



## Key Points

- The PBGC's methods and assumptions produce a reasonable representation of its current obligation and deficit.
- New sources of income to address the deficit should be explored, but immediate premium increases on plan sponsors are not necessary or appropriate and could be counterproductive.
- Rising interest rates would have a favorable effect on the deficit but would be unlikely to eliminate it.
- There is no immediate crisis, assets are sufficient to pay benefits for many years and the funded ratio has held above 70 percent.
- Priority should be placed on developing a premium structure that reflects the risk that plans pose to the system with respect to future terminations.

## Perspectives on the PBGC Single-Employer Deficit

In November 2012, the Pension Benefit Guaranty Corporation (PBGC) reported a deficit of \$29.1 billion in its single-employer program for the federal fiscal year ended Sept. 30, 2012.<sup>1</sup> This report sparked divergent comments from observers. Some dismissed the reported deficit as overstated and misleading, the temporary result of unusually low interest rates. Others viewed the deficit as understated and sought higher premiums and additional income for the PBGC. The Pension Committee of the American Academy of Actuaries believes the methods and assumptions used by the PBGC produce a reasonable representation of the PBGC's current obligation and deficit. New sources of income to address the deficit should be explored, but immediate premium increases on plan sponsors are not necessary or appropriate and could be counterproductive.

### Background

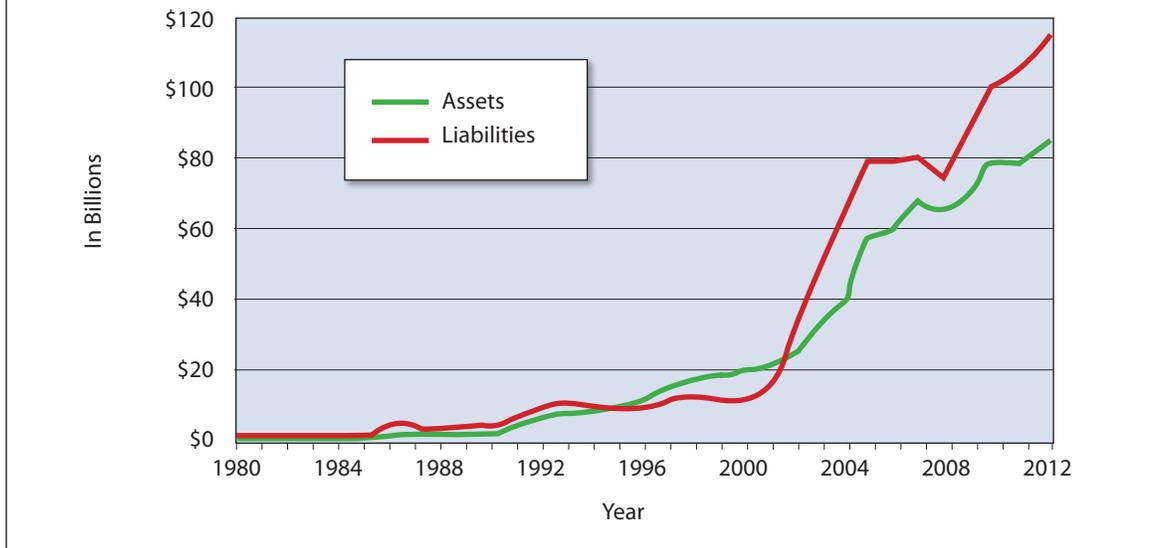
The PBGC, a government corporation created by the Employee Retirement Income Security Act of 1974, is not funded with general revenue tax dollars, but instead relies on the premiums charged to the sponsors of ongoing defined benefit pension plans and the assets of pension plans taken over in distress terminations. The PBGC's first 25 years saw steady

<sup>1</sup>The multiemployer program reports an additional deficit of \$5.2 billion. The multi-employer program operates differently than the single-employer program and is not addressed in this issue brief.

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**Figure 1: PBGC Single Employer Assets and Liabilities 1980–2012**



Source: PBGC Annual Reports, 1980–2012

growth of assets and sporadic growth of liabilities. The program accumulated a reported deficit of \$3.8 billion by 1986, and then recovered in the next decade to reach a surplus position of almost \$10 billion in 2000. But experience soured during the past decade, with liabilities growing much more rapidly than assets as distress terminations of several substantial plans saddled the PBGC with large unfunded liabilities. Congress enacted the Pension Protection Act of 2006 partly to require plans to fund toward solvency levels that would lessen the risk exposure to the PBGC. However, the stock market decline of 2007–09 and the continuing decline in interest rates have helped cause liabilities to grow faster than assets, despite relatively few major distress terminations since mid-decade.

