Claims*

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 (up to the

legal limit) that PBGC is expected to pay over the value of the plan’s assets and any recovery from the sponsoring firm. There is no claim if plan assets are sufficient to cover future benefit payments up to the level of PBGC guarantees or if a plan sponsor can continue to maintain its plan. A “new claim” is the claim for a plan that was not included in the most recent financial statements.<sup>20</sup> **Figure 10** shows the mean and the range of outcomes for new claims.

In **Figure 11**, the inner cone around the projected mean represents the range of outcomes between the 15th to 85th percentiles while the full cone represents the 1st to 99th percentile level of claims.<sup>21</sup> 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 very high level of claims at the 99th percentile is related to economic crisis scenarios where both the level of bankruptcy and the amount of pension underfunding increase significantly at around the same time.

**Figure 11 – Single-Employer Program Net New Claims**



**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 primarily 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.

A small portion of assets is invested in a portfolio of fixed income and equity investments with the objective of achieving higher returns. PBGC’s investment policy operates to reduce the return-seeking portion of assets

<sup>20</sup> No specific determination of “probable” claims is included in the projections.

<sup>21</sup> 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, 2019, 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).



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as PBGC's net financial position improves (i.e., a "glidepath" approach). PBGC's assets are invested mostly in fixed income investments in order to mitigate much of the interest rate risk in PBGC's liabilities. 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 be offset by decreases in the value of PBGC's liabilities.

**Figure 10** shows the asset-liability gain, which is 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 \$22.9 billion gain to a \$12.0 billion loss in the 15th to 85th percentiles, expressed as present values discounted to 2019.

### *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 due to certain events such as drops in interest rates or investment losses.

Variable rate premiums are a significant factor motivating the amounts of plan sponsors' contributions to their pension plans. The assumption in SE-PIMS for contributions from single-employer plan sponsors has reflected this incentive for many years but has adjusted contributions in a uniform way for all plan sponsors. For the FY 2019 report, each plan sponsor's projected contribution is based on its plan's funded status in each economic scenario. The new assumption recognizes that some plans remain underfunded and pay a variable rate premium despite the financial incentive to fund at a higher level and reduce the PBGC premium. This new assumption results in higher projected premium income compared to the prior assumption. In recent years, variable rate premiums have provided substantially more revenue to PBGC than fixed-rate premiums, but because plans are assumed to gradually become better funded, variable premium revenue is expected to trend down during the projection period.

Even though additional premium revenue improves PBGC's net financial position, higher variable 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 financial position. The combined effect of the investment strategy and premium structure helps dampen volatility and mitigate risks in the Single-Employer Program.

## SINGLE-EMPLOYER RECONCILIATION FROM FY 2018 TO FY 2019

**Figure 12** provides a detailed reconciliation of the projection results due to changes in the model and data from FY 2018 to FY 2019. The mean projected position at the end of the projection period has improved by about \$19.6 billion, to a present value of projected net financial position of \$46.3 billion. The change results primarily from updated data and improvements to the SE-PIMS model.

<b>Figure 12 – Reconciliation of Changes in Single-Employer Results</b>		
Present value at the end of FY 2019 - (\$ in billions)		
<b>1.</b>	FY 2028 Mean Net Financial Position from FY 2018 Projections Report	\$26.7
<b>2.</b>	Passage of Time	<u>\$2.8</u>
<b>3.</b>	Expected Year 2029 Mean Net Financial Position [(1) + (2)]	\$29.5
<b>4.</b>	Changes	
	a) New Plan, Sponsor, and PBGC Data	\$5.2
	b) Economic Assumptions	\$2.3
	c) Model Improvements	\$10.7
	d) Legislative Changes	<u>(\$1.4)</u>
	e) Total	\$16.8
<b>5.</b>	<b>FY 2029 Mean Net Financial Position [(3) + (4e)]</b>	<b>\$46.3</b>
<b>6.</b>	Adjustment from Present Value to Nominal Value	\$11.4
<b>7.</b>	Nominal Value of FY 2029 Mean Net Financial Position [(5) + (6)]	\$57.7

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

**Passage of Time.** The FY 2018 report projected PBGC’s net financial position in FY 2028 and presented the results valued in 2018 dollars. To compare with the FY 2019 report, which projects to FY 2029 with values reported in 2019 dollars, the FY 2018 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 \$2.8 billion in the projected net financial position.

