

MULTIEMPLOYER PENSION PLANS: CURRENT STATUS AND FUTURE TRENDS

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Abstract

Multiemployer pension plans, like other employer plans, have been challenged by two financial crises since 2000. The majority of multiemployer plans are returning to financial health, but a substantial minority face serious funding problems that are exacerbated by unique structural challenges in the multiemployer sector. These challenges include a high ratio of inactive to total participants, high rates of negative cash flow, and inadequate withdrawal penalties so that exiting companies do not cover the costs they leave behind.

The Multiemployer Pension Reform Act (MPRA) of 2014 has not proved to be a cure-all for the multiemployer crisis. As of November 2017, the U.S. Treasury Department has approved four of the 15 benefit-cut requests submitted by these plans. Of the remainder, one application remains under review, five applications have been denied, and five have been withdrawn. So, while the ultimate effectiveness of MPRA still remains to be seen, it is clear that other solutions must also be explored to alleviate the multiemployer burden.

At this stage, the majority of proposed solutions to the multiemployer challenge fall into two categories: alleviating the burden of orphaned members – workers left behind when employers exit – and providing subsidized loans – either through direct government lending or government guarantees on private sector loans. Whatever the ultimate solution, a case can be made for a package that involves contributions from employers (tailored not to sink already fragile plans), from plan participants, and from taxpayers.

Any solution to the multiemployer problem must be comprehensive, helping not only those in serious trouble today but also staving off future problems. Early action might stabilize other plans heading for trouble. One clear warning sign for plans is a negative cash flow rate in excess of negative 10 percent.

Introduction

Private sector multiemployer pension plans are negotiated by a union with a group of employers typically in the same industry. These plans expanded benefits during the stock market booms in the 1980s and 1990s and then became significantly underfunded in the wake of the two financial crises after the turn of the century. The great majority of troubled multiemployer plans responded to the financial pressures by cutting the rate of future benefit accruals and requiring the bargaining parties to negotiate higher contribution rates, enabling most of them to navigate to relatively secure footing. But a significant number of plans, covering about one million of the 10 million participants in multiemployer plans, could run out of money within the next 15 to 20 years. Additionally, the Pension Benefit Guaranty Corporation (PBGC), the backstop for defunct plans, expects its multiemployer insurance program to run out of money within 10 years.

Congress has addressed the multiemployer issue in two recent major pieces of legislation. The first was the Pension Protection Act of 2006 (PPA), which required plan trustees to look past valuations on a single date and assess where the plan is headed and, when necessary, to take action to restore the plan to viability. The second piece of legislation was the Multiemployer Pension Reform Act (MPRA) of 2014, which increased funding for the PBGC's multiemployer insurance program, expanded the agency's ability to facilitate mergers between troubled and healthier plans, and allowed plans facing impending insolvency – “critical and declining” – to cut accrued benefits for their current workers and retirees if approved by the Treasury. As of November 2017, the Treasury has approved four of the 15 benefit-cut requests submitted by these plans. Of the remainder, one application is under review, five have been withdrawn, and five have been denied – including the application of the 400,000-participant Central States Teamsters plan.

Thus, severely underfunded multiemployer plans remain a problem. Finding a solution requires a clear understanding of the magnitude of today's shortfall among plans characterizing themselves as “critical and declining,” assessing the likelihood of additional plans falling into this distressed category, and evaluating arguments for and against allocating the burden to each of the three players: plan participants, employers, and taxpayers. Finally, it is important to develop strategies to prevent additional plans from falling into the “critical and declining” category.

To address these issues, this study proceeds as follows. The first section describes the nature of multiemployer plans and their role in the nation's retirement system. The second section discusses the factors – financial crises and serious structural challenges – that have produced a large number of vulnerable plans and estimates that the 2015 unfunded liability is \$187 billion for all “critical” plans and is \$76 billion for “critical and declining” plans. Having determined the size of the financing shortfall, the third section explores the options for providing relief and for dividing up the financing burden among participants, employers, and taxpayers. The fourth section explores the likelihood of additional multiemployer plans falling into the “critical and declining” category.

The final section concludes that, at this point, the two most promising options for the “critical and declining” plans are alleviating the burden of orphan participants and providing subsidized loans. Either approach costs money, and a case can be made for a package that involves contributions from employers (that are tailored to avoid further employer withdrawals) and from plan participants and taxpayers. Most importantly, it is crucial to understand how plans got into this desperate plight. Early action might stabilize other plans in the red zone – both “critical” and “critical and declining” – heading for trouble. Indeed, a significant number have negative cash flow rates in excess of negative 10 percent. Thus, any plan to solve the multiemployer problem must be comprehensive, helping not only those in serious trouble today but also staving off future problems.

An Overview of Multiemployer Plans

Multiemployer defined benefit plans are created by collective bargaining agreements between at least one labor union and two or more employers. These plans are typically set up as trusts, as required by the Taft-Hartley Act and the Employee Retirement Income Security Act of 1974 (ERISA), and are managed by a board of trustees appointed in equal numbers by the union and the employers. The trustees, as plan fiduciaries under ERISA, have responsibility for managing the assets and administering the benefits.

The contributions to the plan are negotiated in bargaining agreements between an employer and its union. A typical amount might be \$5 for each hour that a participant works. The trustees, working with a given revenue stream, then set the benefits. Multiemployer plans generally pay a dollar amount per month for each year of service, say \$60, so a worker with 30

years of service would receive \$1,800 a month at age 65 for life. Alternatively, benefits could be a specified percentage of the employer’s required contributions. For example, a monthly benefit could be set at 2 percent of total required contributions, so that a participant with 1,500 hours of work at a \$2 hourly contribution rate would accrue \$60 of monthly benefits. Some multiemployer plans have had changes in their benefit formulas over time, so participants accrue different benefits for different years. Unlike single-employer plans, multiemployer plans offer portability if participants move among contributing employers within the plan.¹

Multiemployer plans typically exist in industries with many small employers – employers that would not ordinarily establish a defined benefit plan on their own – and where it is common to move from one employer to another. Table 1 shows that most participants are covered by the relatively few large plans (10,000+ participants), but the system also has many small plans (fewer than 1,000 participants).

Table 1. *Distribution of Multiemployer Plans and Participants, 2015*

Plan size (number of participants)	Percentage of total participants	Number of:	
		Plans	Employers per plan
Large (10,000 or more)	79.3%	176	693
Medium (1,000-9,999)	18.4	631	111
Small (fewer than 1,000)	2.3	474	29
Total	100.0	1,281 ^a	164

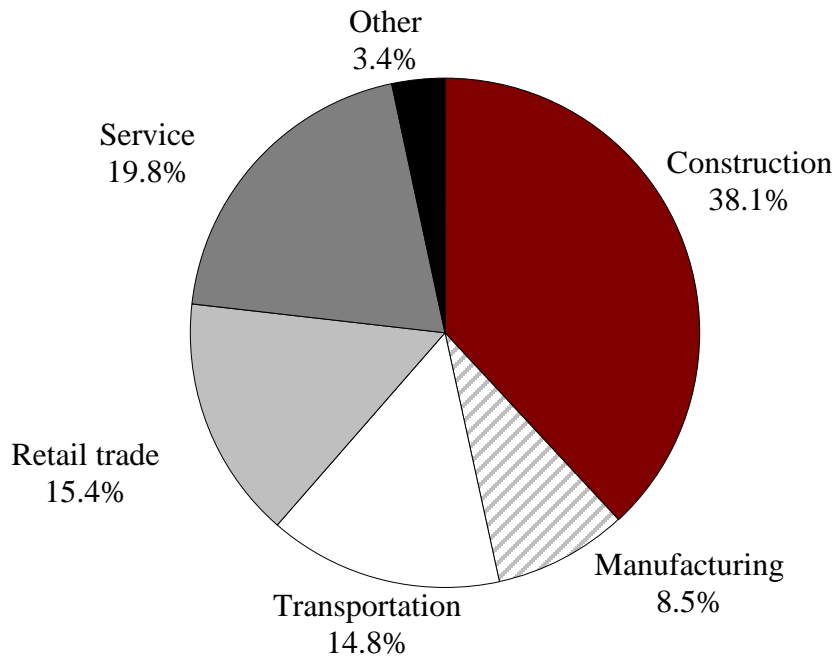
^aThe number of plans reflects the total number of observations available for plan-level analysis in the Form 5500 database.

Source: Authors’ calculations from U.S. Department of Labor, *Form 5500* (2015).

Figure 1 shows the distribution of plan participants by industry. Almost 40 percent of multiemployer participants work in the construction industry; construction plans generally rely on a large number of small contributing employers. Fifteen percent are in the transportation industry, half of which are covered by Teamster plans, which tend to be among the largest plans. Other industries in which multiemployer plans operate include manufacturing, retail trade, health care, entertainment, communication workers, print news media, printing, and mining.

¹ Further, many plans maintain reciprocity agreements by which participants can aggregate service under multiple plans to qualify for benefits.

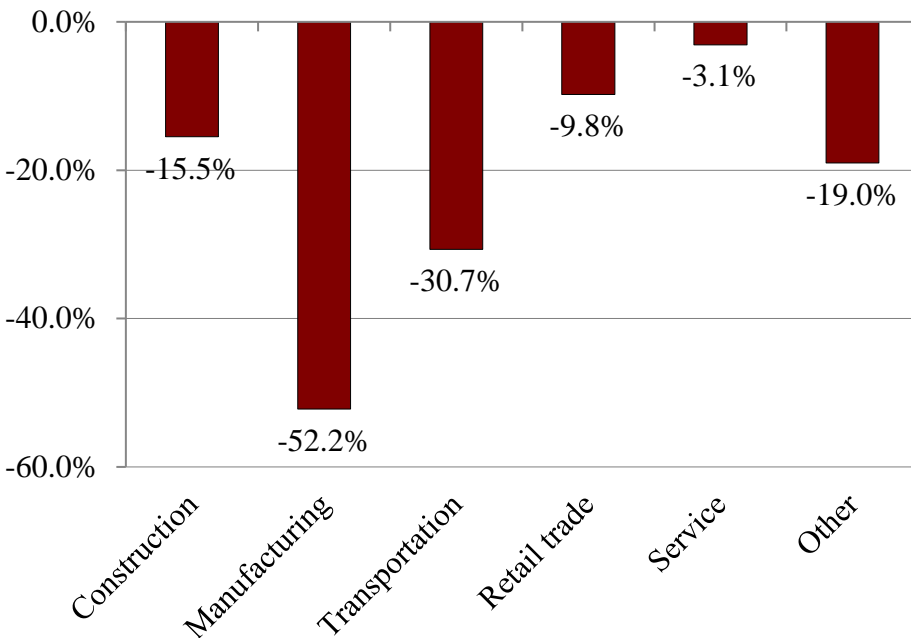
Figure 1. *Multiemployer Plan Participants by Industry, 2015*



Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015) using the PBGC's industry codes for multiemployer DB plans.

The number of active participants in multiemployer plans has declined in all industries since the turn of the century, with manufacturing and transportation experiencing the largest decline (see Figure 2).

Figure 2. *Percentage Change in Active Members in Multiemployer Plans by Industry, 2001-2015*



Source: Authors' calculations from U.S. Department of Labor, *Form 5500* (2001-2015).

Table 2 compares multiemployer plans to other components of the employer-sponsored retirement system, using data from the Form 5500 database and the U.S. Census Bureau's *Survey of Public Pensions*. Several factors stand out. First, as of 2014, multiemployer plans, with 10.1 million participants, are a small but significant segment of the retirement system. Second, these plans (as well as private, single-employer defined benefit plans) have a high percentage of inactive participants (retirees and terminated vested workers) relative to total members. Finally, multiemployer plans have modest benefits, less than half of the benefits in the state/local sector and about 60 percent of those provided by single-employer defined benefit plans.² Given the large number of workers involved and the modest benefits, it is crucial to understand how some multiemployer plans got into serious trouble and what can be done.

² The average benefit is total benefits divided by the number of retirees.

Table 2. *Multiemployer Plans in the Employer-Sponsored Retirement System, 2014*

Plan type	Participants		Plans	Assets		Average benefit
	Total (millions)	Percent inactive ^a		Total (trillions)	Per participant	
Private DC	90.1	20.2%	639,066	\$5.1	\$56,795	N/A
Private single employer DB	27.7	62.0	43,466	2.5	89,860	\$20,625
State/local DB	29.3	51.3	3,972	3.7	126,459	26,458
Multiemployer	10.1	60.5	1,403 ^b	0.5	49,572	12,547

^aThe defined contribution (DC) and defined benefit (DB) numbers are not quite comparable. The Form 5500 defines active participants in a DC plan to include all eligible workers, even in the absence of employee or employer contributions. On the other hand, most DB participants stay in the plan through retirement, while most DC participants take a cash-out or rollover and leave the plan when they separate from an employer.

^bThis total reflects the total number of plans published in EBSA's Private Pension Plan Bulletin. It exceeds the 1,281 observations available in the Form 5500 data base that can be used for plan-level analysis.

Sources: Authors' calculations from U.S. Department of Labor (2016a); and U.S. Census Bureau (2014).

How Did Multiemployer Plans Get to This Point?

The finances of multiemployer plans have been driven by both fluctuations in the financial markets and structural considerations.

Financial Markets

Multiemployer plans thrived during the 1980s and 1990s; the stock market soared, participants had plenty of work, and employers were making good profits. By the late 1990s, many plans were fully funded. In this environment, unions were concerned that employers would stop contributing to the plans due to limits on the tax deductibility of employer contributions to fully funded pension plans. They were wary of interrupting the flow of contributions, because restarting contributions when markets cooled would require reducing other components of compensation.³ To ensure that contributions remained tax deductible for employers, plans offset the increased funded levels by repeatedly increasing benefits.

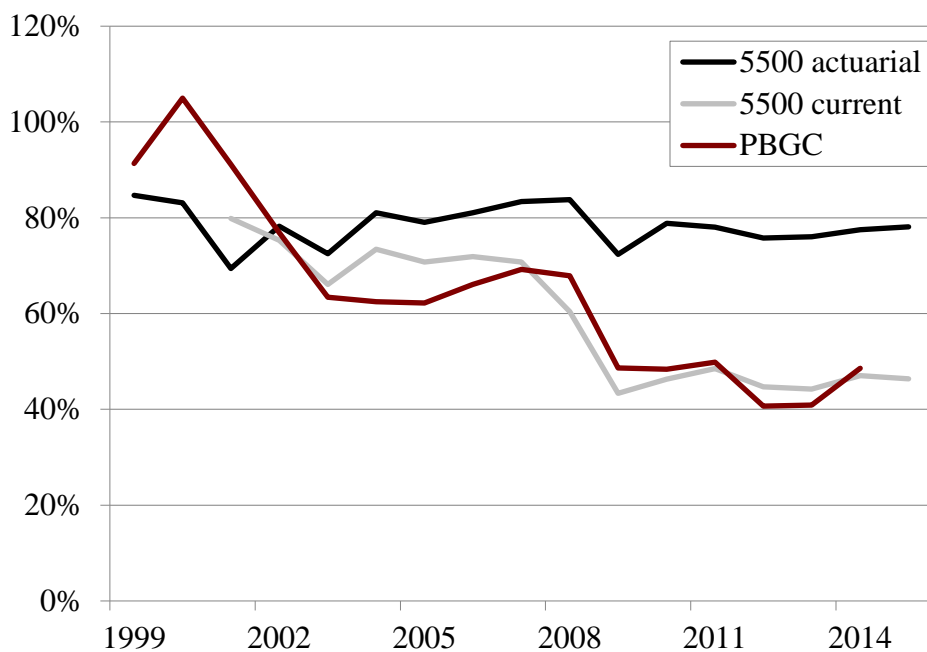
The good times ended with the bursting of the dot-com bubble in 2000. All pension plans were hurt, but the collapse of stock prices was particularly painful for multiemployer plans, which – with many retirees and declining numbers of active participants – had been living off investment returns.⁴ As the returns turned negative, funded levels plummeted.

³ Mazo and Greenblum (2012).

⁴ Solis, Geithner, and Gotbaum (2013).

Three sets of funded ratios are available for multiemployer plans – two from the Form 5500 and one from the PBGC (see Figure 3). The Form 5500 presents both a current view and an actuarial smoothed view. The actuarial view averages asset values over a period of time and uses the expected return on plan assets as the discount rate. The current view is based on the market value of plan assets and a liability calculated using a four-year average yield on 30-year Treasuries as the discount rate. The PBGC number is also based on the reported market value of assets but adjusts the reported vested liabilities using a standardized interest rate factor, along with an assumed mortality table that reflects the cost of purchasing an annuity at the beginning of the year. Regardless of the definition, Figure 3 shows that multiemployer plans were well funded during the 1990s and saw their funded levels collapse in the wake of the bursting of the dot-com bubble at the turn of the century.

Figure 3. *Funded Status of Multiemployer Plans under Various Definitions, 1999-2015*



Note: The most recent PBGC data tables are from 2015, reporting 2014 data.

Sources: PBGC (2014); and authors' calculations from U.S. Department of Labor, *Form 5500* (1999-2015).