### The Reported Deficit

The PBGC’s reported deficit is the difference between its assets and liabilities on Sept. 30, the last day of the

federal fiscal year. The value of the assets is not in question. In general, these are reported at fair market value each year as of Sept. 30. Assets in 2012 totaled about \$83 billion. The PBGC’s investment policy,<sup>2</sup> recently revised in May 2011, calls for a target fixed-income allocation of 70 percent with equity and other non-fixed income assets comprising the other 30 percent. The actual allocation was quite close to the target as of Sept. 30, 2012.

Disputes arise over the PBGC’s measurement of liabilities, which reached \$112 billion in 2012. The bulk of this liability consists of the present value of future pension benefits to be paid to the participants of the pension plans the PBGC has taken over.<sup>3</sup> The current value is dependent upon the assumptions made in estimating and discounting future benefits. Current value is particularly sensitive to how the future benefits are discounted for the time value of money.

After the PBGC assumes control of a pension plan, it determines the benefit due to each participant.

<sup>2</sup>“The investment policy objective is to maximize total return within a prudent risk framework that incorporates PBGC’s fixed obligations and asset composition of potential trustee plans.” – PBGC’s FY 2012 Annual Report.

<sup>3</sup>A relatively small amount in 2012, less than 2%, is included for plans deemed highly likely to terminate in the near future. These plans are referred to as “probable terminations.”

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Yet, after that benefit amount is finalized, the precise amounts that will be paid in the future are still uncertain. This uncertainty primarily revolves around two unknown factors: first, when will current workers actually retire and begin receiving benefits; and second, how long the participant (and possibly the participant's spouse) will live. For participants not yet in retirement status, the PBGC uses a table of expected retirement ages to estimate when payments will begin. To estimate how long these participants will receive benefits, the PBGC uses the mortality tables known as the RP-2000 Combined Healthy Male and Female Tables.<sup>4</sup> These assumptions are not particularly controversial, and most observers deem these to provide reasonable estimates of the benefits that will be paid.

## Measuring the Liability

Disagreement emerges when these future benefit payments are discounted to provide a present value as of the measurement date. The PBGC uses a survey provided by the American Council of Life Insurers to determine currently available annuity rates. With these annuity rates and the mortality assumptions noted above, the PBGC mathematically calculates the effective discount rate embedded in the annuity rates. For the federal fiscal year ended Sept. 30, 2012, this rate was 3.28 percent, down from 4.31 percent for the federal fiscal year ended Sept. 30, 2011.<sup>5</sup> The decline of this rate by 103 basis points in a year resulted in an increase of more than \$10 billion<sup>6</sup> in the PBGC liability measurement.

Measuring the present value of future benefits based on current annuity assumptions is intended to represent the amount needed to settle the PBGC's liabilities as of its financial statement date. While fully settling the PBGC obligation is regarded as an illustrative measurement, as the U.S. insurance market presumably lacks the capacity to underwrite the PBGC's level of annuities,<sup>7</sup> the Pension Committee believes the approach used by the PBGC produces a reasonable representation of the PBGC's current obligation and deficit.

There is a view that this measurement is too optimistic. Insurers include some premium for credit risk

in their rates. Some critics suggest the interest rates used to measure the obligation should be based on relatively risk-free Treasury interest rates. However, insurers include a margin for profit and marketing expense that partially offset any credit risk premium. In addition, many actuaries and economists agree that the preferential tax treatment of Treasury securities and the illiquidity premiums<sup>8</sup> available in the financial markets allow for rates that are somewhat higher than Treasury rates when measuring pension obligations.

An alternative view is that the PBGC measurement is too conservative and that the PBGC measurement should be more comparable to corporate pension plans. The financial statements of corporate plan sponsors require pension obligations to be measured on a "settlement" basis, but allow the interest rate to be estimated using high-quality corporate bond yields (rated no lower than AA). On Sept. 30, 2012, the Citigroup Pension Liability Index was 3.9 percent, higher than the annuity rate used by the PBGC. However, the duration of the Citigroup index is approximately 20 years while the PBGC duration is approximately 11 years. Adjusting the Citigroup index to a duration comparable to the PBGC would reduce the interest rate to about 3.5 percent, much closer to the PBGC rate. But a difference is expected as corporate bond yields include a premium to compensate for defaults, which, appropriately, is not part of the annuity rates used by the PBGC. Furthermore, corporate sponsors typically find that if they annuitize pension obligations, the cost is more than the financial statement liability.