**Plan, Sponsor, and PBGC Data.** Between the FY 2018 and FY 2019 Annual Reports, PBGC’s net financial position improved from \$2.4 billion to \$8.7 billion. This is a larger one-year improvement in PBGC’s net financial position than was projected with FY 2018 SE-PIMS, primarily due to lower claims and higher premiums than expected. Additionally, updated single-employer plan data results in both claims and premiums being projected at higher levels than were projected last year. The combination of these updates improves the projected net financial position by \$5.2 billion.

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**Economic Assumptions.** Long-term interest rates fell by over 100 basis points since the starting point of last year’s projections. This increases estimated liability values and decreases expected future investment returns in the model. Both effects result in lower plan funding levels and, in turn, increase projected claims. However, projected variable rate premium revenue also increases and more than offsets the higher claims cost. The net effect of these changes further increases the projected net financial position by \$2.3 billion.

**Model Improvements.** Plan sponsors’ assumed contribution behavior has been updated to reflect their specific circumstances in each economic scenario and the key incentives relevant to those circumstances. The new contribution assumption is based primarily on three key incentives: (1) making minimum required contributions; (2) reducing variable rate premiums (VRPs); and (3) maintaining desired levels of funding often based on pension liability measurements used in corporate financial accounting. The prior version of SE-PIMS used the first two incentives, but the updated assumption adjusts the percentage of plan sponsors using each of these incentives based on the VRP rate. As premium rates increase, more plan sponsors are assumed to make contributions with the objective of reducing their premium payments. The effect of the VRP per participant cap is considered in determining the VRP rate assumed to drive plan sponsor behavior. The cap is a primary reason that some plan sponsors may continue to pay VRPs as the VRP rate continues to rise, because plans over the cap are less affected by future premium increases. The third incentive does not have a significant impact on the projection results since it is associated primarily with plans that have eliminated the VRP by fully funding the plan’s PBGC vested benefit liability (VBL).

Plan sponsors funded below 80 percent on a Pension Protection Act of 2006 (PPA) basis are assumed to fund with the objective to eliminate restrictions on benefits.<sup>22</sup> For plan sponsors that experience bankruptcy in the projections, contributions for the three years prior to bankruptcy are reduced to zero, even if no credit balance is available, to represent the conservation of cash in a financially distressed business. Overall, the new assumption better represents the impact on premiums of both plans with significant VBL underfunding and those that maintain high levels of funding. Relative to the assumption used in previous projections, this approach results in lower contributions from plans that have not fully funded PBGC’s VBL, resulting in higher projected VRPs. The new contribution assumption does not have a significant impact on projected claims. More detail on this assumption is available in the **SE-PIMS – Assumptions** section of the Appendix.

Other changes made to the modeling system include improving data on valuation rates used to value liabilities for VRP calculations and refinements to projections of plan participants’ retirement and mortality rates, and improvements to the modeling of amortizations of plans’ gains and losses. These also include minor assumption changes. The impact of these additional changes to the projected net financial position was minimal.

The combined effect of these changes increases the projected net financial position by \$10.7 billion.

**Legislative Changes.** Section 206 of the Setting Every Community Up for Retirement Enhancement (SECURE) Act of 2019 (Division O of The Further Consolidated Appropriations Act, 2020, Public Law 116-

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<sup>22</sup> PPA basis is the measure of assets and liabilities used to determine the Adjusted Funding Target Attainment Percentage (AFTAP). Liabilities are measured based on prescribed segment rates or a full yield curve. Assets may be smoothed. PPA basis reflects the original PPA law plus provisions of subsequent funding relief legislation - the Workers Relief and Employer Recovery Act of 2008 (WRERA), Pension Relief Act of 2010 (PRA), Moving Ahead for Progress in the 21st Century Act (MAP-21), Highway and Transportation Funding Act of 2014 (HATFA), and Bipartisan Budget Act of 2015 (BBA).

94) set lower PBGC premium rates for cooperative and small-employer charity (CSEC) plans. Implementing this provision in the model results in decreases in projected premiums and decreases the projected net financial position by \$1.4 billion.

## RECENT SINGLE-EMPLOYER PLAN TRENDS

The projections do not assume that plans are terminated voluntarily by healthy companies, only by companies in distress. However, some healthy companies do close their pension plans by purchasing annuities, paying lump sums to participants, and undertaking a standard termination. In these cases, PBGC’s current obligations are not affected, risk of a future claim is eliminated, and those companies cease paying premiums. PBGC will continue to monitor the effect of these actions and the implications for the model.