Although multiemployer plans by 2004 appeared to have weathered the storm, the multiemployer plan community worked with Congress to update funding rules.⁵ This effort culminated in the Pension Protection Act of 2006 (PPA), the key innovation of which was to

⁵ Mazo and Greenblum (2012).

require trustees to look past valuations on a single date and assess where the plan is headed. Plans with a projected funding deficiency within the next four or five years or a near-term cash flow problem are deemed “critical;” those with less serious problems are “endangered.” “Critical” plans are characterized as being in the red zone, endangered plans in the yellow zone, and all other plans in the green zone. Plans in the red or yellow zones must take corrective action. The law also provided multiemployer plans with new tools to achieve these goals.⁶

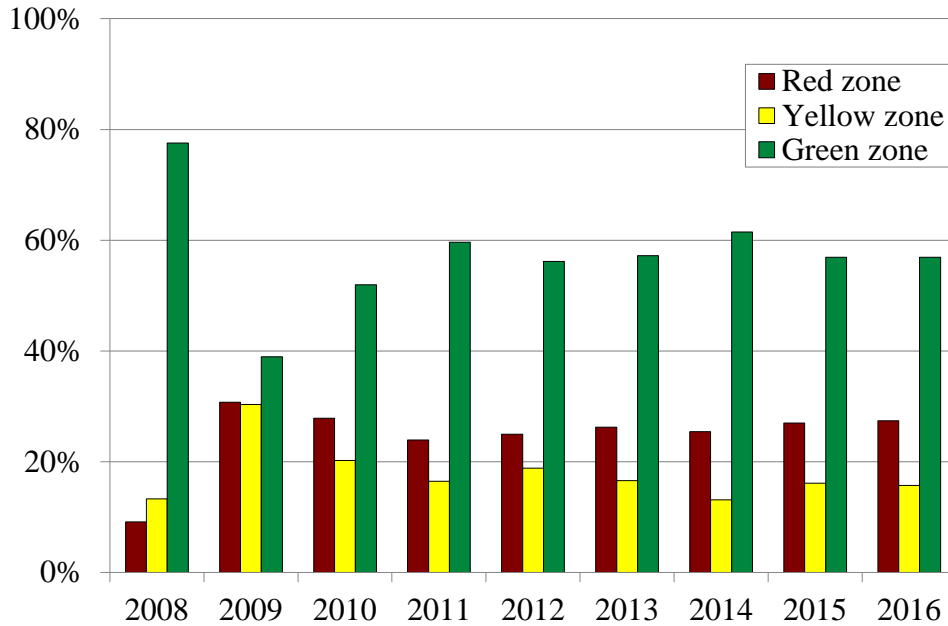
Figure 4 shows the zone status of multiemployer plans over the period 2008-2016 using data from the Form 5500 and the U.S. Department of Labor (DOL). In 2008, after the PPA first took effect and before the financial crisis, 78 percent of plans were in the green zone, 13 percent in the yellow zone, and 9 percent in the red zone.⁷ Then the markets crashed and the economy tanked, causing unfunded liabilities to spike and the number of troubled plans to soar. As the economy and the stock market began to recover, a large share of multiemployer plans moved from the yellow zone back to the green, but the share in the red zone declined only slightly.⁸ This pattern should not be surprising. Most of the plans in the red zone anticipated their failure to meet the minimum funding requirements and some faced possible insolvency in the next 10 years, an outlook that does not change materially with an uptick in stock prices. From 2011 to 2016, the percentage of plans in the red zone changed very little.

⁶ When a plan goes into the yellow zone, the PPA restricts contribution reductions and benefit increases and requires that the trustees come up with a plan to close the funding gap by at least one-third over a 10-year period. When a plan goes into the red zone, in addition to restrictions on contribution cuts and benefit increases, the plan must stop paying lump sums or other front-loaded benefits to new retirees and devise a plan to get out of the red zone within a 10-year period. Once in the red zone, plan trustees can cut benefits for current workers that are usually protected from cutbacks – so-called ‘adjustable benefits,’ such as recent benefit increases, early retirement subsidies, and other benefit features. Importantly, no cuts to adjustable benefits can be made without first providing notice to the participants and beneficiaries, the bargaining parties, the PBGC, and the Secretary of Labor (See IRC 432(e)(8)(C)). If the trustees determine that, after adopting all reasonable measures, they will not be able to recover in the statutory period, they must adopt a program that may take longer but that they believe is likely to work. If they believe that they cannot reasonably turn the situation around, they must design a plan to forestall insolvency.

⁷ Data on plans’ 2008 risk status are not currently available in the 5500 online data base. Data on risk status were collected from the pdf copies of 2008 schedule MBs that were submitted to the DOL by plans.

⁸ While many plans moved from yellow to green after the crisis, a plan in the green zone is not without risk of failure. In fact, 2 of the 3 largest “critical and declining” plans were actually in the green zone in 2010.

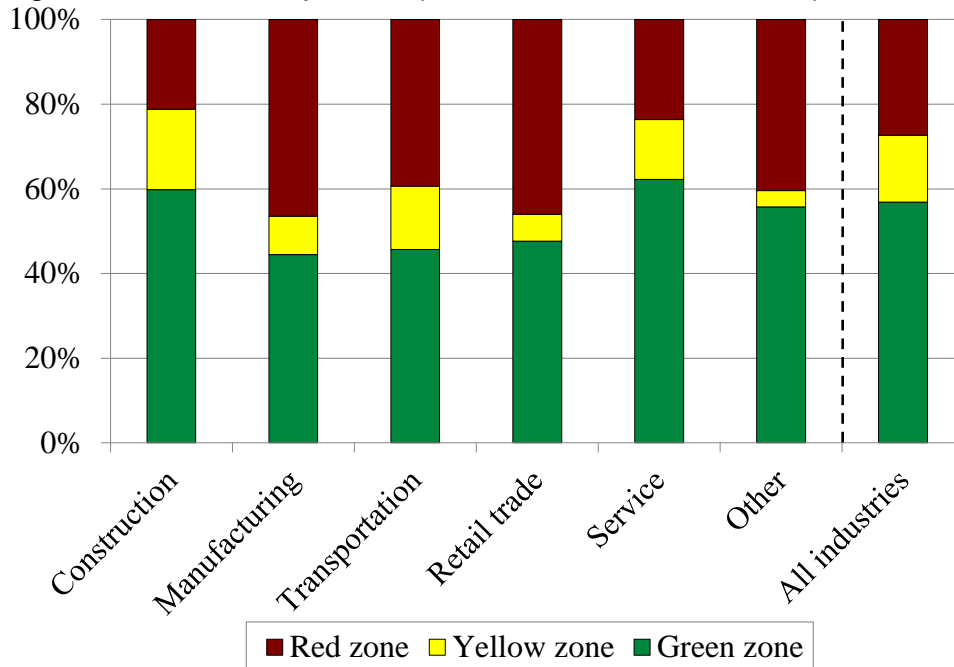
Figure 4. *Sample of Multiemployer Plans by Risk Status, 2008-2016*



Sources: U.S. Department of Labor, *Form 5500* (2008-2015); and U.S. Department of Labor (2017).

Figure 5 presents the current risk status of multiemployer plans, by industry. The construction industry is best off with only 21 percent of its plans currently in the red zone, 19 percent in the yellow, and 60 percent in the green. The manufacturing and retail industries are worst off, with red zone plans making up almost 50 percent of their plans. The service industry aligns closely with the overall average, with about a quarter of its plans currently in the red zone.

Figure 5. *Distribution of Plans by 2016 Risk Status and Industry, 2015*



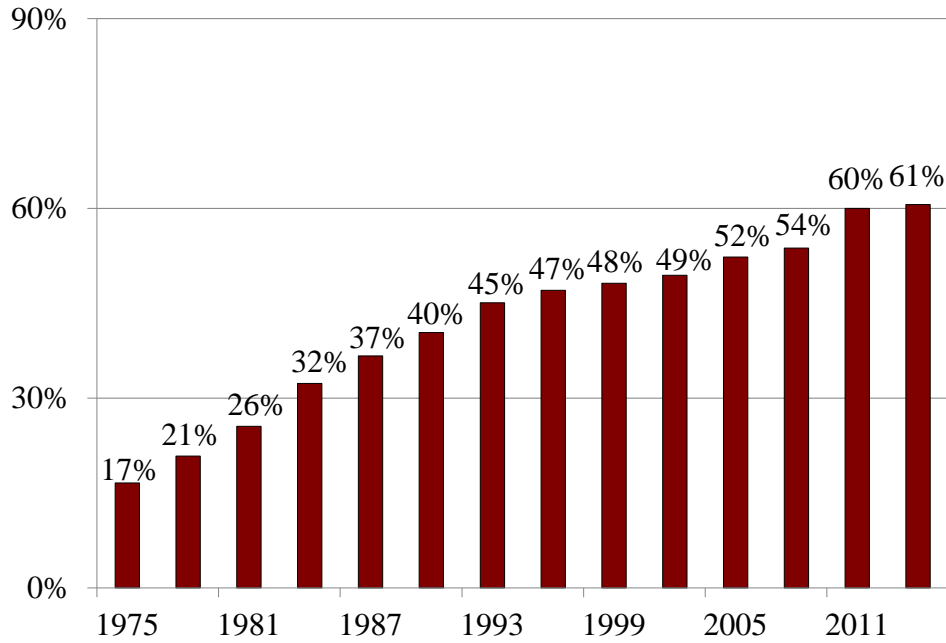
Sources: Authors’ calculations from U.S. Department of Labor, *Form 5500* (2015) using the PBGC’s industry codes for multiemployer DB plans; and U.S. Department of Labor (2017).

Structural Challenges

In addition to being buffeted by financial crises, multiemployer plans generally face three major structural challenges. First, the lack of new entrants leads to a very high percentage of inactive members. Second, withdrawal liability – the payments required when an employer exits a plan – is often inadequate so that orphaned participants – workers left behind when employers exit – create a burden for remaining employers. Finally, the construction industry, which supports the largest component of multiemployer participants, is highly cyclical.

Increasing Percentage of Inactive to Total Members. Inactive participants as a percent of total members has risen sharply in the past four decades, primarily because the number of new participants has increased only slightly (see Figure 6). In 1975, inactive participants represented 17 percent of total participants across multiemployer plans; by 2014, this share had increased to 61 percent. That is, most of today’s participants are older individuals who have accumulated substantial benefits under the plan and are now retired or close to retirement.

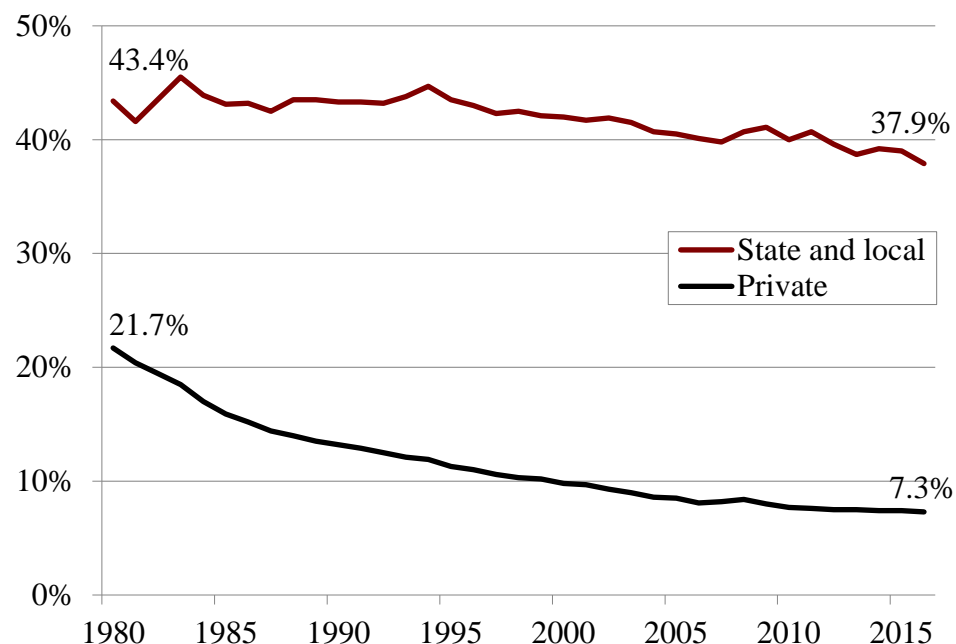
Figure 6. *Inactive Members as a Percentage of Total Members in Multiemployer Plans, 1975-2014*



Source: Author's calculations based on U.S. Department of Labor (2016b).

The reason for the slow growth in participants is twofold. First, private sector unions, which are prime movers behind multiemployer plans, have seen their membership drop from 22 percent of the workforce in 1980 to 7 percent in 2016 (see Figure 7). Second, many of the industries where multiemployer plans exist, such as manufacturing, have declined.

Figure 7. *Percentage of Wage and Salary Workers in Unions, 1980-2016*



Source: Hirsch and Macpherson (1980-2016).

These trends are unlikely to reverse. First, employers negotiating collective bargaining agreements are now reluctant to enter defined benefit plans, because they effectively are assuming some portion of the plan's unfunded liability. Even if a plan is currently fully funded, it exposes itself to future risk if market conditions deteriorate and the plan becomes underfunded as a result. And, second, some employers with a plan are strategically negotiating withdrawals, based on the conclusion that the plan will eventually become insolvent, and it is better to withdraw now before liabilities increase.⁹

Although both private-sector single-employer and state/local defined benefit plans have experienced similar increases in the proportion of inactives, this pattern is particularly challenging for multiemployer plans. This is because employers in a multiemployer plan simply negotiate a per-worker-cost with the union and do not actually promise retirement benefits to union workers (the union does that). As such, participating employers are less willing to pay the higher contributions per worker that are required to finance unfunded liabilities as the population shrinks.

⁹ U.S. Government Accountability Office (2013).

These mature plans are much more vulnerable to financial losses than plans with expanding contribution bases. Take the example of a plan with \$1 billion in assets that experienced a return of -10 percent instead of 7 percent. If the \$170 million (17 percent x \$1 billion) loss were amortized over 15 years, required contributions would rise by \$17 million per year to cover the shortfall.¹⁰ If the plan has 10,000 active workers, the required increase to amortize the actuarial loss would be \$1,700 per participant. If the plan had only 5,000 active workers, the annual contribution per active worker would have to increase by over \$3,000.

Inadequate Withdrawal Liabilities and Orphan Workers. Employers who participate in multiemployer plans are generally allowed to exit the plan at any time (subject to collective bargaining obligations). In this case, their orphan workers no longer accrue benefits but are entitled to vested benefits earned to date. To ensure the payment of benefits to these workers, the law requires exiting employers to pay a withdrawal liability to cover their share of the plan's underfunding (if any).

The withdrawal liability procedure, however, has serious limitations and often leaves the remaining employers burdened. First, up to 2000, when plans were typically fully funded, withdrawing employers did not face any liability when they left, even though financial markets collapsed shortly thereafter.¹¹ Second, in situations where unfunded liabilities did exist, collections could be minimal if employer exits were due to bankruptcies. Third, even in the absence of bankruptcy, when the withdrawal liability represents the employer's share of unfunded vested benefits, employer payments may not capture their full liabilities because the payments are based on past contributions rather than attributed liabilities and are capped by law at 20 years. Fourth, plans have the option to calculate an employer's withdrawal liability using the plan's funding rate, typically 7.5 percent, which may be fine for an ongoing plan but too high for a termination liability. Finally, under certain circumstances, special rules allow employers in the construction and entertainment industries to avoid any withdrawal liability.¹² To the extent

¹⁰ This analysis assumes a level-dollar amortization and 5.5-percent interest rate.

¹¹ Notably, the assets that had been collected to pay for the liabilities associated with withdrawn employers remained invested in risky securities, rather than being used to purchase an annuity to finance the liability.

¹² In the case of plans operating in the construction or entertainment industries, an employer is not required to pay a withdrawal liability if the employer is no longer obligated to contribute under the plan and ceases to operate within the jurisdiction of the collective bargaining agreement (or plan) or does not resume operations within five years without renewing its obligation to contribute. Slightly different rules apply to the trucking, household goods,

that withdrawing employers do not pay enough to cover the full cost of their workers who remain in the plan, the burden falls to the remaining employers.

Orphan participants constitute a significant share of total multiemployer participants. Based on the most recent 5500 data, orphans represent 1.6 million of the 10.7 million participants in multiemployer plans – about 15 percent. Not surprisingly, orphans constitute a much larger share of total participants for plans in the red zone than for those in the yellow and green zones (see Table 3).

Table 3. *Orphans as a Percentage of Plan Participants by 2016 Risk Status, 2015*

Risk status	Orphans	
	Number	Percentage of plan participants
Red zone	984,246	27.5%
Yellow zone	56,589	3.8
Green zone	572,770	10.1
Total	1,613,605	15.0

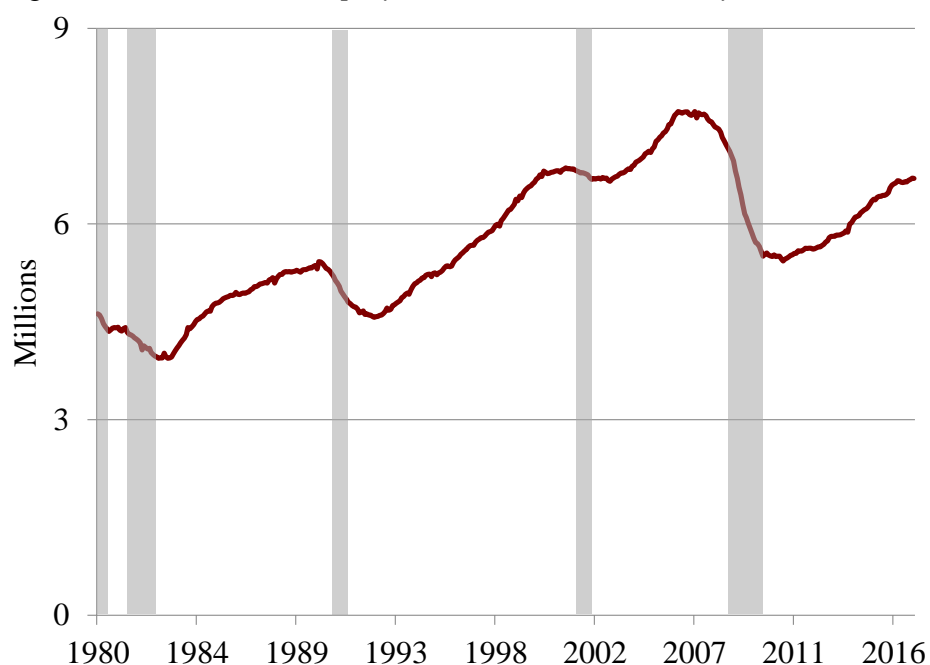
Notes: While the percentage of orphans in yellow zone plans appears surprisingly low, the values are consistent with 2010 data reported by the PBGC. About 25 percent of multiemployer plan membership resides in plans that provide no data on orphans, and this analysis assumes that these plans have no orphans. For this reason, the numbers shown above may underestimate the true number of orphans as a percentage of total members.

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor, "Critical, Critical and Declining, Endangered and WRERA Status Notices" (2017).

Cyclical Nature of Construction. Construction, which accounts for about 40 percent of the multiemployer participants and 55 percent of all plans, is highly cyclical (see Figure 8). Some multiemployer plans in this industry reported employment declines of 30 percent or more in the recent recession. For a fully funded plan, such a reduction in contributions would not be an issue, because less work means less accrued benefits for plan participants. But for a financially troubled plan, the contributions for each active worker cover not only the cost of the worker's future benefits but also a payment toward reducing the plan's unfunded liability. So, when the number of active workers declines, the unfunded liability tends to grow.

moving, and public warehousing industries and – for partial withdrawal – to the retail food industry. See McMurdy (2009).

Figure 8. *Construction Employment over the Business Cycle, 1980-2016, Millions of Employees*



Note: Shaded areas represent recessions.

Sources: Bureau of Labor Statistics (1980-2016); and National Bureau of Economic Research (2016).