Unusual U.S. monetary policy, which is currently keeping interest rates low, suggests another perspective: that interest rates should be based on historic averages, under the assumption that interest rates will rise and return to what are regarded as more normal levels. In fact, Congress incorporated this approach in the 2012 legislative effort to provide funding relief for corporate pension plans (thereby raising tax revenue needed to offset unrelated infrastructure investment).<sup>9</sup> These plans currently use a rate derived from the 25-year average of corporate bonds. For a liability duration comparable to the PBGC's, this rate would be

<sup>4</sup> Each table is projected 10 years beyond the fiscal year end using mortality improvement Scale AA and set back one year. The tables are available at <http://www.soa.org/Research/Experience-Study/Pension/research-rp-2000-mortality-tables.aspx>.

<sup>5</sup> PBGC used the 3.28% rate for the first 25 years and used 2.97% for years beyond 25. In FY 2011, the 4.31% was used for the first 20 years and 4.26% was used beyond 20 years. For simplicity, this paper references only the rate for the initial period.

<sup>6</sup> \$10.718 billion per Statements of Operations and Changes in Net Position, Page 48, PBGC's FY 2012 Annual Report.

<sup>7</sup> Multiple large annuity purchases in 2012 demonstrated that the insurance market has greater capacity than previously thought, although whether this level is sustainable is uncertain. Furthermore, while aggregate transactions substantially increased, they do not yet approach the more than \$100 billion level of the PBGC obligation.

<sup>8</sup> A significant portion of the spread of high-quality corporate bond yields over Treasury yields is seen as related to illiquidity. Illiquidity can be viewed as the potential that a security cannot be sold at the desired time without a loss in value. Investors who do not need the flexibility to sell the security at any time may earn an illiquidity premium (higher yield or return) over time.

<sup>9</sup> Lower contributions to pension plans mean lower tax deductions and thus higher tax revenue.

approximately 6.2 percent at Sept. 30, 2012. Regardless of the level of future rates, using such a rate today would be inconsistent with market measurements and would not provide meaningful information about the current funded status of the PBGC program.

A different type of measurement could be useful if one recognizes that Congress included in the PBGC’s mandate the responsibility to manage the assets and pay benefits when due. This suggests a measurement that would focus on the amount of assets needed to pay future benefits, assuming a certain return on assets. Measurements based solely on bond yields do not reflect anticipated growth in the portfolio and the resulting capacity for providing future benefits. This view suggests that the discount rate for measuring obligations should be based on the expected return of the assets in the PBGC trust funds. Because the trust funds are invested approximately 30 percent in non-fixed income assets that might be expected to earn a higher return than bonds, the discount rate would be higher than any bond rate.

Following this logic, the PBGC’s deficit would disappear if obligations were measured using an expected return of 6.6 percent or higher. The PBGC investment portfolio has earned returns higher in recent years.<sup>10</sup> But these favorable returns were driven by appreciation on the fixed-income portfolio resulting from a long-term trend of decreasing interest rates. It might not be realistic to expect such large gains in the future.

Future investment gains, should they occur, would

immediately reduce future deficits as they are reflected in the market value of assets. But reducing liabilities by reflecting risk premiums before any higher returns actually occur understates the current value of the PBGC obligations and would be inconsistent with the way most financial statements are prepared.<sup>11</sup>

While the reported deficit is a reasonable representation of the PBGC’s current funded status, changes in interest rates would change the deficit by affecting both liabilities and assets. The next section will explore these effects.

### Effect of Changing Assumptions on PBGC’s Reported Deficit

Table 1 shows how the PBGC measurement of liabilities might change using different illustrative interest rates to discount future benefits.<sup>12</sup> All amounts in the tables are expressed in billions.

Lowering the interest rate by 50 basis points to approximate the risk-free rate, would increase the PBGC’s reported liabilities by about \$6.0 billion, as shown by comparing the first column of numbers with the second. On the other hand, by comparing the second column with the last column, if interest rates rise by 300 basis points, the decrease in reported liabilities would be \$26.5 billion—almost equal to the \$29.2 billion deficit currently reported by the PBGC.