In addition to standard terminations, some plan sponsors have reduced the size of their plans through annuity purchases and lump sum “windows,” which are not modeled in SE-PIMS. In addition to reducing premium income, these transactions could reduce PBGC’s exposure and the size of future claims. PBGC continues to gather data on these transactions from premium filings and has performed testing of the sensitivity of the SE-PIMS model to these trends.<sup>23</sup> PBGC intends to continue its investigation of this trend and the implications for the model.

## 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 2019, but the rate used to discount the projected FY 2029 net position back to 2019 is not changed for this sensitivity analysis.

Figure 13 – Sensitivity to Discount Rate Changes in Single-Employer Results			
Present Value at the end of FY 2019 (\$ in billions)			
	+50 Basis Points	Baseline	-50 Basis Points
FY 2029 Single-Employer Net Financial Position	\$49.8	\$46.3	\$42.4

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 2029 Single-Employer Program net financial position would improve by \$3.5 billion. The likelihood of a positive net financial position of the Single-Employer Program in FY 2029 would increase from 99.4 percent to 99.8 percent. Discount rates 50 basis points lower would decrease the mean present value of the net financial position by \$3.9 billion and reduce the likelihood of a positive net financial position in FY 2029 to 98.3 percent. See Appendix for more details.

<sup>23</sup> See <https://www.pbgc.gov/sites/default/files/derisking-sensitivity-economic-downturn-stress-test-fy-2017.pdf>

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## 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, 2019.

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, Jarred Scott, am an actuary of PBGC's Policy, Research and Analysis Department (PRAD). I am an Associate 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*  
*Member, American Academy of Actuaries*



Jarred Scott, ASA, EA  
*PIMS Division Manager, Policy, Research and Analysis*  
*Department, PBGC*

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## APPENDIX

### OVERVIEW OF PIMS

The analysis in this report uses ME-PIMS and SE-PIMS. The PIMS models are primarily models of pension plans, rather than of plan participants. 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 is predictive. ME-PIMS reflects anticipated employer behavior through contribution rate assumptions related to zone status. It does not anticipate withdrawal by individual employers. SE-PIMS does not attempt to anticipate companies' more general behavioral responses to changed circumstances, such as whether to continue to sponsor defined benefit plans.

#### *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 2019), but shows nominal values in certain figures. Results are explicitly noted as expressed in nominal or present value terms. Present values are higher when interest rates are low 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 PBGC's most recent 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 do not explicitly determine liabilities for plans which are "probable for financial assistance" (multiemployer) or are "probable to terminate" (single-employer).

#### *Capital Market Assumptions*

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

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**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. The Treasury yield for a given period is expected to be equal to the yield for the prior period, plus or minus a randomly generated amount.
- The random draws affecting the bond yields and stock returns are correlated according to an estimate derived from the period 1973 to 2007.<sup>24</sup> 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.

**Asset Allocation.** A single representative asset allocation is assumed for all plans, based on an internal study of historic asset returns among large plans. Using the financial rates directly modeled in PIMS (stock market returns, long-term Treasury bond returns and yields), the study estimated mixtures of those rates to best fit the historic returns of plans in the study. PIMS uses the following weighting: 48 percent stock market returns, 23 percent long-term Treasury bond returns, and 30 percent long-term Treasury bond yields. Returns are adjusted down by 2.5 basis points (percentages are rounded).

## ME-PIMS

### *ME-PIMS — Overview*

Each year, in preparing its financial statements, 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 insurance program. In determining whether a plan should be classified as a probable risk of requiring financial assistance in the future and recorded in PBGC's financial statements as a balance sheet liability, PBGC evaluates whether the plan can be expected to become insolvent within the following 10 years, often taking into account detailed available plan and industry data. Each plan is determined to either be "booked" as a liability for the financial statements for a given year or not to be included in the accrued liabilities at all.

In the Multiemployer Program, a probable liability is generated (and booked on PBGC's financial statements) when cash-flow insolvency is projected 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.

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<sup>24</sup> This assumption has been subsequently reviewed by PBGC; it was determined that the estimate derived in that time frame is still representative of current correlation rates.

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## *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.

For 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, and assumptions from the closest match to the 25th percentile, the 75th percentile, or median active-to-inactive ratio.
- The set of sample plans and the closest matches remain unchanged from the prior year to avoid volatility.

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

Data is reviewed for outliers and missing fields. Data on critical and declining zone status plans receives special scrutiny, and Form 5500 information is extended with filed participant notices and other information available to PBGC.