In short, multiemployer plans, like other employer plans, have been challenged by two financial crises since 2000. While the majority of multiemployer plans are returning to financial health, a substantial minority face serious funding problems that are exacerbated by unique structural challenges – a declining ratio of active to total participants that increases the burden on underfunded plans, withdrawal penalties for exiting companies that are insufficient to cover the costs they leave behind, and cyclical employment patterns that interrupt the paying off of unfunded liabilities. The result of these financial and structural forces is a persistent group of distressed plans, some of which are projected to become insolvent in the foreseeable future. The question is how much money is required to cover the liabilities of these plans and who will provide that money – participants through benefit cuts, employers through increased contributions, or the public through increased taxes.

How Big Is the “Hole”?

The “hole” can be defined in a number of ways – the total unfunded liability of all 1,400 multi-employer plans, the unfunded liability of plans in the red zone, or the unfunded liability of the subset of red zone plans described as “critical and declining” under the Multiemployer Pension Reform Act of 2014 (MPRA).

As discussed earlier, the PPA required trustees, employers, and unions to look past funded ratios on a single date and take an active, forward-looking approach to managing their plans. Based on each plan’s assessment of its financial health over the next five or ten years, as noted, the PPA assigns them to one of three zones: red, yellow, or green.¹³ The other major innovation of the PPA is that it requires plans in the yellow or red zones to take corrective action (see Table 4).

Table 4. *Triggers and Required Action for Critical and Endangered Status*

Zone status	Criteria	Required action
<i>Yellow</i>		
Endangered	<ul style="list-style-type: none"> • Less than 80% funded <i>or</i> funding deficiency within 7 years. 	“Funding Improvement Plan” to close 1/3 of gap over 10 years.
Severely endangered	<ul style="list-style-type: none"> • Less than 80% funded <i>and</i> funding deficiency within 7 years. 	“Funding Improvement Plan” to close 1/5 of gap over 15 years.
<i>Red</i> Critical	<ul style="list-style-type: none"> • Funding deficiency within 4 years (5 years if less than 65 percent funded), <i>or</i> • insolvency within 5 years (7 years if less than 65 percent funded), <i>or</i> • liabilities for inactives greater than for actives; contributions less than normal cost plus interest on the unfunded liability and funding deficiency within 5 years. 	“Rehabilitation Plan” to get out of critical status within 10 years.

Notes: A plan’s status is determined at the start of the plan year and the criteria shown include the current plan year in their provisions. Alternatively, the criteria can be written excluding the current plan year and only reporting provisions for succeeding years, thus showing one fewer year for each criterion.

Source: Solis, Geithner, and Gotbaum (2013).

MPRA refined the classification of multiemployer plans in that it allows plans in “critical” status (that is, red zone plans) that are also in “declining status” to apply for benefit suspensions, partitions, and PBGC financial assistance and mergers. A plan is “critical and declining” if it is projected to become insolvent within 15 years (20 years if the ratio of inactive to active participants is more than 2 to 1 or if the plan is less than 80 percent funded).¹⁴

¹³ A plan has a funding deficiency if projections indicate that it does not have sufficient funds to meet the legislated minimum required contributions.

¹⁴ MPRA also requires plans in the yellow and green zones to project whether they will become critical and move to the red zone in the next five years. If so, the trustees can opt to be in the red zone in the current year. Moving early enables plans to take advantage of the special rules for red zone plans and to avoid both a Funding Improvement

Table 5 shows plans and participants in 2015, by their 2016 zone status. While only about one-quarter of plans are in the red zone, they cover around one-third of participants. The bulk of these participants work in three industries: transportation, services, and manufacturing.

Table 5. Multiemployer Plans and Participants by 2016 Risk Status, 2015

Risk status	Plans		Participants	
	Number	Percent	Number (millions)	Percent
Red zone	351	27.5%	3.6	33.3%
Critical and declining	102	8.0	1.2	11.1
Critical	249	19.5	2.4	22.3
Yellow zone	202	15.8	1.5	13.9
Green zone	725	56.7	5.7	52.8
All zones	1,278 ^a	100.0%	10.7	100.0%

^aThe number of plans reflects the total number of observations available for plan-level analysis in the Form 5500 database that have a known risk status.

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

For the plans in each category, Table 6 presents two measures of funded status and unfunded liabilities reported in DOL's Form 5500 – a current view and an actuarial smoothed view.¹⁵ The focus throughout this study is the current liability, even though the PPA classifications are based on the actuarial measure. The current value is the most conservative measure and the one used by the PBGC; if the liability is eliminated based on these assumptions, the problem is really solved. The current funded ratio overall for multiemployer plans is 46 percent. The 2015 funded ratio for those in the green zone averaged 53 percent; plans in the yellow zone averaged 41 percent; and those in the red zone averaged 37 percent.

Plan required of yellow zone plans and eventually a Rehabilitation Plan required of red zone plans. On the other hand, remaining in the current status provides plans with the freedom to solve their funding challenges outside the statutory framework associated with being a red plan. According to Segal Consulting (2016), in 2015 and 2016, only about a quarter of the plans that were projected to be in the red zone in the next five years opted to change their classification immediately.

¹⁵ As discussed, the actuarial view averages asset values over a period of time and uses the expected return on plan assets as the discount rate to value liabilities. The current view is based on the market value of plan assets and a liability calculated using a four-year average yield on 30-year Treasuries as the discount rate.

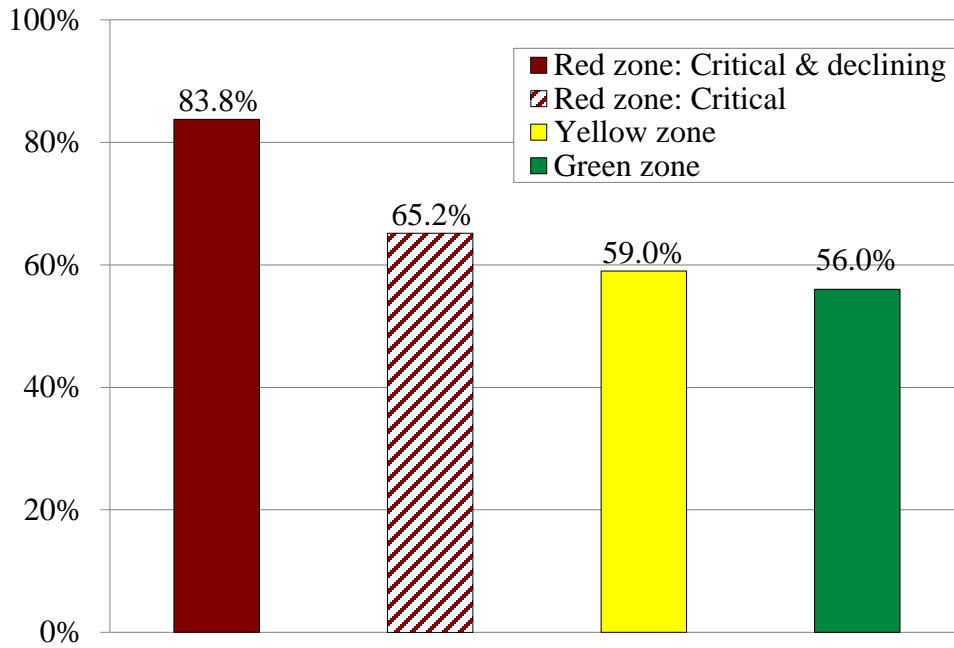
Table 6. *Funded Status of Multiemployer Plans by 2016 Risk Status, 2015*

Risk status	Assets as a percent of liabilities		Unfunded liabilities (billions)	
	Current	Actuarial	Current	Actuarial
Red zone	37.4%	61.6%	\$187.0	\$71.1
Critical and declining	35.3	53.7	75.9	35.3
Critical	38.7	67.1	111.2	35.8
Yellow zone	41.4	72.9	118.3	32.1
Green zone	53.3	89.4	248.0	34.3
All zones	46.4	78.1	553.4	137.6

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

As assets as a percent of liabilities for red- and yellow-zone plans are quite similar, funded status clearly is not the factor that distinguishes the two zones from one another. For that reason, the PPA requires plans to look ahead to where their finances are headed. The key determinant of those projections is inactive participants (retirees and vested members who are no longer employees of an employer contributing to the plan but are not yet receiving benefits) as a percentage of total participants. This percentage is key because union contracts generally set employer contributions to multiemployer plans on a per-employee basis, so a decline in actives means a decline in contributions, while an increase in retirees means an increase in benefit payments. With a large percentage of retirees, benefits exceed contributions; as that percentage increases over time, the source of contributions begins to disappear. Figure 9 shows that the percentage of inactives is the real differentiator between “critical and declining” plans and those in other zones. For “critical and declining” plans, inactives account for 84 percent of total members, compared to 65 percent or less for other groups.

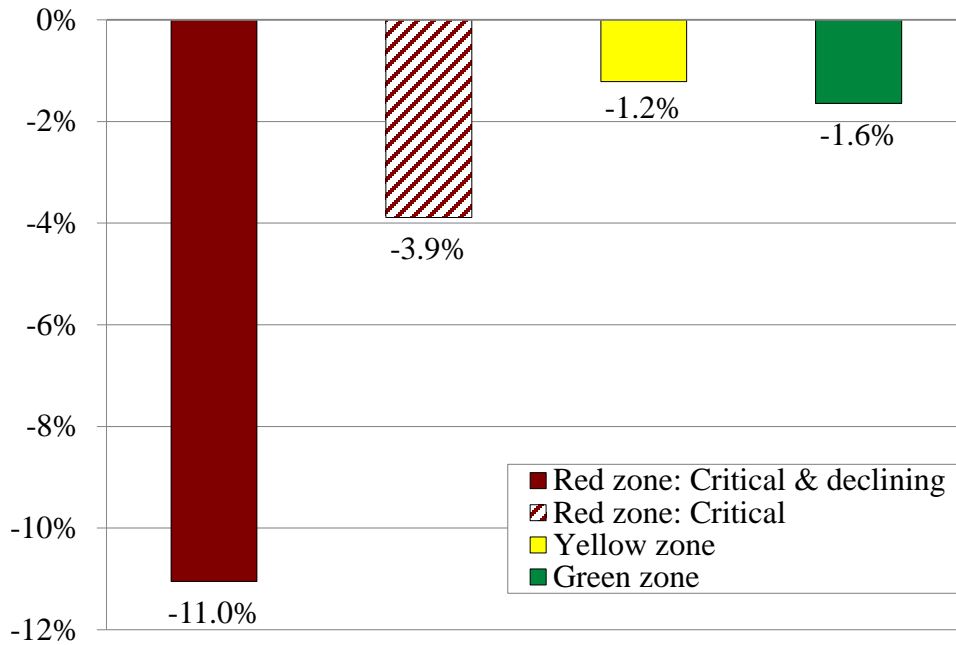
Figure 9. *Inactive Members as a Percentage of Total Members by 2016 Risk Status, 2015*



Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

Once benefits exceed contributions, cash flow is negative – more money is going out than coming in. Figure 10 presents cash flows (the difference between contributions and benefits) as a percentage of market assets. The pattern of cash flow by zone mirrors that of inactives as a percentage of total members, ranging from -11 percent of assets for plans categorized as “critical and declining,” compared to under -4 percent for other groups.

Figure 10. *Cash Flow as a Percentage of Assets by 2016 Risk Status, 2015*



Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

Negative cash flow is not a problem if a plan is fully funded and drawing down its accumulated assets to pay benefits. In that case, liabilities decline in step with assets, and the plan remains fully funded. However, if a plan is not fully funded – like many multiemployer plans today – a large negative cash flow causes assets to decline faster than liabilities. This dynamic is hastened by the fact that the gap between benefits and contributions tends to rise over time for mature plans. As a result, the plan falls into a downward spiral and assets are depleted before all promised benefits are paid.

Large negative cash flow rates are a serious problem for two well-known plans facing insolvency: the Central States Teamsters and the United Mine Workers (see Table 7). In each case, cash flow is at or below -13 percent. That means they are digging into assets each year to pay benefits and are projected to exhaust their assets within the next 10 years.

Table 7. *Central States and United Mine Workers Plans, 2015*

Plan	Zone	Funded ratios		Percent inactive	Cash flows			Expected return
		Actuarial	Current		Benefits (millions)	Contributions (millions)	(B-C) / assets	
Central States	Red	47.9%	33.0%	83.8%	\$2,814	\$587	-12.5%	7.5%
United Mine Workers	Red	66.7	39.8	92.1	622	55	-14.9	7.5

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

Central States Teamsters is one – and by far the largest – of the 15 “critical and declining” plans that have submitted applications to the Treasury (as of November, 2017) requesting to cut accrued benefits for current employees in order to stave off insolvency. In almost every case, the plan reports a high rate of negative cash flow – a rate in excess of the return they expect on their investments (see Table 8). The aggregate unfunded liability for plans that have applied to the Treasury for benefit reductions is \$45 billion, equal to approximately 60 percent of the total unfunded liability for all “critical and declining” plans. So far, five requests to cut benefits have been denied (including that for Central States Teamsters), four have been approved, one is under review, and five have been withdrawn.

Table 8. Key Statistics for MPRA Plans as of November 2017, 2015 Data

Plan name	Total participants	Percent inactive	Funded ratio		Current unfunded liability (millions)	Assumed return	Cash flow	Status
			Actuarial	Current				
Alaska Ironworkers Pension Plan	824	80.6%	58.7%	44.7%	\$70.4	6.3%	-9.1%	Withdrawn
Automotive Industries	25,834	84.4	60.3	41.6	1,830	7.3	-8.2	Denied
Bricklayers Local 5 New York	930	80.1	33.7	24.4	73	6.8	-13.8	Withdrawn
Bricklayers Local 7	484	70.0	49.4	29.0	43	7.8	-13.7	Withdrawn
Central States Teamsters	397,492	83.8	47.9	33.0	36,200	7.5	-12.5	Denied
Intl. Assoc. of Machinists Motor City	1,228	84.0	55.9	32.0	109	7.5	2.2	Approved
Iron Workers Local 17	2,015	66.8	32.4	23.2	283	6.5	-8.8	Approved
Ironworkers Local 16	1,183	71.4	63.1	44.4	108	7.0	-9.1	Denied
Local 805	2,065	76.2	43.3	27.8	161	6.8	-16.3	Withdrawn
New York State Teamsters	34,526	66.2	49.0	26.7	4,290	8.5	-10.3	Approved
Road Carriers Local 707	4,571	83.6	9.4	7.6	815	5.8	-62.4	Denied
Southwest Ohio Regional Council of Carpenters	5,614	69.0	59.9	33.3	442	7.5	-5.9	Withdrawn
Teamsters Local 469	1,822	91.8	60.3	43.3	158	7.3	-8.6	Denied
United Furniture Workers	10,110	89.4	38.5	24.4	220	6.8	-13.7	Approved
Western States Office/Professional Employees	7,781	87.0	65.8	44.8	443	7.3	-7.6	In review
Total	496,479				\$45,245			

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of the Treasury (2017).

In summary, the hole for “critical and declining” plans is \$76 billion, based on the current view of funding that uses the market value of assets and values liabilities using a four-year average yield on 30-year Treasuries for the discount rate. Of this amount, about \$45 billion is for plans that have already applied to the Treasury requesting the ability to cut accrued benefits for plan participants. For all plans in the red zone, both “critical” and “critical and declining,” the hole is \$187 billion. And, for all multiemployer plans, the hole is \$553 billion. Most multiemployer plans have taken remedial action and have put themselves on a sustainable path. However, the “critical and declining” plans face large negative cash flows and a potential death spiral. What options exist for addressing the underfunding in “critical and declining” plans and for distributing the burden of the \$76 billion shortfall among plan participants, employers, and taxpayers?

What Are the Options for Filling the Hole for “Critical and Declining” Plans?

At this stage, the majority of proposed solutions for addressing the crisis facing “critical and declining” plans, and multiemployer plans, generally entail the following: 1) alleviating the burden associated with orphan participants; and/or 2) providing subsidized loans.

Address the Orphan Problem

Three proposed solutions – the Keep our Pension Promises Act of 2015 (KOPPA) sponsored by Senator Bernie Sanders (I-VT) and Rep. Marcy Kaptur (D-OH), as well as two relatively similar proposals by Davey Grubbs of the of the North Carolina Committee to Protect Pensions (NCPPI) and Bernie Anderson of the Wisconsin Committee to Protect Pensions (WCPP) – involve shifting a portion of the liability for the worst off plans to the PBGC.

Experts have long suggested that the PBGC be given the authority and resources to head off insolvency by allowing partitions.¹⁶ A partition would allow a plan to transfer to the PBGC some of the liability for orphan participants whose employer has left the plan. This transfer would put the plan in a better position to fund ongoing costs with contributions.

MPRA gave plans that are deemed “critical and declining” the right to ask the PBGC to approve a partition.¹⁷ In order for a plan to be eligible for a partition, the sponsor must show that the plan has taken all reasonable measures to avoid insolvency (including applying the maximum the possible benefit suspensions allowed under MPRA) and that partition is necessary for the plan to remain solvent – that is, have the ability to pay benefits for all participants at levels above the small amounts guaranteed by the PBGC multiemployer program (see Box 1).¹⁸

¹⁶ U.S. Government Accountability Office (2013). As of 2013 the PBGC had performed only three partitions: the Council 30 of the Retail, Wholesale, and Department Stores Union plan in 2010; the Chicago Truck Drivers Union Pension Plan in 2010; and former Hostess Brands’ employees in the Bakery and Sales Drivers Local 33 Industry Pension Fund in 2014. In these cases, instead of administering payments for the orphaned participants, the PBGC provided the funding to the plan to cover the orphaned participants’ guaranteed benefits. More recently under MPRA, the application for a partition by the United Furniture Workers was approved. The Create Jobs and Save Benefits Act of 2010, which was not adopted, would have specifically authorized the use of partitions for plans meeting certain requirements.