Although the liability reduction indicated in Table 1 that would come with higher interest rates seems like a good-news scenario, let’s consider what could

**Table 1: Estimated Effect of Changing Interest Rate on Reported Liabilities**

	Interest Rate				
	2.78%	<b>3.28%</b>	4.28%	5.28%	6.28%
Present Value of Future Benefits	\$111.6	<b>\$105.6</b>	\$95.2	\$86.5	\$79.1
Other Liabilities	6.5	<b>6.5</b>	6.5	6.5	6.5
Total Liabilities	\$118.1	<b>\$112.1</b>	\$101.7	\$93.0	\$85.6

Dollar amounts are expressed in billions. PBGC’s reported values are shown in bold.

<sup>10</sup>Total return for 2012 was 12.6%. The three and five year returns are 9.9% and 7.1%, respectively.

<sup>11</sup>The PBGC is a government corporation that prepares financial statements in accordance with Generally Accepted Accounting Principles. The Federal Accounting Standards Advisory Board, which issues Federal Accounting Standards, requires pension benefits be discounted with the rate on marketable Treasury securities. The Financial Accounting Standards Board, which sets accounting standards for private entities in the U.S., requires discount rates to reflect high-quality fixed-income rates. The Government Accounting Standards Board allows state and local governments to use discount rates that reflect the expected return on assets.

<sup>12</sup>We discounted the actual cash flows associated with the present value of future benefits for the plans trustee by the PBGC at the indicated rates for the first 25 years and the indicated rate less 31 basis points beyond 25 years. We assumed that the plans pending takeover by the PBGC and the probable terminations have the same duration as the currently trustee plans.

happen to the assets in the PBGC trust funds. First, we assume interest rates return to levels more consistent with historic averages. Second, we assume rates remain steady at current levels.

Thirty percent of the PBGC's investment portfolio is in non-fixed income investments, mostly equities, which generally do not demonstrate a strong correlation to interest rates. It can be argued both that increasing interest rates would cause a decline in equity values, as well as increasing rates would cause an increase in equity values. For simplicity, no correlation assumption was made for this illustration, and thus the value of non-fixed income investments would remain unchanged.

The fixed-income portion of the trust funds is easier to address. These investments have a direct correlation to changes in interest rates measured by the duration of the investment portfolio. The PBGC reports that the duration of the fixed-income portfolio is 9.3 years, somewhat shorter than the 11.4 years of the liabilities. Using this duration, we can estimate the change in value of the current portfolio if interest rates were to increase (Table 2).

The next step is simply to combine the assets and liabilities based on the estimated changes to determine the theoretical deficit.

The relatively optimistic picture that comes into view when looking only at liabilities with increasing

interest rates is altered when the effect on investments is combined with the lower calculated liabilities. Increasing interest rates would improve the outlook for the PBGC, but would not cause the deficit to disappear. The estimates in Table 3 show that an immediate increase in interest rates of 300 basis points would reduce the reported deficit by about 45 percent to \$15.9 billion—still a very substantial sum.

If interest rates remain relatively stable at current levels, the fixed-income portfolio of the PBGC trust fund would be expected to provide a return consistent with current bond rates. The total return on the fixed-income investments would likely be the expected yield to maturity of the securities. According to the PBGC's FY 2012 Annual Report, the yield to maturity on the current portfolio is 2.7 percent, less than the interest rate of 3.28 percent used to calculate liabilities. This means that the equity portion of the portfolio would have to earn at least 4.6 percent in order for the total portfolio to earn 3.28 percent. However, the equity portion of the portfolio may perform better than this, and if for instance, the equity portfolio earns 8 percent, the total portfolio would earn approximately 4.3 percent. If liabilities were calculated at this rate with assets at current market values, the reported net position would be a deficit of approximately \$18.6 billion.

**Table 2: Estimated Effect of Increasing Interest Rates on Asset Values**

	Interest Rate			
	3.28%	4.28%	5.28%	6.28%
Fixed Income Assets (70%)	<b>\$58.1</b>	\$53.1	\$48.7	\$44.8
Non-fixed Income Assets (30%)	<b>24.9</b>	24.9	24.9	24.9
Total Assets	<b>\$83.0</b>	\$78.0	\$73.6	\$69.7

Dollar amounts are expressed in billions. PBGC's reported values are shown in bold.