For booked plans, PBGC collects additional data, which is subject to confidential treatment requests under 29 CFR 4901.24.

## *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 multiemployer simulations.

In each simulation, the model generates 50-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 one percent of contribution formula or the removal of early retirement subsidies upon critical status) and active population changes.



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There is typically a long time-lag between PBGC's booking of a multiemployer plan and the start of PBGC's financial assistance payments. Payments 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 economic conditions improve 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 initial recognition.

ME-PIMS reflects un-bookings as negative claims, which are considered in the mean and median claim amounts. However, financial improvements during the projection period that are insufficient to cause claims to be un-booked are not reflected in the un-booked ME-PIMS claims values. As a result, the change in net financial position over the projection period may fall short of the amount that would be determined when reflecting the present values of simulated premiums, financial assistance, expenses, and investment returns over that period.

The median level of claims is used, rather than the average, for the seven largest plans that are likely to become insolvent prior to FY 2026. This approach better simulates the pattern of program outlays as it approaches insolvency. Using the median result for near-term insolvencies leads to a somewhat sharper year-by-year adjustment in both financial assistance and assets.

To mitigate the modeling and methodological differences between the model used for financial reporting and ME-PIMS, a scale factor is applied to the extent necessary to match the multiemployer liability reported in PBGC's Annual Report. The scale factor used for the FY 2019 Projections Report is 0.975.

### ***ME-PIMS — Plan Sponsor Behavior***

Multiemployer funding rules create situations where plans may make decisions or alter their behavior based on funded status, projected insolvency, or other conditions. These behavioral adaptations are modeled to some 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 have "exhausted all reasonable measures" (ERM). All critical and declining status plans are assumed to have ERM for FY 2019.

The model also reflects the suspension of benefits and partition of critical and declining plans, based on the financial status of each sample plan along each modeled economic path. Plans that are critical and declining at any point in the projection are assumed to make a one-time decision whether to apply for suspensions and partitions based on the assumptions regarding partition and suspension probabilities.

To determine whether a plan will need suspension or partition assistance at any point in the projection, ME-PIMS uses the imputed plan cash flows to calculate benefits at the maximum suspension level (110 percent of PBGC's guarantee, with estimated additional protections for aged and disabled participants). If the suspension reduction is enough to achieve long-term solvency, the plan election will be for suspension-only or no changes (depending on a random-number draw). If the suspension is inadequate, the plan is further processed to determine whether an election for suspension plus partition will be modeled.

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For a suspension-only plan, the maximum suspensions are adjusted using aggregate cash flows to calculate benefit levels just high enough to achieve long-term solvency over 30 years. The requirement for longer-term solvency is modeled on a simplified basis by requiring a funding ratio of at least 20 percent at the end of 30 years. ME-PIMS includes a suspension “re-test.” Suspended plans are retested every five years to determine if the suspension percentage can be modified. The model increases the suspension percentage if a plan is projected to be insolvent due to financial deterioration. Should the financial condition of a plan improve or deteriorate, the model will allow a maximum of 50 percent of the change in the suspension percentage to be implemented. For this suspension retesting process, a more conservative asset return of four-and-a-half percent is used. These conditions are added to minimize issues related to plans going in and out of suspensions during the projections.

For a “suspension plus partition” plan, the benefits are reduced to the maximum suspension level, and the amount of partition assistance required is determined to maintain solvency. If the present value of partition assistance required is less than the present value of future assistance by more than a de minimis amount, assuming no partition occurs, the plan is assumed to pass MPRA’s expected long-term loss test (see ERISA §4233(b)(3)(A)). Should the plan meet these requirements, it is then modeled as electing between suspension and partition or no changes. Plans projected to receive a partition remain in the partition status throughout the projections.

ME-PIMS does not separately model other forms of financial assistance such as facilitated merger assistance. Since they are subject to similar limits on plans (except the requirement for maximum suspensions), they are modeled as part of the potential partition universe. Given MPRA’s impairment tests (see ERISA §4233(b)(4) and §4231(e)(2)(c)), the effect on PBGC outcomes is likely similar whether financial assistance is provided through facilitated merger or partition.

### ***ME-PIMS — Cash Flow Development***

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

Active participant scatters and decrement assumptions were collected for about 300 plans for the FY 2019 report. The model utilizes this data to simulate active census data for the remaining multiemployer plans based on industry and the percentile position of active-to-inactive ratio. Cash flows for active participants 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 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 versus in-pay retirees and beneficiaries.