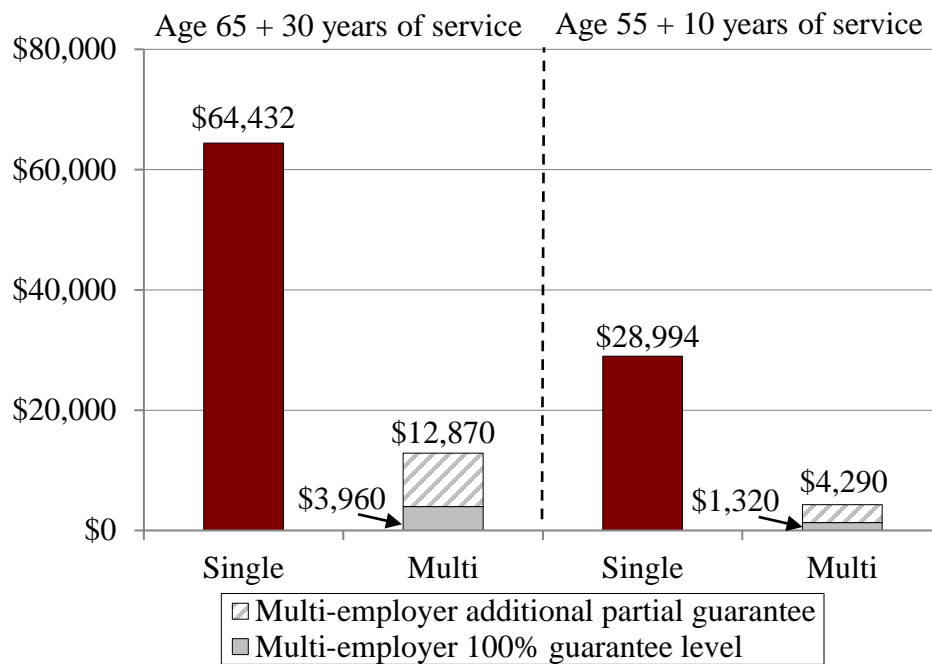
¹⁷ Before approving a partition, the PBGC has to certify to Congress that the partition will not impair the PBGC’s ability to pay current financial assistance.

¹⁸ Under MPRA, the PBGC has received four applications for partition; one has been denied, two have been withdrawn, and one has been approved.

Box 1. PBGC Guaranteed Amounts Are Very Low for Multiemployer Plans

The PBGC’s benefit guarantee for participants in multiemployer plans is significantly lower than for participants in single-employer plans. First, the stated guarantee is much lower. For an individual with 30 years of service in a multiemployer plan, the PBGC guarantees 100 percent of the pension benefit up to \$3,960 and guarantees 75 percent of benefits in excess of that level, up to \$12,870 (see Figure 11). By comparison, for single-employer plans, the maximum guaranteed in 2017 is \$64,432 at age 65, and it is actuarially increased for retirement after age 65. Second, the PBGC multiemployer guarantee is prorated based on years of service so that those with only 10 years of service are guaranteed 100 percent of the pension benefit up to only \$1,320 and 75 percent of benefits in excess of that level but only up to \$4,290. The single-employer guarantee does not change whether a participant has 10 or 40 years of service. Third, the PBGC guarantees are indexed for inflation in single-employer plans but not in multiemployer plans. Through 2015, about 80 percent of participants in terminated single-employer plans and insolvent multiemployer plans received their full vested benefits. But the PBGC estimates that only half of participants in multiemployer plans that will become insolvent in the future will receive full benefits.¹⁹

Figure 11. *PBGC Benefit Guarantees for Single-employer and Multiemployer Plans, 2017*



Source: PBGC (2017a).

Removing the burden associated with orphaned participants has some evident appeal; it has been clear for decades that the withdrawal liability procedure is flawed and bankrupt firms

¹⁹ PBGC (2015).

often pay little to nothing.²⁰ One could argue that it is unfair to burden current workers and their employers with legacy costs over which they had no control.

The partition approach, however, also raises some issues. Most importantly, the data on orphans is far from perfect.²¹ Second, if the case is so strong for removing orphans from multiemployer plans, why limit the relief to only “critical and declining” plans?

If the data were available, the analysis would be straightforward. Simply subtract from total liabilities the unfunded liability associated with each orphaned participant, and recalculate funded ratios and exhaustion dates. Unfortunately, data on orphan liabilities are not reported on the Form 5500 or anywhere else. The Form 5500 provides data on the number of orphans in each plan, but no information on how well each orphan is funded through the withdrawal liability paid by former employers, nor on the age and service of each orphan. Thus, a measure of orphan liabilities must be estimated based on the limited amount of data on plan orphans in the 5500.

The first step is to estimate the total liability associated with orphans. Since orphans are by definition inactives, orphan liability for each plan is calculated by multiplying the total inactive liability by the ratio of orphans to total inactives. This approach assumes that the average orphan is no different from the average inactive in a given plan. The second step is to estimate the share of orphan liability that would be transferred to the PBGC. (The plan would pay the remainder of the benefit owed to the orphan participant.) This calculation requires estimating the ratio of the PBGC guarantee for each plan to the plan’s average benefit and applying that ratio to the orphan liability. For example, in the case of the Central States Teamsters the average annual benefit is \$13,659 and the estimated PBGC guaranteed benefit is \$8,580, which means that the PBGC would take on 63 percent ($\$8,580/\$13,659$) of the orphan liability.²²

The results of these calculations are displayed in Table 9 for each zone. Eliminating the burden of orphans in the fashion described above for all “critical and declining” plans would cost \$35 billion – roughly half of the unfunded liability for this group. Extending this relief to all

²⁰ U.S. General Accounting Office (1985).

²¹ To reduce recordkeeping burdens, PBGC guidance permits plans to report as orphan participants those participants whose most recent contributing employer had withdrawn from the plan, even if an employer with whom the participant earned earlier service credit continues to participate in the plan. Alternatively, a plan may report as orphan participants those who have no former employers with a continuing obligation to contribute to the plan.

²² See Munnell et al. (2014d).

plans in the red zone would increase costs by another \$14 billion. Eliminating the burden of orphans for all multiemployer plans would cost about \$88 billion.

Table 9. *Cost of Providing the PBGC Guarantee for Orphaned Participants, 2015*

	Liability			Orphan Benefits			Orphan PBGC Costs
	1	2	1 x 2 = 3	4	5	5 / 4 = 6	3 x 6 = 7
Risk status	Inactive Liability (billions)	Ratio of Orphans to Inactive Members	Orphan Liability (billions)	Avg. Benefit	Avg. PBGC Guarantee	Ratio of PBGC Guarantee to Avg. Benefit	Liability for PBGC Guarantee (billions)
Red zone: All	\$191.6	42.3 %	\$69.8	\$7,342	\$5,173	70.5 %	\$49.2
Critical and declining	93.4	52.7	50.0	10,169	7,084	69.7	34.8
Critical	98.2	35.0	19.8	4,362	3,159	72.4	14.3
Yellow zone	119.8	9.0	11.4	15,304	8,012	52.4	6.0
Green zone	295.3	19.1	42.9	8,422	6,381	75.8	32.5
Total	606.7		124.1				87.7

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

Recognizing the burden that absorbing orphan liabilities would put on the PBGC, the proposals for partitioning also include additional revenue for the PGBC. Proposals by both the NCPP and the WCPP advocate for membership fees ranging from 1 percent to 5 percent of benefits, with higher fees paid by plans with more severe risk status. KOPPA focuses on changing certain tax laws – specifically the “like-kind exchange” and “minority valuation discount” provisions of the Internal Revenue Code – to come up with the additional revenue.

The key question is the impact that orphan relief would have on the financial status of “critical and declining” plans. To get an idea, Table 10 shows funded ratios and exhaustion dates for the 15 “critical and declining” plans that have applied for MPRA relief. The new funded ratio is simply the old one with liabilities reduced by the orphan relief. The new exhaustion date for each plan is calculated by reducing expected benefit payouts by the ratio of the liability assumed by the PBGC and the plan’s total liability.²³ As can be seen, for most plans where orphans account for more than 30 percent of total members, removing the orphan burden restores long-term solvency.

²³ The analysis uses the ratio of orphan liability to total liability – active, terminated vested, and retirees – because the projected benefit payouts include those that will be made to both current and future retirees.

Table 10. *Status of MPRA Plans as of June 2017 with and without Orphans, 2015 Data*

Plan	Orphans / total members	PBGC liability for orphans / liability	Funded ratio		Insolvency date	
			Orphans	No orphans	Orphans	No orphans
Alaska Ironworkers Pension Plan	80.6%	59.3%	44.7%	109.8%	2032	Never
Automotive Industries	0.5	0.4	41.6	41.7	2031	2032
Bricklayers Local 5 New York	NR	NR	24.4	24.4	2023	2023
Bricklayers Local 7	63.2	41.8	29.0	49.7	2025	Never
Central States Teamsters	52.6	32.3	33.0	48.8	2028	Never
Intl. Assoc. of Machinists Motor City	NR	NR	32.0	32.0	2025	2025
Iron Workers Local 17	NR	NR	23.2	23.2	2028	2028
Ironworkers Local 16	34.4	20.0	44.4	55.5	2035	Never
Local 805	40.3	30.2	27.8	39.9	2022	2027
New York State Teamsters	26.8	14.4	26.7	31.2	2031	Never
Road Carriers Local 707	24.7	12.4	7.6	8.7	2019	2019
Southwest Ohio Regional Council of Carpenters	NR	NR	33.3	33.3	2015	2015
Teamsters Local 469	84.1	52.3	43.3	90.9	2030	Never
United Furniture Workers	72.5	67.4	24.4	74.9	2022	Never
Western States Office & Professional Employees	20.0	16.2	44.8	53.4	2030	2036

Note: “NR” represents plan data that is not reported.

Sources: Authors’ calculations from U.S. Department of Labor, *Form 5500* (2015); and the U.S. Department of the Treasury (2017).

Provide Subsidized Loans

Two organizations, United Parcel Service (UPS) and the International Brotherhood of Teamsters (IBT), have suggested subsidized loans as a way to address the financial challenges facing multiemployer plans. Partially in response to their situation with Central States (see Box 2), UPS would have the government provide five-year, low-interest-rate loans to address the negative cash flows experienced by “critical and declining” plans. The IBT would establish a non-profit Pension Rehabilitation Corporation to structure loans – with government guarantees and private capital – to pay off pension legacy deficits for both multiemployer and single employer defined benefit plans. The following discusses each proposal in a little more detail.

The UPS Proposal. As discussed above, once unfunded plans hit high levels of negative cash flow, they enter a death spiral. UPS proposed low-interest loans aimed directly at the negative cash flow.²⁴ Loans would be made at a 1-percent interest rate and amortized over 30 years, but borrowers would pay interest only for the first five years. To be eligible for the loan, the plan's actuary must certify that the loan will correct the funding issue and can be repaid from investment earnings and a 20-percent reduction in benefits.²⁵ At the end of the five-year loan period, if the plan remains in "critical and declining" status, the shortfall is recalculated and a new five-year loan amount provided. If the plan is no longer in "critical and declining" status, then the loan principal begins to be repaid. Troubled plans may apply for up to three consecutive loans. At the end of the third loan cycle, the principal and interest on the loan begin to be repaid regardless of the plan's financial condition at that time.

²⁴ Loans would amount to the plan's projected "shortfall" over the next five years. The shortfall would equal five times the projected income from contributions and earnings minus the projected benefit payments. The earnings are based on projected assets multiplied by the statutory rate of return assumption.

²⁵ Benefits would be reduced so that the combination of lower liabilities and an infusion of cash would enable the plan to grow its asset base, which in turn increases future investment earnings to shore up cash flows. For both actives and those already receiving benefits, payments would be reduced 20 percent. Because the amount of the reduced benefit payments is not included when calculating the shortfall, the fund has the opportunity to improve its funded status through investment performance.

Box 2. UPS and the Central States Teamsters

UPS exited the Central States Teamsters plan in 2007, paying about \$8 billion in lump-sum payments. But, in the collective bargaining agreement with the International Brotherhood of Teamsters in which it negotiated its withdrawal, UPS agreed to a backstop whereby if Central States ever lawfully cut benefits, UPS would provide a supplemental retiree benefit. The company sought some protection from this commitment in the negotiations on MPRA, and the resulting legislation provided a tiered benefit-cutting arrangement whereby the benefits of UPS retirees would be cut only after: 1) the benefits of those associated with companies that did not pay their full employer withdrawal liability; and 2) the benefits of those associated with all other companies in the plan. The estimates appear to be that UPS would have been on the hook for \$3.2-\$3.8 billion under the plan proposed by the Central States Teamsters and about \$2 billion under the tiered benefit cut arrangement.

UPS has net income of about \$4 billion per year and stockholders' equity of about \$2 billion. It is unclear how much a required payment of \$2-4 billion would damage the company. Nevertheless, it is useful to look at the role of UPS as a contributor to multiemployer plans more generally. Table 11 shows that the company contributes more than 5 percent to 25 plans. In nine of those plans, UPS' share exceeds 75 percent and in 13 plans it exceeds 50 percent. The average size of these plans is about 10,000 participants. UPS also accounts for almost 40 percent of contributions to the large Western Conference plan with about 585,000 participants and 25 percent of contributions to the New England Teamsters plan with about 73,000 participants.

Table 11. *Multiemployer Plans with UPS Contributing 5 Percent or More, 2015*

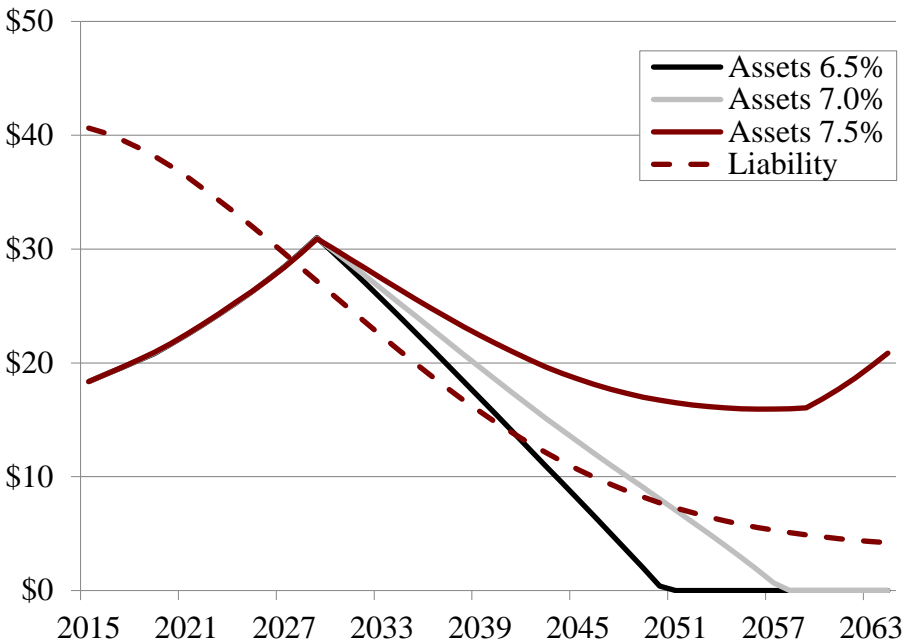
Plan status Plan name	Contribution share	Participants
Red zone: Critical & declining		
New York State Teamsters Conference Pension & Retirement	72.4%	34,526
Southwestern Pennsylvania & Western Maryland Area Teamsters	32.5	3,050
Automotive Industries Pension Plan	12.1	25,834
Red zone: Critical		
Local 177 IBT - UPS	100	7,805
Local 804 IBT and Local 447 IAM - UPS	99.4	10,832
Hagerstown Motor Carriers And Teamsters Pension Plan	82.5	1,735
Local 705 IBT	81.3	16,115
Employer-Teamsters Local No. 175 & 505	65.9	5,561
New England Teamsters & Trucking Industry Pension	24.9	73,221
Alaska Teamsters - Employer Pension Plan	13.6	9,352
Local 295/Local 851 IBT Employer Group Pension Trust Fund	10.6	5,085
Automotive Machinists Pension Plan	7.9	9,171
Yellow zone		
Teamsters Joint Council No. 83 of Virginia Pension Fund	91.2	7,652
Teamsters Negotiated Pension Plan	85.9	6,403
Truck Drivers & Helpers Local Union No. 355	75.1	4,180
Teamsters Pension Trust Fund of Philadelphia & Vicinity	30.7	26,143
Green zone		
Eastern Shore Teamsters Pension Fund	98.0	583
Milwaukee Drivers Pension Plan	96.9	4,385
Teamsters Local 639 Employers Pension Trust Fund	85.5	8,355
Hawaii Truckers Teamsters Union Pension Plan	85.1	992
IBT Union Local No. 710 Pension Fund	77.1	21,043
Central Pennsylvania Teamsters Defined Benefit Plan	56.0	29,838
Western Conference of Teamsters Pension Plan	39.7	591,619
District 9 International Machinists & Aerospace Workers	7.6	16,178

Source: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

If the UPS approach is to have a meaningful impact on the stability of the multiemployer system, the approach must be able to help the Central States Teamsters, the largest plan in “critical and declining” status. The following analysis relies on the CRR’s existing model for the Central States Teamsters to project contributions and benefits for the plan based on data and assumptions provided in the plan’s most recent actuarial valuation that was submitted with its

MPRA application.²⁶ The CRR model shows the path for market assets and liabilities under three return scenarios *assuming a 20-percent cut in benefits* (see Figure 12).²⁷ In all but the 7.5-percent-return scenario, the plan exhausts its assets.²⁸ Lower rates of return would require higher benefit cuts to keep the plan solvent. For example, an assumed rate of return of 6.5 percent would require a benefit cut of 29 percent to ensure solvency.

Figure 12. *Market Assets and Liability for Central States under Loan Program and 20-Percent Benefit Cut, 2015-2064*



Source: Authors' estimates.

²⁶ For further detail on the CRR model of Central States, please see Munnell et al. (2014d).

²⁷ Market Assets for the borrowing period (first 15 years) were calculated as:

Markets Assets $t+1$ = (Markets Assets t + Annual Contribution + Annual Loan amount) – (Reduced Annual Benefit Payments + 1% Interest Payment on loan) + Investment Return

Market Assets for the borrowing period (after the first 15 years) were calculated as:

Markets Assets $t+1$ = (Markets Assets t + Contribution) – (Unreduced Annual Benefit Payments + Annual Payment to payoff loan in 30 years) + Investment Return.

²⁸ For the first 15 years, the path for market assets is the same in all three scenarios, because the loan program is designed to make up for any cash flow shortfalls. After the first 15 years, when the loan program ends, under the lower-return scenarios the plan would have borrowed more, face higher loan repayments, and get lower investment returns than under the 7.5-percent scenario. As a result, assets decline more quickly. The projected liability, which is the same for all scenarios, declines rapidly because the incoming retiree population is shrinking. Also, the assumption is that new hires coming into the plan decline by 1 percent each year, so fewer and fewer new employees are entering the system.