**Table 3: Estimated Deficit at Various Interest Rates**

	Interest Rate			
	3.28%	4.28%	5.28%	6.28%
Total Liabilities	<b>\$112.1</b>	\$101.7	\$93.0	\$85.6
Total Assets	<b>83.0</b>	78.0	73.6	69.7
Deficit	<b>(\$29.1)</b>	(\$23.7)	(\$19.4)	(\$15.9)

Dollar amounts are expressed in billions. PBGC's reported values are shown in bold.

## Future Dangers

The PBGC faces two significant future financial dangers. First, PBGC premiums may not be sufficient to cover the costs of future plan terminations. The “underwriting gain or loss” is the term PBGC uses to describe its experience other than investments and actuarial adjustments. The underwriting gain or loss is equal to the premium income reduced by all administrative expenses and the unfunded liability of plans that it takes over in distress terminations during the year.

The PBGC’s surplus was wiped out by massive underwriting losses in 2002-05 of \$31.7 billion, primarily the result of several large-plan terminations in the airline and steel industries. Since 2005, the underwriting experience has been much better, with total gains of about \$11.3 billion.

Underwriting experience is difficult to predict. Past losses appear to be more related to the decline of specific industries than to the general economic cycle. The recession of 2007-09 has not precipitated large underwriting losses, although losses came perilously close. Major bankruptcies occurred in the automotive and airline industries but did not result in losses when plan sponsors and creditors agreed to maintain pension plans after bankruptcy.

The PBGC’s FY 2012 Annual Report shows the potential exposure to future terminations approaches \$300 billion with approximately 85 percent of this exposure concentrated in three sectors: manufacturing, transportation, and services. Should one or more of these economic sectors experience downturns that result in distress plan terminations, underwriting losses could increase dramatically despite the recent increase in premiums.

A second serious danger to the PBGC’s financial viability is the declining number of defined benefit plan sponsors. As plan sponsors close and freeze plans, the PBGC’s premium base gradually declines. Sponsors of frozen plans are considering exit strategies under which they may offer lump-sum distributions or purchase annuities, and ultimately terminate their plans. Lump sums and annuity purchases reduce PBGC premium income, and when plans terminate, PBGC premiums cease. Even if the sharply higher

PBGC premiums<sup>13</sup> legislated in 2012 prove sufficient to cover the cost of future terminations, the total premiums collected are unlikely to fund the existing deficit with the premium base eroding.

## The Future Deficit

The PBGC’s future deficit will be influenced by multiple factors but primarily the level of interest rates, the actual return on the assets, and underwriting experience.

Rising interest rates would have a favorable effect on liabilities, but are unlikely to eliminate the significant deficit. Stable interest rates or further declines in interest rates could perpetuate the deficit, perhaps causing it to grow further. Any changes in interest rates will have an offsetting effect on asset returns as described earlier. Equity returns could enhance or hold back overall portfolio returns and thereby lower or raise the deficit, but, with only 30 percent equity exposure, even favorable returns are unlikely to eliminate the deficit.

Underwriting risk remains significant. The massive losses of 2002-05 occurred a few years after the recession of 2001. Similar underwriting losses have not developed from the recession of 2007-09, but the horizon looks cloudy. Funding ratios of corporate pension plans have declined.<sup>14</sup> The economic recovery has been slow. The potential exposure to loss is increasing, with large amounts of risk concentrated in a few industries. The required contributions of plan sponsors are temporarily decreasing rather than increasing due to funding relief granted through the higher interest rates enacted in 2012 by the MAP-21 legislation.

Information on future claims and deficits is sparse. The most common source is the PBGC Exposure Report in which the agency provides an actuarial evaluation of its projected future financial status based on modeling of future claims, premiums, investment returns, and other factors. Results from the report are referred to below, but the Academy Pension Committee has not reviewed the Pension Insurance Modeling System (PIMS) methodology or assumptions that produced these projections. Concerns regarding the reliability of the PIMS led Congress to require the PBGC to obtain an annual independent review of the PIMS.<sup>15</sup>

<sup>13</sup> Premiums have grown from \$1 per participant in 1976 to \$42 per participant today and will increase to \$49 in 2014. The variable rate premium of 0.9% assessed on any unfunded liability further increases the total premium for any pension plan that is not fully funded. These variable rate premiums will double to 1.8% in 2015. Both the flat rate and the variable rate premiums are indexed to inflation beyond 2014.

<sup>14</sup> The Milliman 100 Pension Funding Index declined from 105.3% in 2007 to 70.5% in July 2012 but has recently improved to 89.7% in July 2013. The Mercer index of S&P 1500 pension sponsors had comparable measures.