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## *ME-PIMS — Assumptions*

The following variables are stochastically projected:

**Plan Demographics.** Starting with the plan's active employee 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 (or not) to bring the size of the active population up to the size indicated by the continued trend as needed after plan decrements (retirement, termination of employment, disability) take place.

ME-PIMS does not currently assume industry-specific employment trends. For all but critical and declining plans, the model incorporates annual variability assumptions, resulting in a mean net decrease in the active multiemployer population of 1.3 percent per year across all simulated paths. The annual active population decline assumption for critical and declining plans is set to zero percent in order to align with the level future contribution assumption used for programming simplification.

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

**Mortality.** Mortality uses the RP-2014 Combined Healthy table, projected to 2032 with the MP-2016 improvement scale.

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

**Per Capita Contribution Rate Increases.** The primary annual per capita contributions increase is based on the historical increase rate observed between 2009 and 2017. The annual estimated per capita contribution growth rate is as follows:

- Green Zone (Neither Endangered nor Critical) Plans – The most recent historical per capita growth rate will phase down over 15 years to the wage growth assumption.
- Yellow Zone (Endangered) Plans – Implement a funding improvement plan that includes a maximum of 12 percent increase in per capita contribution growth for up to 10 years. Per capita contribution growth is lowered to inflation after 10 years.
- Red Zone (Critical) Plans – Implement a rehabilitation plan that includes a maximum of 7 percent increase in per capita contribution growth for up to 15 years (including up to 10 years of increases in yellow zone, if applicable). Per capita growth is lowered to inflation after 15 years.
- Critical and Declining Plans – Annual per capita contribution growth is assumed to remain level.

The per capita contribution rate is further limited to a multiple of the 2009 per capita rate – 1.5 times for critical and declining status or ERM plans and three times for other plans but not less than the current per capita contribution rate.

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**Benefit Improvements.** For green zone plans with a flat dollar benefit formula, benefit improvements are made by amendment to track changes in wages over time. For green zone plans with a percent of contribution formula, no past service benefit improvements are assumed.

**Benefit Improvement Restriction.** Critical status and endangered status plans do not adopt future benefit improvements.

**Mass Withdrawal.** In the model, all plans are assumed to go through mass withdrawal upon plan insolvency; no plans are assumed to go through mass withdrawals prior to plan insolvency.

**PBGC Premiums.** Premiums are paid in accordance with current law. 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 that models the curve of interest factors described in the 2019 financial statements. Those factors are based on a survey of private-sector annuity market prices.

**Discounting Future Present Values Shown in Report Tables.** Future amounts, other than claims, are discounted using the simulated 30-year Treasury rate generated for the particular year and economic path.

**Assumptions to Facilitate Suspension and Partition.** Assumes zero percent likelihood that the largest critical and declining plan will suspend benefits, a 30 percent likelihood that other plans will apply for suspension, and a 10 percent likelihood that other plans will apply for both suspensions and partitions. Determination of suspension and partition amounts follows this 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.
- The assumed average return on plan assets used in MPRA solvency tests is 5 percent (6 percent was used in the FY 2018 model).
- 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 percent of PBGC's guarantee. To be conservative, a lower asset return of 4.5 percent is used to test for suspension percentage changes (5.0 percent was used in the FY 2018 model).

**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. Under the new law, subject to a cap, Treasury will make annual transfers of unappropriated general revenues to the United Mine Workers 1974 Pension Fund until the plan is fully funded. Transfers are effective retroactively, beginning with fiscal year 2017. The plan is subject to certain restrictions and additional reporting requirements. Prior to the new law, the plan had projected that it would become insolvent in its July 1, 2022 – June 30, 2023 plan year.

Because the United Mine Workers Pension Plan's existing assets are declining and future employer contributions to the plan are very small, the future federal funding is the principal source of solvency for the pension plan going forward. Thus, long-term solvency projections for the 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 Workers retiree health plans, among other things.

Shortly after enactment in December of 2019, PBGC received estimates of projected transfers to the United Mine Workers Pension Plan from the Office of Management and Budget (OMB). These transfers were 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 2030, so for purposes of the projections in this report, the estimated transfer amount is assumed to stay level after FY 2030 until the United Mine Workers Plan is fully funded. Also, as a means of estimating the possible liabilities for the insurance program, for purposes of the projections in this report only, PBGC does not assume federal funding would cover PBGC financial assistance in any scenarios in which the plan is projected to have a temporary or permanent period of insolvency. No legal position or effect should be inferred from use of this modeling assumption, or any other assumption in this report.