The remaining issue is the cost of the loan program. If all loans were repaid, the cost would simply be difference in the present discounted value of the stream of interest paid at a market loan rate and the proposed 1 percent. The government would face a substantial expense only if the loans were not repaid. This risk could be minimized, however, by using a conservative investment return and benefit-cut assumptions at the outset. Extrapolating from the Central States example to the total for all multiemployer plans that currently have negative cash flows, the cost of the program would be about \$1.4 billion if the loans were repaid and about \$73 billion if the loans were not repaid.²⁹

*The IBT Proposal.*³⁰ The International Brotherhood of Teamsters loan proposal goes further than the UPS program by covering liabilities rather than just near-term negative cash flows. Under the current proposal, loans would be made directly to red-zone plans to pay for retiree liabilities and to employers participating in yellow and green zone plans to pay for the employer's portion of the plan's unfunded liability – much like a Pension Obligation Bond (POB).³¹ Plans that participate in the loan program would be asked to revise their plan designs and make changes to their investment strategies to reduce the probability of future unfunded liabilities.

As with the UPS proposal, the Central States Teamsters is a good litmus test for the effectiveness of this approach. Under the proposal, Central States would borrow an amount sufficient to cover its retiree liability, make interest-only payments for the first 29 years of the loan, and then repay the full loan amount in a balloon payment in year 30. Using the CRR's existing model for Central States, Figure 13 shows the funded ratio over time if the Central States Teamsters borrows \$23 billion – the actuarial value of retiree benefits – and realizes its assumed return of 7.5-percent. Under this rather optimistic return assumption, the CRR model shows that the loan immediately increases the plan funded ratio from 51 percent to 115 percent

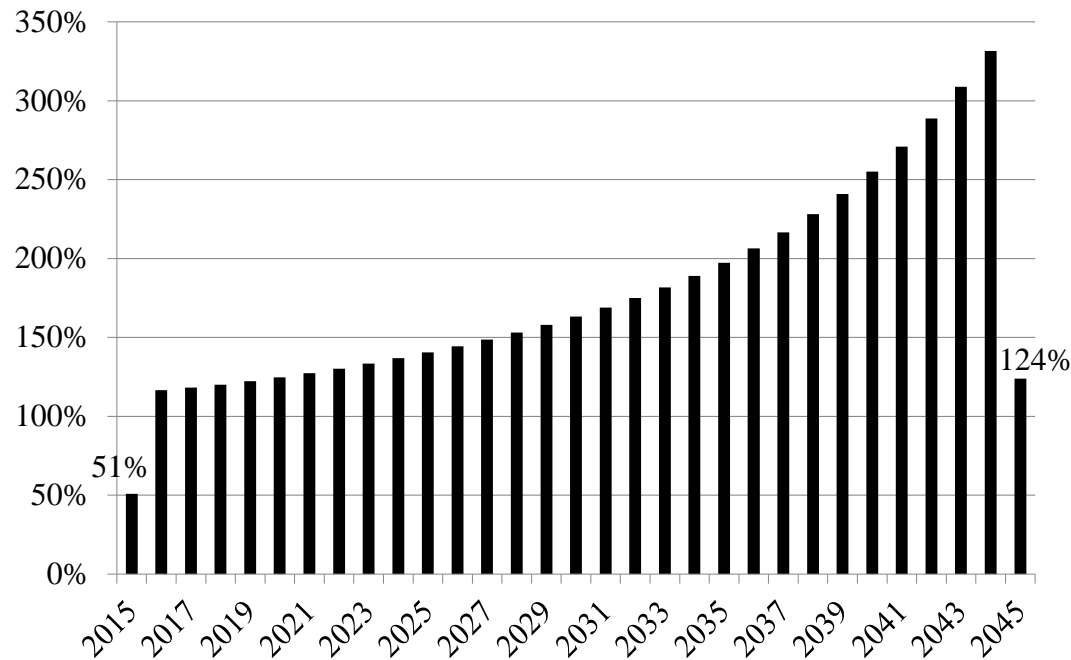
²⁹ To estimate the total loan amount for all multiemployer plans, the \$11 billion loan for Central States Teamsters (assuming it achieves its assumed return) is multiplied by 6.6 – the ratio of the total negative cash flow for all multiemployer plans in 2015 relative to that of Central States Teamsters in 2015. The analysis assumes a Treasury rate of 2.9 percent, based on the yield for 30-year Treasury bonds as of 5/31/2017. Interest cost on the loans is 1.9 percent, the difference between the Treasury rate and the 1-percent loan rate.

³⁰ Senator Sherrod Brown (D-OH) and Representative Richard Neal (D-MA) are expected to introduce a bill incorporating the basic approach and structure of the Teamster's loan proposal.

³¹ The International Brotherhood of Teamsters proposal also includes loans to employers that sponsor a single-employer plan.

and results in solvency over the 30-year loan period. In year 30, after the loan is repaid, the funded ratio drops to 124 percent, and the plan is projected to remain solvent indefinitely.

Figure 13. *Funded Ratio for Central States under the International Brotherhood of Teamsters Loan Program, 2015-2045*



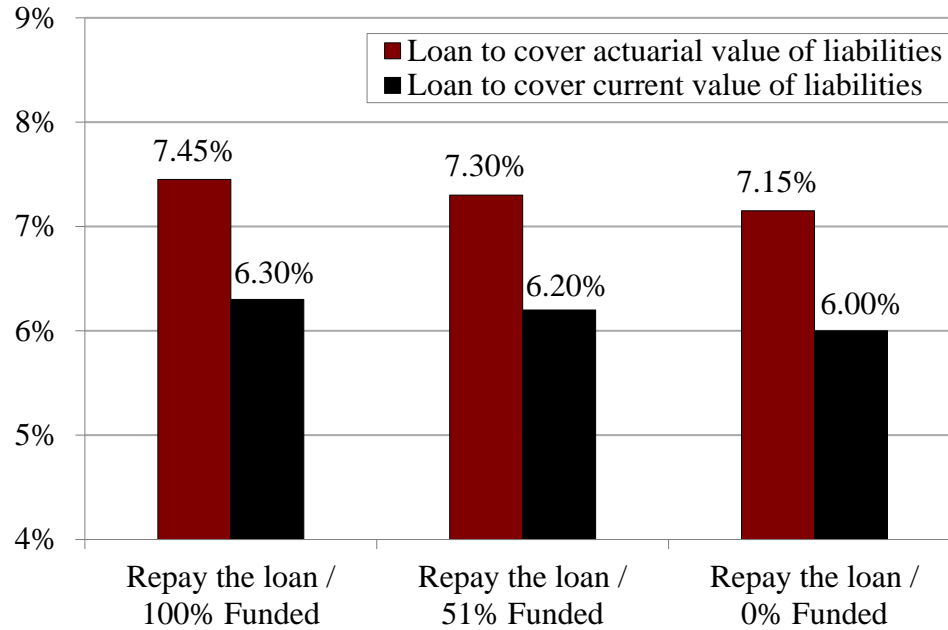
Source: Authors' estimates.

Not shown in Figure 13 is that if the Central States Teamsters earns less than 7.15 percent, the plan is unable to pay back the loan in full in year 30.³² To ensure loan repayment and subsequent improved funding, the loan amounts would need to be based on conservative valuations of the liabilities – meaning that a low interest rate should be used. Figure 14 shows the minimum investment return required to repay the loan and achieve various funded levels in year 30. If the Central States Teamsters borrows \$23 billion – the actuarial value of retiree liabilities (the value reported in the plan’s actuarial valuation based on a 7.5-percent discount rate) – the plan must realize at least a 7.45-percent return to be fully funded in year 30 after it repays the loan. If the Central States Teamsters instead borrows \$35 billion – the current value of its retiree liability (the retiree liability reported in the plan’s Schedule MB in the Form 5500 based on a 3.5-percent discount rate) – the plan would only need 6.3 percent returns to be fully

³² Other analyses have found that the program is successful at lower rates of return. The difference likely stems from more optimistic assumptions of future cash flow and liability growth.

funded in year 30. So, while valuing liabilities at a more conservative rate requires a larger initial loan, it decreases the minimum return required for the program to succeed.

Figure 14. *Minimum Annual Return Required for Central States Teamsters to Repay Loan and Achieve Various Funded Levels in Year 30*



Source: Authors' estimates.

The final issue is the total cost of the program. If all plans and employers were to take advantage of the program, loans would amount to the retiree liability of all red zone plans plus the unfunded liability of all plans in the yellow and green zones. The loans to plans are meant to immunize retiree liabilities, completely securing retiree benefits. Loans to employers are meant to cover the withdrawal liability – after the proceeds from the bonds are contributed to the pension fund, the employer is assured of no further contributions to pay for accrued liabilities (those earned for past service).³³ Using the conservative current value of liabilities, the total retiree liability of red zone plans plus the total unfunded liability of yellow and green zone plans amounts to approximately \$529 billion. Focusing just on the retiree liability of red zone plans, the loans would amount to \$160 billion.

³³ Employers will continue to make contributions for future service earned by plan members, but the proposal envisions reforms to benefits and funding that will limit the potential for unfunded liabilities related to these obligations.

Unlike the UPS plan, the IBT proposal does not intend for the federal government to lend directly but to instead guarantee the loans. The guarantee lowers the cost of borrowing for all participants in the program. While it may be desirable policy to reduce the burden of borrowing for small or struggling employers to save multiemployer plans, the guarantee has real costs to the government. The Office of Management and Budget (OMB) regularly values the cost of federal loan guarantees in areas such as home ownership, higher education, agriculture, and energy.³⁴ Additionally, the loan guarantee may benefit perfectly healthy employers, providing them an unfair advantage relative to competitors that do not participate in a multiemployer plan.

Who Should Bear the Burden of the Costs?

After considering options for filling the hole, the question then becomes who should pay for these initiatives. In the end, only three parties are available to bear the burden: 1) taxpayers – primarily through propping up the PBGC; 2) employers – through some form of increased contributions or increased PBGC premiums; and 3) plan participants – through some sort of benefit reductions. Currently, the PBGC does not have the resources to serve as a safety net for these plans.

Inadequate PBGC Resources to Rescue “Critical and Declining” Plans

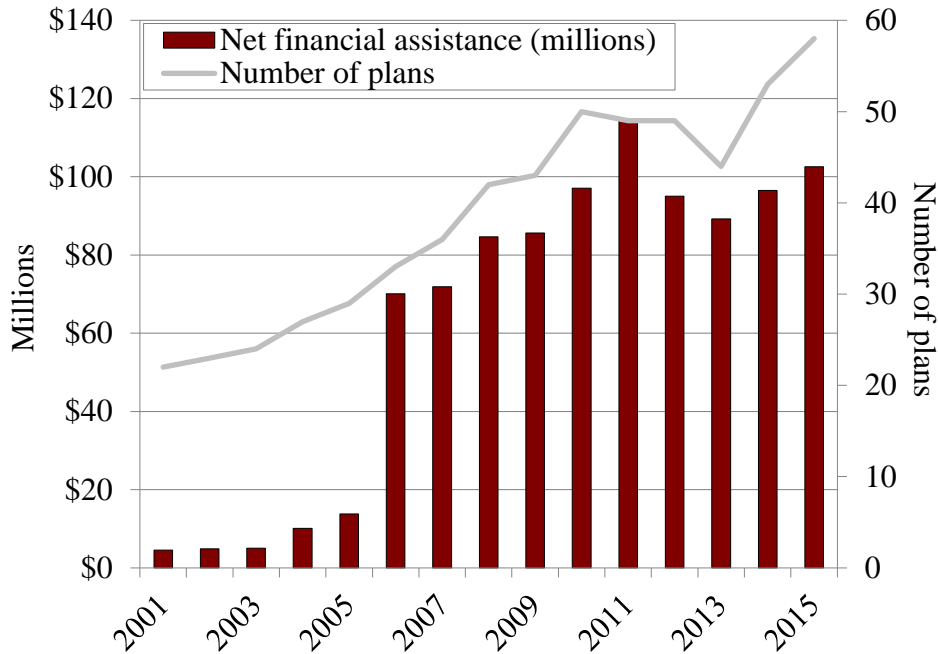
PBGC assistance to multiemployer plans has increased sharply since the turn of the century (see Figure 15).³⁵ Loans to insolvent plans account for the bulk of payments, but the PBGC has also helped a few partitions in the past.³⁶ A small amount of funds in 2011 also went to help plan sponsors merge their plans, which can reduce administrative costs.

³⁴ Bickley (2012).

³⁵ PBGC (2014).

³⁶To date, the PBGC has performed only three partitions: the Council 30 of the Retail, Wholesale, and Department Stores Union plan in 2010; the Chicago Truck Drivers Union Pension Plan in 2010; and former Hostess Brands’ employees in the Bakery and Sales Drivers Local 33 Industry Pension Fund in 2014. In these cases, instead of administering payments for the orphaned participants, the PBGC provided funding to the plan to cover the orphaned participants’ guaranteed benefits (PBGC, 2015).

Figure 15. *Multiemployer Plans Receiving PBGC Financial Assistance and Amounts Received, 2001-2015*



Note: This figure represents periodic payments made to insolvent plans by the PBGC. Periodic assistance payments include payments following a plan partition. Not pictured are one-time or non-periodic payments to purchase annuities or to facilitate a merger.

Source: PBGC (2014) and PBGC (2015).

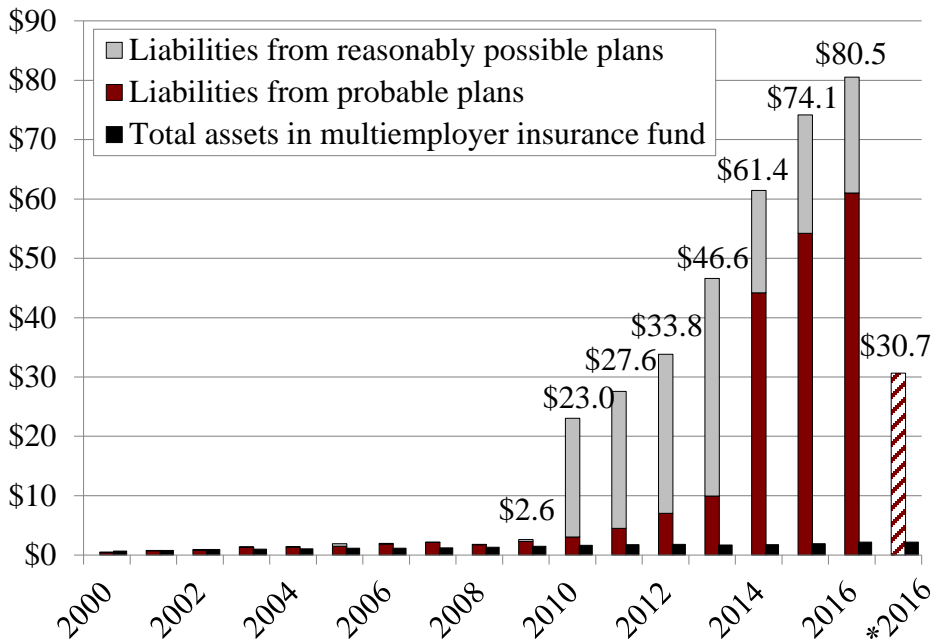
The PBGC projects its finances into the future in terms of both “probable” and “reasonably possible” insolvencies. Probable plans fall into three categories: 1) plans where PBGC payments have already begun; 2) terminated plans where benefits exceed assets plus revenues; and 3) ongoing plans that are likely to terminate in the next 10 years.³⁷ The “reasonably possible” plans are ongoing entities with a projected insolvency date between 10 and 20 years of the valuation. Figure 16 shows a big switch in 2014 reflects the Central States Teamsters and United Mine Workers being downgraded from “reasonably possible” to “probable.”³⁸ Figure 16 also shows that the liability facing the PBGC as a result of both “probable” and “reasonably possible” insolvencies has increased sharply since the financial crisis, and these amounts now dwarf the assets in the PBGC’s multiemployer insurance fund.³⁹

³⁷ A plan can terminate by mass employer withdrawal or by plan amendment. A mass withdrawal termination occurs when all employers withdraw or are no longer obligated to contribute to the plan. A plan amendment termination occurs when the plan stipulates that participants will receive no credit for service after a specified date.

³⁸ PBGC Annual Report (2014).

³⁹ PBGC (2014; 2000-2016).

Figure 16. PBGC Assets in Multiemployer Insurance Fund and Liabilities from “Probable” and “Reasonably Possible” Plans, 2000-2016, Billions



Note: The *2016 bar represents the estimated PBGC liability remaining after removing the liability of the 15 MPRA plans and United Mine Workers.

Sources: PBGC (2014; 2000-2016).

The PBGC also makes projections for the next decade and beyond using its Multiemployer Pension Insurance Modeling System, running 500 simulations of the economy and how plans react.⁴⁰ The most recent results for this model – assuming no plans elect suspensions or partitions – show that the PBGC’s multiemployer program has a mean 10-year projected deficit (present value of projected benefits minus assets on hand and present value of future contributions) of \$58.6 billion and is more likely than not to be insolvent by 2025.

Once the PBGC’s multiemployer fund is exhausted, the PBGC would have to rely on annual premium receipts and would be forced to pay only a fraction of its paltry guaranteed benefit. One estimate is that a retiree who once received a monthly benefit of \$2,000 and whose benefit was reduced to \$1,251 under the PBGC guarantee would see the monthly benefit decline to \$125 after the PBGC multiemployer fund is exhausted.⁴¹

⁴⁰ PBGC (2016).

⁴¹ U.S. Government Accountability Office (2013).

Given the financial constraints facing the PBGC's multiemployer program, it is important to consider alternative sources of relief.