<sup>15</sup> The annual peer review requirement was enacted in 2012. The first peer review is not yet complete.

The PBGC's Exposure Report shows potential new claims during the next 10 years ranging from \$14 billion to \$55 billion with a mean amount of \$34 billion.<sup>16</sup> Premium projections over the same period range from \$19 billion to \$36 billion with a mean of \$27 billion.

Gradually increasing interest rates, a strong U.S. economy that boosts profits and reduces the incidence of bankruptcies, a strong stock market that improves funded ratios of private pension plans and the PBGC, and a significant increase in premium income resulting from the MAP-21 premium rate increases would make the current PBGC deficit an unpleasant memory by the end of this decade. That scenario could even eliminate the PBGC deficit – the PBGC's Exposure Report shows a deficit of only \$1 billion in 2022 under the 85th percentile of results (the most favorable). However, the majority of future projections in the PBGC Exposure Report show the deficit will remain significant or increase from current levels.

### Are Urgent Changes Needed?

By any reasonable measure, the PBGC has and will continue to have a significant deficit even if interest

rates return to historical levels. Funded ratios significantly less than 100 percent present serious concerns about the viability of the program. But there is not an immediate crisis or liquidity concern. The current assets of the PBGC are sufficient to pay benefits for many years. If the investment portfolio earns the 3.28 percent assumed in the liability calculation, the assets are sufficient to pay projected benefits for more than 15 years disregarding premium income and additional plan terminations. With no investment earnings or premium income, the assets are still sufficient to pay benefits for more than 12 years.

Despite a severe financial crisis, a slow recovery, substantial declines in interest rates and a decade of lackluster equity returns, the PBGC-reported funded ratio has been holding above 70 percent (Figure 2). The PBGC Exposure Report projects that this funding ratio could range from 60 percent to 100 percent in 10 years with the mean ratio about 76 percent.<sup>17</sup>

Though the issues surrounding PBGC's deficit are serious, immediate action is not necessarily needed. Substantial premium increases are now in place, which will aid the PBGC's cash flow. Significant depletion of the PBGC's assets is unlikely to occur for many years. Nevertheless, the ultimate ability of the PBGC to ac-

**Figure 2: PBGC Single Employer Funded Ratio 1980–2012**



Source: PBGC Annual Reports, 1980–2012

<sup>16</sup> The range is based on the 15th and 85th percentiles of a stochastic projection

<sup>17</sup> The Exposure Report provides the 15th percentile, mean, and 85th percentile projections of assets, liabilities, and net position separately for each item. The 15th percentile for liabilities may not coincide with the 15th percentile for assets, thus the range cited above is approximate.

comply with its mission could be in doubt if the deficit is not addressed. The Government Accountability Office (GAO) recently published a report<sup>18</sup> on the premium structure of the PBGC that supported a structure with greater emphasis on the risk each sponsor poses to the PBGC. The Academy's Pension Practice Council urged in its issue brief on PBGC premium structure<sup>19</sup> that insurance principles be recognized and that premiums should primarily cover the cost of future terminations and should not be used to fully fund the deficit. The issue brief urged that other sources of revenue be explored to gradually reduce the deficit.

## Conclusion

The current PBGC deficit is real and significant when measured on any reasonable basis. Under the current premium structure, only a minority of projections in the PBGC Exposure Report show significant reduc-

tions in the PBGC deficit, while most projections show increases. Priority should be placed on developing a premium structure that reflects the risk current plans pose to the insurance system, that reasonably covers the cost of anticipated future terminations, and that rewards well-funded plans with lower premiums. A premium structure correlated with the risk that plans pose to the system would encourage sponsors to fund plans better and lessen the risk associated with potential terminations.

The current PBGC deficit was caused by inadequately funded plans that were terminated. Charging current plans for past underwriting losses will increase the incentive for plan sponsors to exit the pension system. New sources of revenue, as suggested in the Pension Practice Council's 2012 Issue Brief, should be developed for the PBGC to finance the current deficit.

<sup>18</sup> Redesigning Premium Structure Could Better Align Rates with Risk from Plan Sponsors at: <http://www.gao.gov/assets/650/649838.pdf>.

<sup>19</sup> Examining the PBGC Premium Structure at: [http://actuary.org/files/publications/IB\\_on\\_PBGCPremium\\_120426.pdf](http://actuary.org/files/publications/IB_on_PBGCPremium_120426.pdf).