The annual federal transfer amounts provided by OMB for FY 2020 through FY 2030 and used for the projections in this report (until the plan is fully funded) are as follows:

<b><u>Fiscal Year</u></b>	<b><u>Transfer Amount (in millions)</u></b>
FY 2020	\$1,576
FY 2021	\$321
FY 2022	\$332
FY 2023	\$387
FY 2024	\$389
FY 2025	\$395
FY 2026	\$401
FY 2027	\$405
FY 2028	\$406
FY 2029	\$405
FY 2030 and later	\$406

Given the uncertainty of the future amounts of federal transfers to the pension plan, a sensitivity analysis was prepared using lower estimates of future federal transfers to the plan. Those lower estimates assume \$150 million less per year beginning in FY 2021. Using these lower transfers to the plan does not change PBGC's projected insolvency year but does increase the chance the United Mine Workers Plan could become insolvent during the projection period. There is also a small impact to PBGC's projected FY 2029 mean net

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financial position: a worsening of the projected deficit by about \$0.2 billion compared to the results in this report.

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

- Proportion of active population assumed to be male: 70 percent.
- Proportion of retirees (in ongoing plans) assumed to be male: 80 percent.
- Proportion of terminated vested participants (in ongoing plans) assumed to be male: 94 percent.
- Age difference: females three years younger than their male spouses.
- Proportion of active population assumed to elect joint and survivor form: 60 percent.
- Proportion of retirees assumed to possess a joint and survivor form: 30 percent.
- Proportion of terminated vested assumed to elect joint and survivor form: 35 percent.
- Joint and survivor form: joint and 50 percent survivor benefit.
- Proportion of participants assumed married for pre-retirement death benefit: 80 percent.
- Conversion factors based on PBGC rates for the joint and 50 percent survivor benefit: 0.8730 for male participants; 0.9135 for female participants.

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## SE-PIMS

### *SE-PIMS — Overview*

PBGC's expected claims under the Single-Employer Program depend on two factors: the amount of underfunding in the pension plans that PBGC insures (i.e., exposure) and 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, changes in benefits, changes within industries, and economic conditions which impact bankruptcies.

SE-PIMS starts with PBGC's current net financial position and data on the funding status of more than 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 times 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 rules as prescribed by current law.

### *SE-PIMS — Data*

SE-PIMS uses the data for more than 500 actual plans, sponsored by more than 330 companies. These plans represent over half of PBGC's insurance exposure in the single-employer defined benefit system measured from the 2017 Form 5500 filings. SE-PIMS also reflects contribution data from later years' 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.
- Key financial information about the employer sponsoring the plan.

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

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Data on firms is from Compustat 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 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 IRS 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.

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 50 to 60 percent funded is compared to the same total for the insured universe, and similarly for plans 60 to 70 percent funded, 70 to 80 percent funded, etc. Partners are allocated for a best fit to the entire distribution.

SE-PIMS simulates contributions, premiums, and underfunding for these plans using the minimum funding and premium rules, and then extrapolates the results to the universe of single-employer plans.

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

Projections of claims against the insurance 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.<sup>25</sup> For each period, the model assigns random changes in each

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<sup>25</sup> The FY 2017 independent PIMS peer review, required by the Moving Ahead for Progress in the 21<sup>st</sup> 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.



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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 eliminates restrictions on the form of 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 then extrapolates the results of these simulations to the universe of insured single-employer plans.

### *SE-PIMS — Assumptions*<sup>26</sup>

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 the 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 frozen, 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.<sup>27</sup> 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 percent funded for termination liability. If the sponsor of a plan is simulated to experience bankruptcy and the plan is more than 80 percent funded for termination liability, the plan is assumed to be terminated through the standard termination process.

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<sup>26</sup> 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>.

<sup>27</sup> 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.

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

**Mortality.**<sup>28</sup> For sample plans' year-by-year mortality experience during the projection period: the blended RP-2014 annuitant and non-annuitant mortality table times 1.09, projected with MP-2018 (using just the ultimate improvement rates for all years after 2019) to the specified projection year on a static basis.

For the present value of PBGC benefit payments: the blended RP-2014 Healthy male mortality table times 1.09, projected for the approximate duration of PBGC's estimated future liability using the MP-2018 scale.