Increased Contributions from Employers

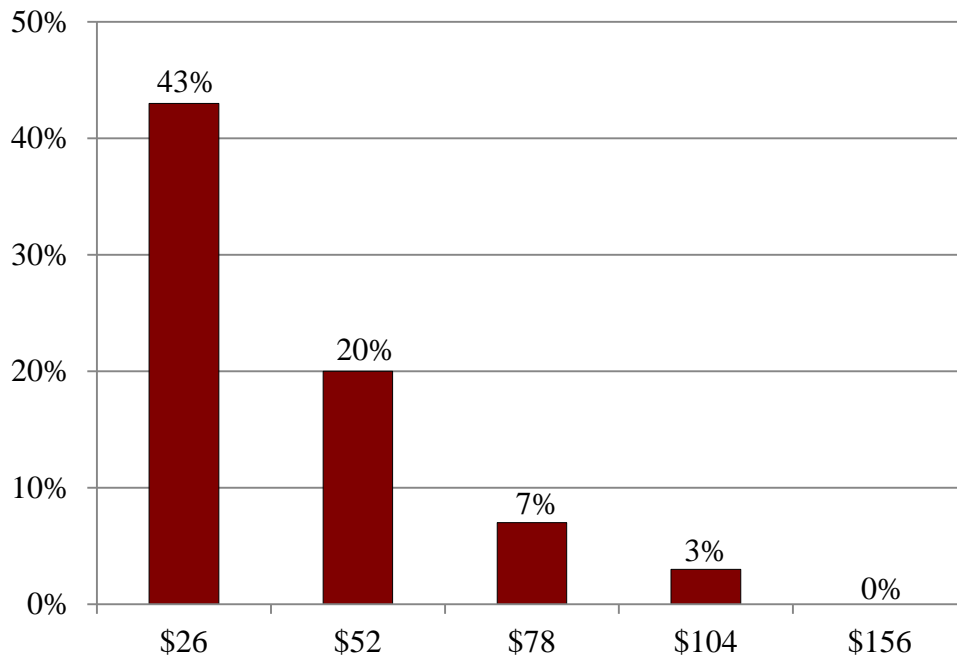
Since by law the PBGC's insurance programs must be self-supporting – without some exogenous source of money – additional resources would most likely come from raising employer premiums. In 2017, multiemployer plans pay an insurance premium of \$28 per participant to the PBGC, while single-employers pay \$69.⁴² Both premiums are indexed for inflation. In addition, single-employer plans pay a variable rate premium of \$34 per \$1,000 of unfunded vested liabilities, with a cap of \$517 per participant. Multiemployer plans do not pay an additional variable rate premium.

The most recent estimates – based on 2014 data – suggest that the required increase in premiums to forestall insolvency (assuming no future suspensions or partitions) would be substantial. Doubling the PBGC insurance premium from \$26 (the 2015 premium) to \$52 would reduce the likelihood of 10-year insolvency from 43 percent to 20 percent; a six-fold increase to \$156 would reduce the probability to zero (see Figure 17).⁴³ But, even then, the PBGC would have a deficit of \$31 billion 10 years hence.

⁴² PBGC (2017).

⁴³ PBGC (2016b).

Figure 17. *By Premium Level, Probability of Multiemployer Program Insolvency by 2024*



Source: PBGC (2016b).

While current premiums are not a significant percentage of plan costs, premiums of \$156 could place a burden on severely underfunded plans where employers have already seen substantial contribution increases. Adding this increase to what employers are already paying for their rehabilitation plan may be enough to induce more employers to withdraw.

The Central States Teamsters plan provides a good example of the fragility of some major contributors. Three companies in the plan that contribute more than 5 percent – ABF Freight System Inc., Jack Cooper Transport Company Inc., and YRC Inc. – have very low profit margins, and their debt is classified either as junk or slightly above (see Table 12). These employers may not be in a position to pay higher PBGC premiums. If these companies should go bankrupt, they would harm the finances of not only the Central States but also the other plans to which they are major contributors (see Table 13). In short, any increase in employer PBGC premiums – without offsetting steps to alleviate financial pressures – would have to be carefully tailored to avoid accelerating the death spiral of “critical and declining” plans and pushing other red-zone plans into that category.

Table 12. *Employers Contributing 5 Percent or More to Central States Teamsters, 2015*

Employer Name	Contribution share to Central States	Financial information (Parent company)	
		Profit margin	Bond rating
UPS	N/A	5.63%	A1
ABF Freight System, Inc.	13.2%	0.69%	Baa1
Jack Cooper Transport Company, Inc.	5.2%	N/A	Ca
YRC Inc.	5.3%	0.46%	B3

Note: ABF Freight System, Inc. is the major subsidiary of ArcBest Corporation, and YRC Inc. is the major subsidiary of YRC Worldwide Inc.

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); 2016 10-K Annual Reports; and Moody's Investors Service (2014-2016).

Table 13. *Contributions of Central States' Top Employers to Other Multiemployer Plans, 2015*
 ABF Freight System, Inc.

Plan status	Firm's share of total plan contributions	Participants
Plan name		
Red zone: Critical & declining		
Road Carriers Local 707 Pension	33.8%	4,571
Fund Freight Drivers & Helpers Local 557	33.7	2,764
Trucking Employees Of North Jersey Pension Fund	6.3	6,853
Red zone: Critical		
Hagerstown Motor Carriers & Teamsters Plan	5.5	1,735
Pension Fund Local 445	3.5	3,409
Green zone		
Western Conference of Teamsters Supplemental Plan	46.2	33,066
Central Pennsylvania Teamsters Defined Benefit Plan	20.5	29,838
International Brotherhood of Teamsters Local 710	7.2	21,043
Pension Plan of the Welfare and Pension Mid-Jersey Trucking	5.9	2,067
Jack Cooper Transport Company, Inc.		
Plan status	Firm's share of total plan contributions	Participants
Plan name		
Red zone: Critical & declining		
Freight Drivers & Helpers Local 557	24.4%	2,764
Trucking Employees of North Jersey Pension Fund	3.6	6,853
YRC, Inc.		
Plan status	Firm's share of total plan contributions	Participants
Plan name		
Red zone: Critical & declining		
Management-Labor Pension Fund Local 1730 ILA	66.4%	533
Teamsters Local 641 Pension Fund	27.2	4,038
I.A. of M. Motor City Pension Fund	1.6	1,228
Green zone		
Western Conference of Teamsters Supplemental Plan	24.8	33,066
Pension Plan of the Welfare and Pension Mid-Jersey Trucking	8.0	2,067

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015).

Reduced Benefits for Participants

If nothing is done, the burden of the shortfall in “critical and declining” plans will fall on participants. These plans can pay benefits for roughly the next 10-15 years, but then they will exhaust their assets and will be forced to stop paying benefits. That is, benefits for those in retirement and approaching retirement will drop to the level of the PBGC guarantee – assuming

the PBGC has enough resources to satisfy that commitment. Trying to avoid this scenario – particularly as it applied to the Central States Teamsters – was a major motivation for the passage of MPRA in 2014.

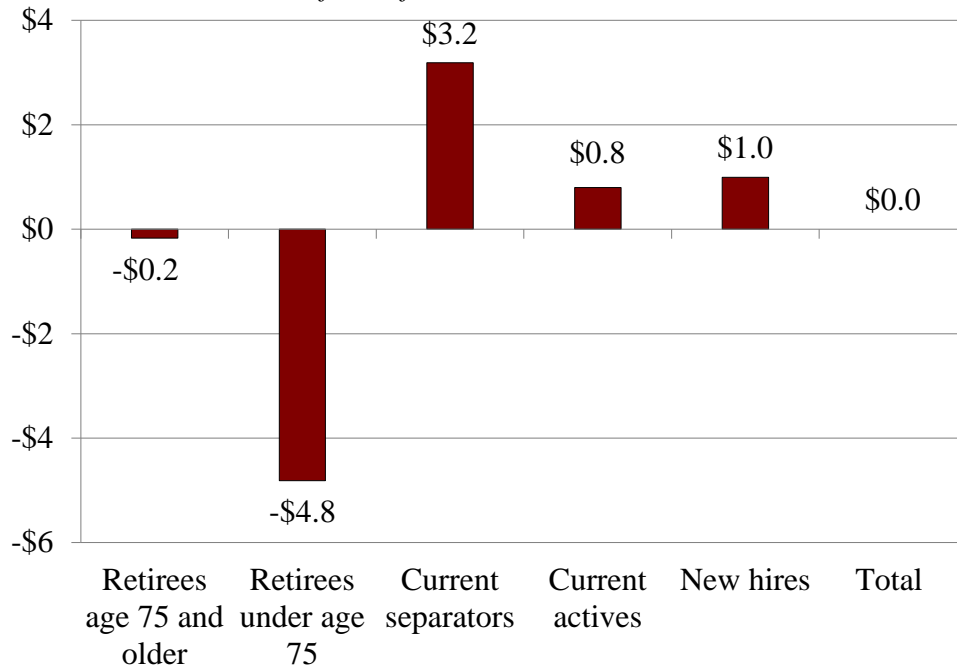
The notion behind MPRA was that the overall welfare of participants would be higher in a world where accrued benefits of all participants were reduced in order to return the plan to solvency. Indeed, a welfare analysis of the Central States Teamsters pension fund performed by the CRR shows that, in the aggregate, participants are better off if the plan avoids insolvency by cutting the accrued benefits of all participants than if the plan exhausts its assets in 10 to 15 years.⁴⁴

The CRR analysis requires first projecting benefits that will be paid to Central States members under the current arrangement – the base case – and under one that reduces accrued benefits for existing workers and retirees. Under the base case, the pension fund becomes insolvent in 11 years and active workers accrue no further benefits. After insolvency, the assumption is that employers pay withdrawal liability in the form of continuing contributions. The base case is then compared with one where the benefits of active, separated, and retired participants are cut by 30 percent – the average cut required to ensure solvency for the plan.

Figure 18 shows the impact of the benefit cut on the present value of benefits for five specific groups. Compared to the base case, the reform does not change the total expected present value of benefits, but – by spreading the pain – it does affect the outcome for different groups. The expected present value of (mostly younger) retirees' benefits declines substantially, while the present values of the lifetime benefits payable to current participants and new hires all increase.

⁴⁴ A welfare analysis allows one to measure the economic value that a change creates for those affected. Crucially, it assumes that a unit of change means more to some individuals than others. For example, if individual A has low income – and therefore high marginal utilities of consumption – relative to individual B, then the increase in utility that individual A experiences by receiving a dollar from individual B exceeds the welfare loss that individual B experiences from giving away that dollar. In that way, total welfare for the two individuals has been increased, even though the total amount of money between the two has not changed.

Figure 18. *Impact of “Spreading the Pain” for Central States Teamsters Plan Compared to Base Case on Present Value of Benefits, Billions*



Source: Munnell et al. (2014d).

Simply comparing the present value of benefits under the status quo and the benefit cut, however, may provide a misleading indication of the effect on the total welfare of plan participants. For welfare, it matters how much people value their benefits. For example, if current retirees have low incomes – and therefore high marginal utilities of consumption – relative to future retirees, then the welfare losses they experience from benefit cuts may exceed the welfare gains of future retirees, and total welfare will decline, even though the total present value of benefits increases.

Applying a welfare analysis alters the picture.⁴⁵ While retirees see their benefits decline in net present value terms, their welfare under a MPRA-type approach – in the aggregate – is essentially unchanged (see Table 14). The reason is that retirees receive smaller but steady benefits, which allows them to better smooth consumption over their lifetimes.

⁴⁵ The welfare analysis assumes that preferences are represented by a conventional utility function with diminishing marginal utility. This assumption means that the first unit of consumption yields more utility than the second and subsequent units. The actuarial model uses a constant 7.5-percent nominal return and does not incorporate investment risk.

Table 14. *Impact of “Spreading the Pain” for Central States Teamsters Plan Compared to Base Case on Present Value of Benefits and Welfare*

Member type	Impact	
	Present value	Welfare
Retirees		
Age 75 and older	-	No change
Under age 75	-	No change
Current separators	+	+
Current actives	+	+
New hires	+	+
Total	No change	+

Source: Munnell et al. (2014d).

To get a sense of whether the increase in aggregate welfare is meaningful or not, it can be expressed in terms of a lump-sum payment to all participants. The approach is to essentially reduce the benefits of those who enjoy an increase in utility until the total level of utility for the population as a whole equals that of the status quo. The present value of these benefits is then distributed among all the participants as a lump sum.⁴⁶ It turns out that the overall welfare gain is equivalent to each participant receiving about \$3,000.⁴⁷

The welfare analysis not only shows how a policy option might affect the different parties but suggests that participants – a group likely to gain from the continuation of the plan – should be willing to shoulder some of the burden. This burden sharing could take the form of either direct benefit cuts or, as proposed by those advocating for PBGC partitions, some type of membership fee.

Higher Taxes

The assumption throughout the policy debate about multiemployer plans has generally been that Congress was not going to allocate any money to solve the problem. It was on that basis that the National Coordinating Committee for Multiemployer Plans (NCCMP) in its 2013 report, “Solutions not Bailouts,” proposed allowing plans facing insolvency to reduce accrued

⁴⁶ An alternative, which yields a similar result, is to make equal percentage cuts in all members’ post-reform benefits until post-reform utility has been reduced to the pre-reform level.

⁴⁷ Maintaining solvency also brings additional benefits to participants not incorporated in the analysis, such as mortality risk pooling and professional investment management.

benefits for current workers and retirees. The question is whether any rationale exists for taxpayer support.

The results of recent MPRA applications suggest that cutting benefits alone may not be sufficient for restoring solvency for some of the most troubled plans. As noted earlier, despite the welfare-enhancing potential of benefit cuts, Treasury turned down Central States' application. One of the key reasons for the rejection was that Treasury was unconvinced – given the sensitivity of outcomes to the assumed rate of return – that the proposed benefit cuts would ensure the solvency of the plan – a key requirement of the legislation. Without an infusion of money, Central States will become insolvent and 400,000 people will lose some or all of their promised benefits. The insolvency of Central States Teamsters would drain much of the PBGC's multiemployer reserves, potentially cutting participants benefits far below the guarantee levels. The fact that Central States, and perhaps most of the other plans in “critical and declining” status, cannot cut their way out of trouble argues for an infusion of revenue.

One argument for tax revenue is that many of the retirees and inactive vested participants are orphans who worked for companies that are no longer in the plan. As a result, companies and workers still in the plan are being asked to pay not only their own costs but also the funding shortfalls of others. Employers in the most distressed plans have increased their contributions. But when orphans account for more than half of total participants – as is the case for the Central States – the burden can become intolerable and more employers may negotiate to leave, further eroding the contribution base and potentially creating additional orphans.

Thus, while increasing taxes is never popular, rationales exist for taxpayer money to be part of a broader solution that covers not only those classified as “critical and declining” but also those heading for trouble.

Possibility of Further Decline

This section identifies the key characteristics of plans that have ended up as “critical and declining” and presents historical data to see when their paths diverged from those of healthier plans. It then uses this information as well as a simple cash flow model to see if other plans are likely to become “critical and declining” in the near future. Finally, it takes a closer look at the 20 largest multiemployer plans to determine whether another situation like Central States Teamsters is on the horizon.

Identify Characteristics of “Critical and Declining.”

The key to assessing whether additional plans will fall into the “critical and declining” category – absent another major financial crisis – is to extract from the MPRA filings the factors identified by the plans themselves as contributing to their current status and to understand the characteristics of plans currently in that category.

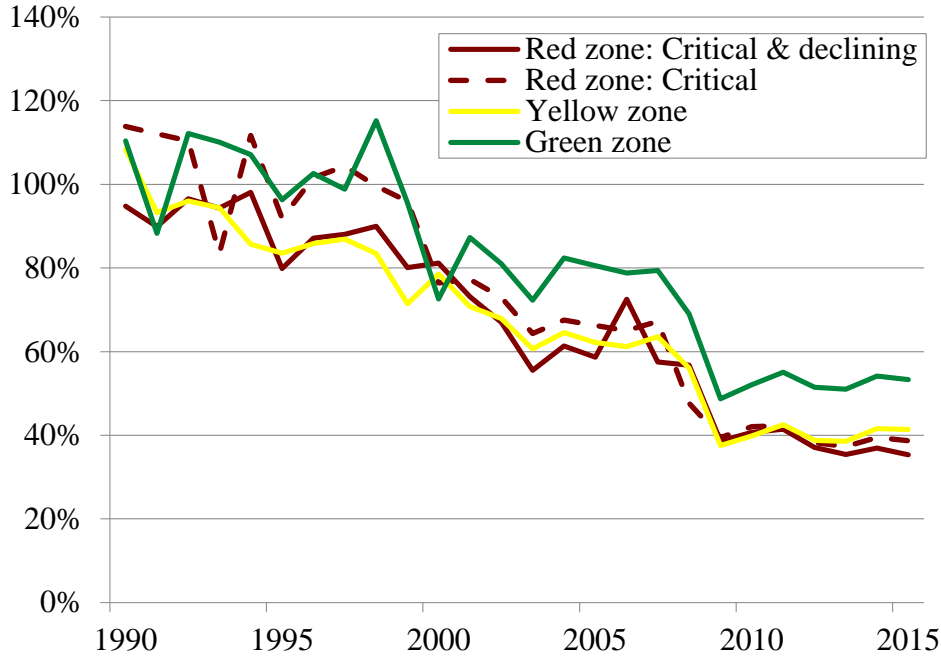
Reasons Offered by MPRA Plans for Their Situation. Appendix Table A1 documents key factors that the plans themselves highlight as reasons for their decline. Unsurprisingly, almost all plans report that the financial downturn in 2002 and the crisis in 2008 and 2009 are major factors in their decline, in addition to the broader decline in unionization. The teamsters and trucking-related plans cite the deregulation of trucking in 1980, while the United Furniture workers cite the rapid increase in competition from furniture makers abroad. Seven of the plans – Central States, Road Carriers 707, Iron Workers 16, New York State Teamsters, Automotive Industries, International Association of Machinists Motor City, and Western States Office and Professional Employees – also cite the financial decline of major employers as a key factor contributing to their current situations. Interestingly, eight of the 15 plans serve locally based unions that rely on the economic viability of small areas. This situation can be risky for a plan because it is not well protected against a regional economic downturn that might decrease its funding base. These histories suggest a number of characteristics that one would expect to be associated with being in “critical and declining” status.

Characteristics. The next step is to look at some key characteristics – funded ratio, inactives as a percentage of total members, cash flow rate, percentage of ARC paid, and orphans as a percentage of total employees – for those in each zone in 2016 to see if their levels have been significantly different over time. The trends provide a window into how plans arrived at their current status. Persistent differences between the groups help identify the potential precursors to trouble, and differences that emerge later may help explain why some plan saw such dramatic changes in their outlook. The results are shown in Figures 19 through 23.

Figure 19 depicts the funded ratio of plans classified by their 2016 zone status. As recognized in the PPA, past funded ratios indicated little about where plans were headed. Those

ending up “critical and declining” were only slightly less funded both before and after the financial crises than those ending up in the green zone.

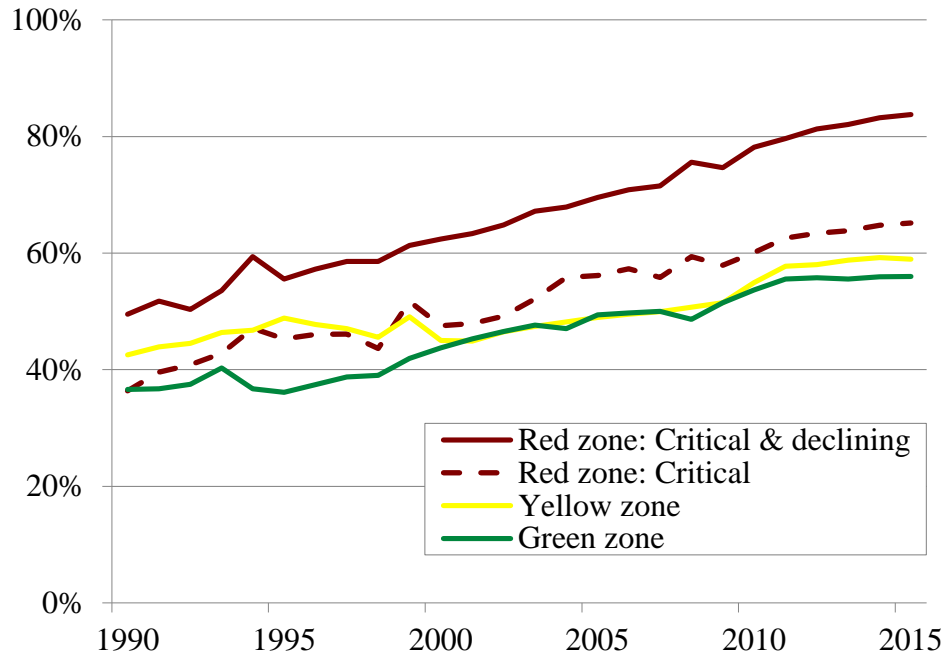
Figure 19. *Funded Ratio by 2016 Risk Status, 1990-2015*



Sources: Authors’ calculations from U.S. Department of Labor, *Form 5500* (1990-2015); and U.S. Department of Labor (2017).

The important difference between “critical and declining” and the rest of the plans centers instead on the percentage of inactive members and the impact of that ratio on cash flow (see Figure 20). In terms of inactives, plans in all zones have seen their percentages increase since the turn of the century, but plans that have identified as “critical and declining” have had a significantly higher percentage of inactives to total members throughout the period.

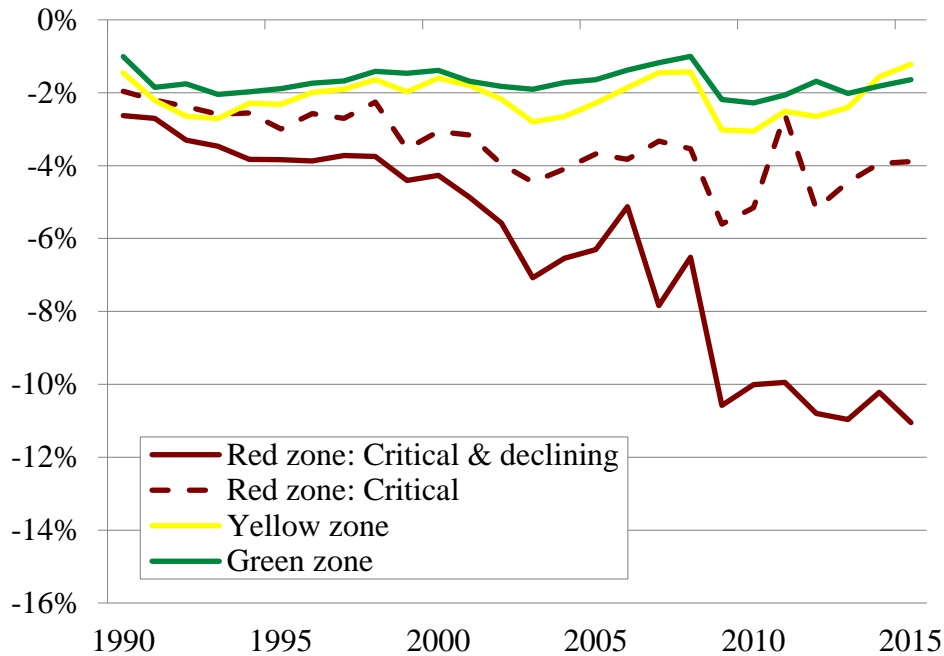
Figure 20. *Inactive Members as a Percentage of Total Members by 2016 Risk Status, 1990-2015*



Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (1990-2015); and U.S. Department of Labor (2017).

The cash flow chart is even more dramatic (see Figure 21). Reflecting the higher percentage of inactives, the plans ultimately classified as “critical and declining” had a somewhat higher rate of negative cash flow than those in other zones until the financial crises. With the bursting of the dot-com bubble at the turn of the century, however, the trajectory of the “critical and declining” plans diverged sharply from plans in other zones. Then as the market recovered, they headed back to roughly where they would have been absent this century’s first financial crisis. With the financial collapse in 2008, however, these plans were thrown dramatically and irreparably off course and have leveled out with a negative cash flow of about -11 percent, a drain – even with expected returns between 7 and 8 percent – from which it is extremely difficult to recover.

Figure 21. *Cash Flow by 2016 Risk Status, 1990-2015*

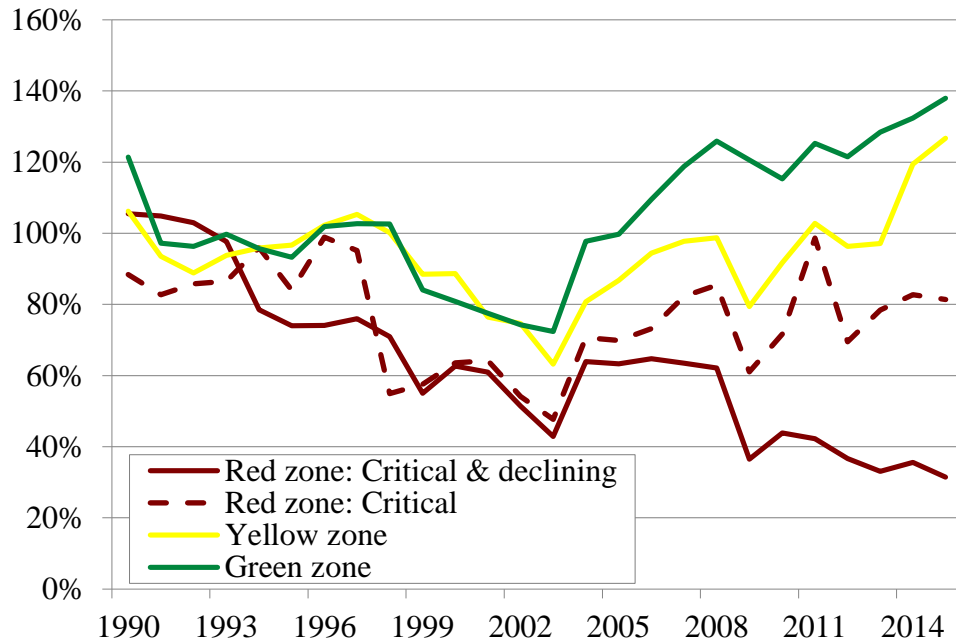


Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (1990-2015); and U.S. Department of Labor (2017).

The high rate of negative cash flow is reflected in the percentage of the annual required contribution (ARC) paid (see Figure 22).⁴⁸ The numbers shown are based on an ARC that combines the normal cost with a 15-year level-dollar amortization payment. While plans in all zones reduced their percentage of ARC paid during the stock market boom of the 1990s, most improved their percentage of ARC paid in the wake of the loss of assets due to the bursting of the dot-com bubble and the financial crisis. Plans that ultimately ended up as “critical and declining,” however, continued to pay a smaller and smaller share of the ARC, and that share declined sharply in the wake of the financial crisis.

⁴⁸ In the private sector, the minimum required contribution – not the ARC – is the preferred metric for assessing the contribution adequacy. However, because the minimum contribution includes credits and charges based on historical over and underpayment of contributions, it can diverge greatly from the actual contributions needed based on the funded status in a given year. Recent work by the SOA (2017) employed an ARC concept to assess the adequacy of multiemployer pension contributions and this report uses the same definition of the ARC: the normal cost plus an amount to amortize the unfunded liability over 15 years in level dollar payments.

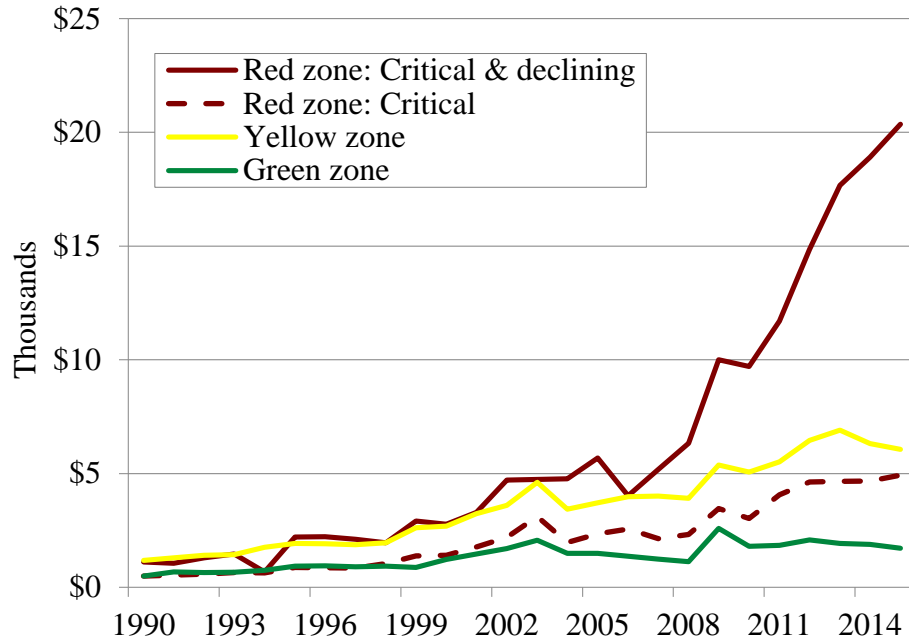
Figure 22. *Percentage of Annual Required Contribution Paid by 2016 Risk Status, 1995-2015*



Note: Estimates assume a 15-year amortization using level-dollar payments of unfunded liabilities at market value. Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (1990-2015); and U.S. Department of Labor (2017).

One reason that plans that ended up “critical and declining” started to pay a smaller and smaller percentages of their ARCs appears to be that they suffered not only a precipitous decline in assets – like all other plans – in the financial crisis but that they also saw a sharp decline in the number of active workers. This combination made the per-worker amortization payment unaffordable (see Figure 23).

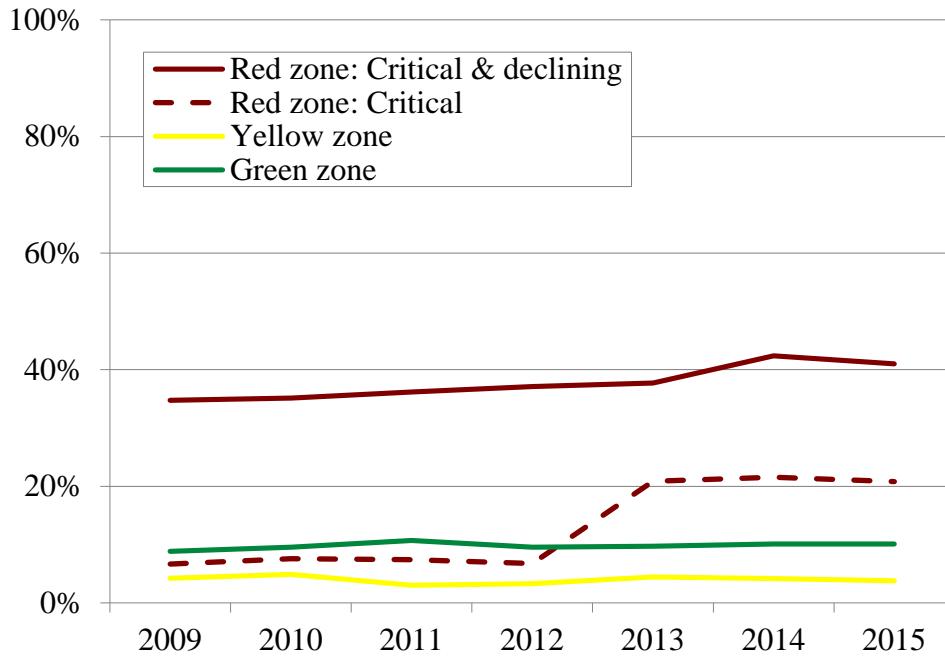
Figure 23. Average Amortization Payment per Active Member by 2016 Risk Status, 1990-2015, Thousands



Note: Estimates assume a 15-year amortization using level-dollar payments of unfunded liabilities at market value. Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (1990-2015); and U.S. Department of Labor (2017).

Figure 24 shows orphans as a percentage of total members by 2016 zone status (data are available only since 2009). The differences are significant, with “critical and declining” plans having at least twice the share of orphans as plans in other zones. The relationship among the various zones, however, remains roughly unchanged over the five-year period.

Figure 24. *Orphans as a Percentage of Total Members by 2016 Risk Status, 2009-2015*



Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2009-2015); and U.S. Department of Labor (2017).

Regression Analysis. To further explore the relationship between the key variables and the probability in 2015 – the last year for which full information is available – of being classified as “critical and declining,” the next step is to estimate a regression relating the plans’ 2016 status to the variables discussed above. Average values for these variables are shown in Table 15.

Table 15. *2015 Average Plan Characteristics by 2016 Risk Status*

Plan characteristics	Red		Yellow	Green	All
	Critical & declining	Critical			
Percent inactive	83.8%	65.2%	59.0%	56.0%	61.5%
Cash flow	-11.0	-3.9	-1.2	-1.6	-2.7
Percent ARC paid	31.4	81.4	126.7	138.0	104.7
Funded ratio	35.3	38.7	41.4	53.3	46.4
Percent orphans	41.0	20.8	3.8	10.1	15.0

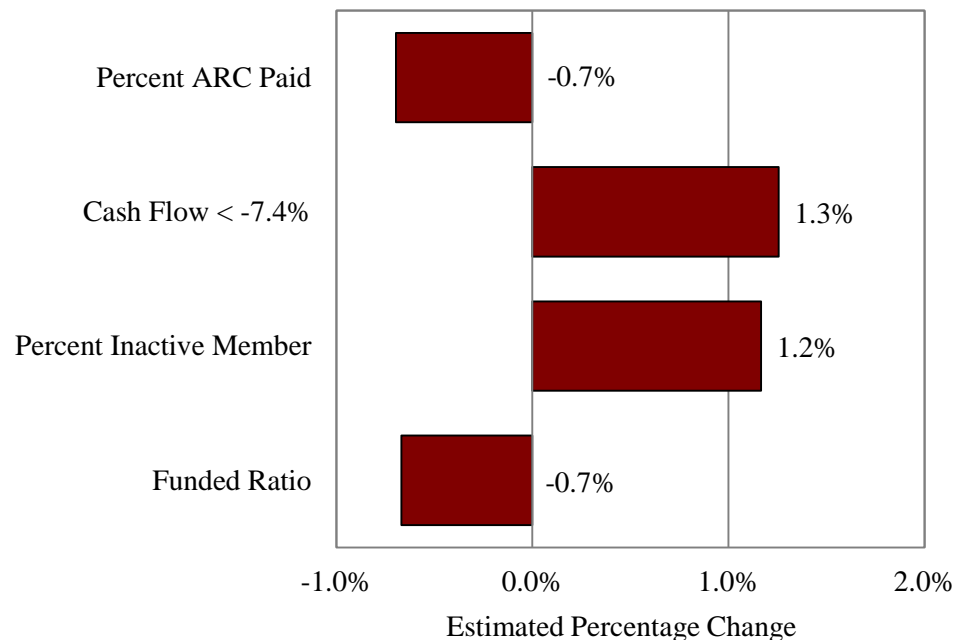
Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2010); and U.S. Department of Labor (2017).

Because of the close correlation between the percentage of inactives and cash flows, the cash flow term is entered as a binary variable set equal to 1 if the negative cash flow rate exceeds

-7.4 percent (the average assumed return for multiemployer plans in 2015) and zero otherwise. The orphan variable is excluded because it is so closely correlated with the inactive variable.

The results of the regression are shown in Figure 25. Full results are presented in Appendix Table A2. The results represent a change from zero to 1 for dichotomous variables and the impact of a one-standard-deviation change for the continuous variables. All the variables have the predictable relationship with being “critical and declining,” and the coefficients are all statistically significant. Given that only 8 percent of plans fall in the “critical and declining” category, the magnitudes of the coefficients are meaningful.

Figure 25. *Estimated Relationship of Variables with Probability of Being in “Critical and Declining” Status, 2015*



Note: Cash flow is statistically significant at the 10-percent level, percent ARC paid and funded ratio are statistically significant at the 5-percent level, and percent inactive members is statistically significant at the 1-percent level. Values represent the impact of a one-standard-deviation change in each variable.
 Sources: Authors’ calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

Identifying Possible Future “Critical and Declining” Plans

The correlates shown in the previous analysis can be used to identify plans with problems comparable to those plans currently in “critical and declining” status. The following discussion uses three approaches. The first approach screens all multiemployer plans to identify those with high rates of negative cash flow. The second uses the CRR’s cash flow model to

identify any other plans with a high likelihood of insolvency within the next 20 years. The third looks at the characteristics of the 20 largest plans.

Plans with High Negative Cash Flows. Table 16 presents plans that have more than 1,000 members that were identified as having negative cash flow of -10 percent or more. These plans represent 15 of the 32 plans identified; the full listing including smaller plans can be found in Appendix Table A3. The full list of 32 plans includes 103,000 members and represents approximately \$5.5 billion of the current unfunded liability. Of course, a lower threshold – say, 7.4 percent – would yield a longer list.

Table 16. *Plans with More than 1,000 Members with Negative Cash Flow of -10 Percent or More, 2015*

Plan status Plan name	Cash flow	Funded ratio		Total members	Exhaustion date
		Current	Actuarial		
Red zone: Critical					
Textile/Health Care/Technical Employees Local 1	-54.6%	6.9%	6.9%	1,125	2017
Local 584 Pension Trust Fund	-18.9	24.0	32.1	2,365	2021
Graphic Communications Local 96-B	-17.7	31.1	39.3	35,881	2022
Americas Family Defined Benefit Plan	-16.1	26.2	44.6	3,622	2023
Gastronomical Workers Local 610	-15.2	40.5	42.0	2,877	2026
Local 305 CIO Pension Fund	-12.6	29.3	39.3	1,272	2025
Local 807 Labor Management	-12.4	32.9	49.6	4,649	2025
Local 917	-11.4	42.3	71.1	1,899	2029
WHSE Local 169 Employees/Employers	-11.3	31.4	65.6	4,626	N/A
Local 210	-11.3	28.3	52.2	4,365	2029
Western Pennsylvania Teamsters	-10.7	27.6	47.5	23,195	2030
Yellow zone					
National Basketball Association	-12.1	33.5	57.9	1,723	N/A
Teamster Affiliates Pension Plan	-11.2	63.3	92.5	6,363	N/A
Green zone					
Pension Plan of Mid-Jersey Trucking	-10.3	51.1	77.5	2,067	2028
ILA PRSSA Pension Fund	-10.0	56.9	83.2	1,153	2028

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

Not surprisingly, the bulk of vulnerable plans fall within the red zone, and most of these have less than 5,000 participants. Two plans, however, have more than 20,000 members: Graphic Communications Teamsters and Western Pennsylvania Teamsters. These large plans

not only have high rates of negative cash flow but also are seriously underfunded; it is hard to see how they can avoid insolvency in the next 20 years.