For purposes of determining minimum funding requirements, the blended IRS table for 2020 is used, projected on a static basis each year beyond 2020 using scale MP-2018. For calibrating to the most recently available Schedule SB target liability, which was 2017 for most plans in the sample, the RP2000-based blended IRS table was used. The blended IRS table for 2019 was approximated by starting with the blended IRS table for 2020 table and backing out the ultimate MP-2018 improvement scale for one year.

It is assumed that collectively bargained plans have received approval from IRS to use a substitute mortality table with mortality rates 9 percent higher than the standard table.

All adjustments to mortality tables above are based on a study of PBGC-insured participants and used in PBGC's financial statements.

**Contributions and Credit Balances.** The assumption on how sponsors of single-employer plans make contributions has been changed effective with the FY 2019 report.

Contributions are assumed to be driven by incentives such as complying with minimum contribution requirements, reducing the variable rate premium (VRP), and maintaining funded status at certain levels, 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 PPA minimum required contribution is assumed to be a floor for any specific contribution behavior. For plan sponsors that experience bankruptcy in the projections, contributions for the three years prior to bankruptcy are reduced to zero.

Plans that have already eliminated the VRP by funding to or beyond 100 percent 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 percent of the VBL within the last three years are assumed to make the largest of the following contributions.

- A multiple of the normal cost determined under PPA assumptions – a multiple of 1.5 for plans below 105 percent VBL funded grading down to a multiple of 1.0 for plans above 130 percent VBL funded;

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<sup>28</sup> 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, but the generational projections are not used for the 10-year projections in the Projections Report.

- The amount needed to eliminate a portion of the VBL deficit relative to the highest VBL funded ratio in the last three years – 30 percent of the deficit for plans below 110 percent VBL funded, 20 percent for plans above 115 percent VBL funded, otherwise 25 percent; or
- For plans that fall below 100 percent VBL funded, the amount needed to fully fund the VBL over 1-4 years for plans above 80 percent VBL funded, or over 7-10 years for plans below 80 percent VBL funded.

Sponsors of plans that have not been funded above 100 percent 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 percent 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 percent 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 reached \$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.

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Actual 2017 and 2018 contributions and the associated minimum required contributions are used to update the information from the 2017 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 restrictions apply if the plan's Adjusted Funding Target Attainment Percentage (AFTAP) is less than a specified percentage. Liabilities underlying the AFTAP calculation are determined using stabilized discount rates. Assets are the actuarial value of assets reduced by the credit balance. 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, the benefit improvement restriction is not applicable for SE-PIMS.
- **Lump Sum Restriction.** The lump sum benefit restriction is reflected to the extent a cash balance plan is projected to have an AFTAP below 80 percent.
- **Benefit Accrual Restriction.** Plans with funding percentages below 60 percent are assumed to freeze benefits and to remain frozen even if the percentage increases above 60 percent in the future.

**Credit Balance Waivers.** Because assets underlying the AFTAP calculation are reduced by credit balances (see above), sponsors are permitted to “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 percent 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 achieve 80 percent 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 guarantee level are not modeled.

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**PBGC's Assets.** PBGC's asset allocation as of September 30, 2019, is reflected as the starting point and portfolio risk is assumed to be gradually reduced as PBGC's funding status improves, in accordance with the investment policy.<sup>29</sup>

**Discounting Future Claims.** When SE-PIMS discounts future amounts, the discount factor is a single-interest factor that approximates the yield curve that would be used for PBGC's financial statements at the time of the projected calculation. Those factors are based on a survey of private-sector annuity market prices. There is an assumed reversion to the relationship of market interest rate and annuity pricing factors observed prior to the 2008 financial crisis.

**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.

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<sup>29</sup> <https://www.pbgc.gov/sites/default/files/april-2019-ips-pbgc.pdf>.

## SAMPLE STATISTICS FROM FY 2019 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 2019 Single-Employer Model Runs* (across 2020-2029 for 500 economic paths)			
	Long-Term Treasury Yield	Return on 30-year Treasury Bonds	Stock Market Return
Mean	2.3%**	2.0%	7.9%
Standard Deviation	0.8%	6.9%	20.0%
<b>Correlations:</b>			
Long-Term Treasury Yield	1.00	-0.32	-0.02
Return on 30-year Treasury		1.00	0.21
Stock Market Return			1.00

\* ME-PIMS yields economic returns within 0.1 percent and correlations within 0.02 of the single-employer results. ME-PIMS forecasts over 50 years as opposed to 20 years for SE-PIMS and, consequently, is prone to more extreme stochastic paths over the longer span of the projection.

\*\* The discount rate used to value PBGC liabilities and claims is this rate minus 13 basis points for both insurance programs.

Figure A-2			
Arithmetic Means and Standard Deviations of Market Rates Derived from Projected Long-Term Treasury Yields in FY 2019 Single-Employer and Multiemployer Model Runs			
	Long-Term Corporate Rate	Inflation Rate	Wage, Salary and Flat Benefit Growth Rate
Mean	3.4%	2.7%	4.2%
Standard Deviation	0.8%	0.8%	0.8%

Figure A-3	
Projected Plan Returns	
FY 2019 Single-Employer and Multiemployer Model Runs	
Arithmetic Mean	4.9%
Geometric Mean	4.4%
Standard Deviation	10.0%

Figure A-4	
Projected Annual Bankruptcy Probabilities <sup>30</sup>	
FY 2019 Single-Employer Model Runs	
Arithmetic Mean	0.6%
Standard Deviation	1.9%

Figure A-5	
Annual Rate of Plans' Projected Insolvency	
FY 2019 Multiemployer Model Runs	
Assuming MPRA Election Rates	
Arithmetic Mean	0.9%
Standard Deviation	0.2%

<sup>30</sup>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.

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## CHANGES FROM THE PRIOR YEAR

FY 2019 ME-PIMS includes the following changes from the FY 2018 Projections Report:

**Model Improvements.** The ME-PIMS model was improved from FY 2018 to (1) determine separate partition percentages for vested terminated and retirees and (2) more precisely estimate benefit payments for inactive participants.

**Legislation Affecting the United Mine Workers Plan.** The Bipartisan American Miners Act (P.L. 116-94) provided federal funding for the United Mine Workers Plan.

FY 2019 SE-PIMS includes the following changes from the FY 2018 Projections Report:

**Mortality Table Used to Determine the Amount of Underfunding at Termination.** The only mortality change was to update the scaling factor from MP-2017 to MP-2018.

**Mortality Table Used to Determine Plan Experience.** The only mortality change was to update the scaling factor from MP-2017 to the MP-2018.

**Contribution Policy.** The FY 2019 SE-PIMS model changed the approach to modeling single-employer plan contribution behavior. The prior version of SE-PIMS assumed that employers contributed the minimum required amount, but SE-PIMS then adjusted plan assets in a uniform way for all plan sponsors. The model now determines contributions based on the specific circumstances of a plan sponsor in each economic scenario. Plan sponsor contributions are assumed to be based primarily on three incentives: (1) meeting minimum contribution requirements, (2) reducing PBGC's variable rate premium, and (3) maintaining a certain funded level. More detail on the FY 2019 contribution policy can be found above in the Contributions/Credit Balances section of the Appendix.

**Model Improvements.** Changes made to the modeling system include improving data on valuation rates used to value liabilities for variable rate premium calculations and refinements to projections of plan participants' retirement and mortality rates, and improvements to the modeling of amortizations of plans' gains and losses.

**CSEC Plans.** The SECURE Act of 2019 set lower PBGC premium rates for cooperative and small-employer charity plans (CSEC plans). This is built into FY 2019 SE-PIMS premium modeling.



Both PIMS models include updated economic assumptions. The major assumptions are detailed below.

<b>Figure A-6</b>		
<b>Economic Assumption Changes for FY 2019</b>		
<b>FY 2019 Single-Employer and Multiemployer Model Runs</b>		
	<b>FY 2019</b>	<b>FY 2018</b>
Long-Term Treasury Yield*	2.3%	3.3%
Return on 30-year Treasury Bonds*	2.0%	3.2%
Stock Market Return (Arithmetic)*	7.9%	9.0%
Long-Term Corporate Rate	3.4%	4.4%
Inflation Rate	2.7%	2.8%
Wage, Salary and Flat Benefit Growth Rate	4.2%	4.4%
Projected Plan Returns	4.9%	5.9%
Annual Bankruptcy Probability for SE Plans	0.6%	0.5%
Annual Rate of Plans' Projected Insolvency for ME Plans**	0.9%	0.9%

\* ME-PIMS yields economic returns within 0.1 percent of the Single-Employer Model. ME-PIMS forecasts over 50 years as opposed to 20 years for SE-PIMS and, consequently, is prone to more extreme stochastic paths over the longer span of the projection. The discount rate used to value PBGC liabilities and claims is this rate minus 13 basis points for both years for both insurance programs.

\*\* Assumption appears the same due to rounding.