For the most part, on an actuarial basis, the plans in the yellow and green zones with high rates of negative cash flow tend to be better funded than plans in the red zone, but they may merit a little scrutiny. This exercise is not presented as definitive but only to point out that looking at correlates of “critical and declining” plans suggests that other plans – particularly those in the red zone – could soon become “critical and declining.”

Results from a Simple Cash Flow Model. The CRR’s simple cash flow model projects the number of years before each plan exhausts its assets. This model, based on data from the Form 5500, assumes no increase in contributions and estimates that benefits grow at about 2 percent to 3 percent, depending on the specifics of the plan.⁴⁹ About 550 plans provide benefit projections at least for 10 years forward. For plans that do not provide their own benefit projections, the analysis uses projections provided by plans with similar characteristics. Assets are projected to grow at the plan’s assumed rate of return, a generous assumption. The overall results for this exercise confirm the expected pattern by zone, but also suggest that the model is somewhat optimistic in terms of insolvency dates since it shows only 80 percent of “critical and declining” plans become insolvent within the 20-year window (see Table 17).

Table 17. Estimated Distribution of Multiemployer Plan Exhaustion Dates by Risk Status, 2015

Risk status	Estimated years until exhaustion			
	0-10	11-20	21-30	Never
Red zone: Critical and declining	34.3%	47.1%	5.9%	12.8%
Red zone: Critical	6.0	12.0	14.4	67.6
Yellow zone	0.5	2.0	9.9	87.6
Green zone	0.4	1.1	4.9	93.6

Source: Authors’ calculations from U.S. Department of Labor, *Form 5500* (2015).

Despite this sanguine bias, the cash flow model picks up a number of plans – in addition to those already identified above through the -10 percent cash flow filter – that are projected to

⁴⁹ Some data corrections are made on the contribution side, such as removing withdrawal liability contributions and using only regular employer contributions for the projections. The simple projection method does not take into account any benefit cuts or scheduled contribution increases under rehabilitation plans.

become insolvent within 20 years. Table 18 presents the results for plans with more than 1,000 members that are projected to become insolvent within 20 years, despite cash flows of greater than -10 percent of assets. These plans represent 14 of the 30 plans identified; the full listing including smaller plans can be found in Appendix Table A4. The full list of 30 plans includes just under 200,000 members and represents \$19.6 billion of the current unfunded liability.

Table 18. *Additional Plans with More than 1,000 Members Projected to Become Insolvent within 20 Years, 2015*

Plan status Plan name	Cash flow	Funded ratio		Total members	Exhaustion date
		Current	Actuarial		
Red zone: Critical					
New England Teamsters & Trucking	-9.8%	20.8%	39.5%	72,390	2027
Bakery Drivers Local 802	-9.7	31.7	47.8	1,691	2031
UFCW Tri-State Food Industry Employers	-9.4	30.8	57.1	33,176	2031
Warehousemen's Distributors Association	-9.3	40.5	63.0	4,586	2030
Local 445	-8.8	50.9	81.5	3,409	2031
Ohio Carpenters' Pension	-7.5	36.2	69.9	28,063	2033
UFCW Local 1	-7.5	28.1	50.2	23,171	2029
Local 1158 IBEW - PA	-6.8	40.2	63.7	1,379	2035
Hagerstown Motor Carriers & Teamsters	-6.6	42.8	64.1	1,735	2035
Alaska Teamsters	-6.5	40.6	61.3	9,352	2033
Yellow zone					
Plumbers/Steamfitters Local 150	-8.2	47.6	80.5	1,469	2031
Green zone					
Southwest Regional Council of Carpenters	-9.9	68.4	95.4	3,377	2028
Pressroom Unions Fund	-9.7	63.3	100.4	1,872	2033
UFCW International Union Plan	-8.1	59.3	90.6	7,630	2033

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

The plans projected to become insolvent in the next 20 years generally have negative cash flow rates in excess of -6 percent, and most fall in the red zone where high rates of negative cash flow are matched by significant underfunding. Approximately one-fifth of these red zone plans are quite large, having 23,000 to 72,000 participants.

Three plans in the green zone have rates of negative cash flow of 8 percent or more. But they relatively well funded on an actuarial basis, so if they achieve their assumed rate of return they should be able to honor their benefit commitments.

The 20 Largest Plans. To ensure that the simple screening methods applied above are not missing the next Central-States-Teamsters problem, Table 19 lists the 20 largest multiemployer plans, their zone status, and key correlates of trouble: funded ratio, inactives as a percentage of total members, cash flow rate, and orphans as a percentage of total members.

Table 19. *Overview of Largest 20 Multiemployer Plans by Total Members, 2015*

Plan name	Plan status	Funded ratio	Percent inactive	Cash flow	Orphans / total members	Total members
Western Conference of Teamsters	Green	57.6%	65.6 %	-2.6%	21.2%	591,619
National Electrical Benefit Fund	Green	46.0	52.3	-3.8	16.5	555,981
National Retirement Fund Plan	Red: Critical	37.4	79.5	-5.3	76.5	407,404
Central States, Southeast & Southwest	Red: Critical & declining	33.0	83.8	-12.5	52.6	397,492
IAM National Pension Fund	Green	55.2	62.4	-2.2	38.8	283,622
UFCW Consolidated Pension Fund	Green	52.9	48.5	-0.4	17.0	259,962
1199 Health Care Employees Fund	Green	47.0	54.7	-1.7	4.4	257,296
Central Pension Fund of The IUOE	Green	49.1	53.6	-1.1	0.4	233,857
United Food & Commercial Workers Industry	Green	59.6	58.6	-3.6	4.3	227,748
S. California UFCW/Food Employers	Red: Critical	41.0	67.4	-4.7	0.0	177,585
Plumbers & Pipefitters National Fund	Yellow	40.1	49.6	-3.3	0.0	158,408
Sound Retirement Trust	Red: Critical	46.2	38.4	-4.0	2.1	144,407
Sheet Metal Workers' National Fund	Yellow	34.1	59.2	-0.1	0.0	136,848
UFCW N. California Employers Joint Pension	Red: Critical	36.4	61.0	-5.5	0.0	130,955
Steelworkers Pension Trust	Green	49.8	51.9	0.0	27.6	114,920
S.E.I.U. National Industry Pension Fund	Red: Critical	45.9	55.4	-1.7	0.3	113,080
Bakery & Confectionery Pension Fund	Red: Critical & declining	42.6	79.9	-8.8	33.9	113,040
United Mine Workers of America 1974 Plan	Red: Critical & declining	39.8	92.1	-14.9	43.7	104,258
Building Service 32BJ Pension Fund	Red: Critical	33.5	47.9	0.5	0.1	103,983
Southern Nevada Culinary/Bartenders Plan	Green	55.9	44.8	-1.3	0.0	100,430

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

The really troublesome plans on this list – the Central States Teamsters, Bakery & Confectionary Union, and the United Mine Workers – have already been designated as “critical and declining.” The “critical” plan that looks the most problematic is the Pension Plan of the National Retirement Fund, where orphans account for more than 75 percent of total members. That ratio seems like it would place a very heavy burden on current workers and employers.

In summary, a historical look at the characteristics of plans that end up as “critical and declining” confirms that the factors identified earlier – a declining number of participants, a low

funded ratio, a high percentage of inactives to total members, and a high rate of negative cash flow – make it impossible for some plans to pay their ARCs in the wake of a financial crisis that decimates assets. These factors can also be used to identify potential problems going forward. A -10 percent cash flow filter shows a number of other red zone plans in a precarious situation. Applying the CRR’s simple cash flow model produces several more plans that merit attention. Finally, among the nation’s largest 20 plans, three have already been classified as “critical and declining” and another four are “critical”. These results suggest that it is important to look beyond the most acute cases when considering solutions.

Conclusion

Multiemployer plans are a significant component of the employer-sponsored retirement system, and they, like other employer plans, have been challenged by the twin financial crises since 2000. While the majority of multiemployer plans are returning to financial health, a substantial minority face serious funding problems that are exacerbated by unique structural challenges facing the multiemployer sector. These challenges include high ratios of inactive to total participants, high rates of negative cash flows, and withdrawal penalties for exiting companies that are insufficient to cover the costs they leave behind.

Multiemployer plans that are in difficult financial shape are eligible for help from the PBGC. However, the PBGC’s guarantees for multiemployer plans are very low compared to single-employer plans. Moreover, estimates of the PBGC’s potential loss exposure from troubled multiemployer plans have soared in recent years. And the PBGC’s multiemployer program is more likely than not to be insolvent in 10 years, which means that benefits paid to participants – already modest – could be reduced dramatically.

The hole for “critical and declining” plans is \$76 billion, based on the current view of funding that uses the market value of assets and values liabilities using a four-year average yield on 30-year Treasuries for the discount rate. Of this amount, about \$45 billion is for plans that have already applied to the Treasury requesting the ability to cut accrued benefits for plan participants. For all plans in the red zone, both “critical” and “critical and declining,” the hole is \$187 billion. And, for all multiemployer plans, the hole is \$553 billion. Most multiemployer plans have taken remedial action and have put themselves on a sustainable path. However, the “critical and declining” plans face large negative cash flows and a potential death spiral.

The Multiemployer Pension Reform Act (MPRA) represented a last-ditch effort to save a small but significant number of multiemployer plans from insolvency. It was based on the understanding that the federal government was not going to rescue the plans directly or provide the PBGC with the funds to partition out orphaned workers or help in other ways. Based on those assumptions, MPRA tried to balance competing interests: maintaining the support of active workers; keeping employers from exiting the plans (and attracting new employers); and ensuring that benefits exceed what participants would get under insolvency.

MPRA has not turned out to be the cure-all that was hoped. The Treasury has rejected the applications of the Central States Teamsters and four other plans; it has approved the applications by the International Association of Machinists Motor City, the Iron Workers Local 17, the New York State Teamsters, and the United Furniture Workers. One other application is currently under review and five have been withdrawn. It does not look like plans in “critical and declining” status can rely on benefit cuts alone as a solution.

At this stage, the majority of proposed solutions for the “critical and declining” plans focus on alleviating the burden of orphans and/or providing low-rate or government loans. Either approach costs money, and a case can be made for an approach that involves contributions from employers that are tailored not to sink already fragile plans and from plan participants and taxpayers.

If a concerted effort is to be made to solve the multiemployer crisis, it is important to understand how plans got into this desperate plight. Early action might be able to stabilize other plans in the red zone heading for trouble. Indeed, a significant number have negative cash flow rates in excess of -10 percent. Any strategy designed to solve the multiemployer problem must be comprehensive and forward-looking – helping not only those in serious trouble today but also staving off future problems.

References

- American Academy of Actuaries. 2016. "Honoring the PBGC Guarantee for Multiemployer Plans Requires Difficult Choices." Washington, DC.
- Bickley, James M. 2012. *Budgetary Treatment of Federal Credit (Direct Loans and Loan Guarantees): Concepts, History, and Issues for the 112th Congress*. Congressional Research Service. Washington, DC.
- Chen, Ting, Xiumin Martin, Christina A. Mashruwala, Shamin D. Mashruwala. 2015. "The Value and Credit Relevance of Multiemployer Pension Plan Obligations." *The Accounting Review* 90(5): 1907–1938.
- Davis, Harry. 1974. "Multiemployer Pension Plan Provisions in 1973." *Monthly Labor Review* 1974: 10-16.
- Defrehn, Randy G. and Joshua Shapiro. 2013. "Solutions not Bailouts: A Comprehensive Plan from Business and Labor to Safeguard Multiemployer Retirement Security, Protect Taxpayers and Spur Economic Growth." Washington, DC: National Coordinating Committee for Multiemployer Plans.
- Even, William E. and David A. Macpherson. 2014. "What Do Unions Do to Pension Performance?" *Economic Inquiry* 52(3): 1173–1189.
- Hirsch, Barry T. and David A. Macpherson. 2016. "1980-2015 Union Membership and Coverage Database." Available at: <http://www.unionstats.com>
- Huling, Ronald. 1979. "Study of Multiemployer Plans." Washington, DC: Towers, Perrin, Forster, & Crosby, Inc.
- Mazo, Judith F. and Eli Greenblum. 2012. "Multiemployer Pension Plans Respond to the Financial Crisis." Working Paper WP2011-15. Philadelphia, PA: Pension Research Council.
- McMurdy, Keith R. 2009. "Multiemployer Withdrawal Liability: Understanding the Basics." Philadelphia, PA: Fox Rothschild LLP.
- Milliman Inc. 2016. "Multiemployer Pension Funding Study." New York, NY.
- Mitchell, Olivia and Emily Andrews. 1981. "Scale Economies in Private Multi-Employer Pension Systems." *Industrial and Labor Relations Review* 34(4): 522-530.
- Moody's Investors Service. 2014-2016. "Global Credit Research, Rating Actions." Available at: <https://www.moodys.com/>

- Munnell, Alicia H. and Jean-Pierre Aubry. 2014a. “Private Sector Multiemployer Pension Plans – A Primer.” *Issue in Brief* 14-13. Chestnut Hill, MA: Center for Retirement Research at Boston College.
- Munnell, Alicia H. and Jean-Pierre Aubry. 2014b. “The Financial Status of Private Sector Multiemployer Pension Plans.” *Issue in Brief* 14-14. Chestnut Hill, MA: Center for Retirement Research at Boston College.
- Munnell, Alicia H. and Jean-Pierre Aubry. 2014c. “Can PBGC Save Multiemployer Plans?” *Issue in Brief* 14-16. Chestnut Hill, MA: Center for Retirement Research at Boston College.
- Munnell, Alicia H., Jean-Pierre Aubry, Wenliang Hou, and Anthony Webb. 2014d. “Multiemployer Plans – A Proposal to Spread the Pain.” *Issue in Brief* 14-17. Chestnut Hill, MA: Center for Retirement Research at Boston College.
- National Bureau of Economic Research. 2016. “U.S. Business Cycle Expansions and Contractions.” Cambridge, MA. Available at: <http://www.nber.org/cycles.html>
- Pension Benefit Guaranty Corporation. 2013. *Multiemployer Pension Plans: Report to Congress Required by the Pension Protection Act of 2006*. Washington, DC.
- Pension Benefit Guaranty Corporation. 2014. *2014 Pension Insurance Data Tables*. Washington, DC.
- Pension Benefit Guaranty Corporation. 2015. *PBGC’s Multiemployer Guarantee*. Washington, DC. Available at: <http://www.pbgc.gov/documents/2015-ME-Guarantee-Study-Final.pdf>
- Pension Benefit Guaranty Corporation. 2016a. “FY 2015 Projections Report.” Washington, DC.
- Pension Benefit Guaranty Corporation. 2016b. *PBGC Insurance of Multiemployer Pension Plans: A Five Year Report*. Washington, DC.
- Pension Benefit Guaranty Corporation. 2017a. *PBGC Guarantee Limit for Single-Employer Plans Increases for 2017*. Available at: <https://www.pbgc.gov/news/press/releases/pr16-16.html>
- Pension Benefit Guaranty Corporation. 2000-2016. *PBGC Annual Report*. Washington, DC.
- Pension Benefit Guaranty Corporation. 2017b. “Premium Rates.” Available at: <https://www.pbgc.gov/prac/prem/premium-rates>
- Segal Consulting. 2014a. “Survey of Plans’ 2014 Zone Status.” *Benefits, Compensation, and HR Consulting* (Winter 2014). New York, NY.

- Segal Consulting. 2014b. "Survey of Calendar-Year Plans' 2014 Zone Status." *Benefits, Compensation, and HR Consulting* (Spring 2014). New York, NY.
- Segal Consulting. 2014c. "Shades of Green: Key Questions to Ask about Being in the Green Zone." *Benefits, Compensation, and HR Consulting* (October 2014). New York, NY.
- Segal Consulting. 2015. "Survey of Plans' Zone Status." *Data: Practical Research for Multiemployer Plans*. (Spring 2015). New York, NY.
- Segal Consulting. 2016. "Multiemployer Plans are Predominantly Green: Survey of Plans' Zone Status." *Data: Practical Research for Multiemployer Plans*. (Spring 2016). New York, NY.
- Solis, Hilda L., Timothy F. Geithner, and Joshua Gotbaum. 2013. "Multiemployer Pension Plans: Report to Congress Required by the Pension Protection Act of 2006." Washington, DC.
- Society of Actuaries. March 2016. "Multiemployer Pension Plan Contribution Analysis." Washington, DC.
- Society of Actuaries. January 2017. "U.S. Multiemployer Pension Plan Contribution Indices." Washington, DC.
- UPS, ABF Freight System, Inc., Jack Cooper Transport Company, Inc., and YRC Inc. 10-K Annual Report, SEC EDGAR, 2016. Available at: <http://www.sec.gov/edgar.shtml>.
- U.S. Bureau of Labor Statistics. *Current Employment Statistics*, 1980-2016. Washington, DC.
- U.S. Census Bureau. 2014. *Survey of Public Pensions: State- and Locally-Administered Defined Benefit Data*. Washington, DC.
- U.S. Department of Labor, Employee Benefits Security Administration. 2016a. *Private Pension Plan Bulletin, Abstract of 2014 Form 5500 Annual Reports*. Washington, DC.
- U.S. Department of Labor, Employee Benefits Security Administration. 2016b. *Private Pension Plan Bulletin Historical Tables and Graphs, 1975-2014*. Washington, DC.
- U.S. Department of Labor. 2017. *Critical, Critical and Declining, Endangered and WRERA Status Notices*. Washington, DC. Available at: <https://www.dol.gov/agencies/ebsa/about-ebsa/our-activities/public-disclosure/critical-status-notices>
- U.S. Department of Labor, Employee Benefits Security Administration. *Form 5500 Series*, 1990-2015. Washington, DC.
- U.S. Department of Treasury. 2016-2017. *Applications for Benefit Suspension*. Washington, DC. Available at: <https://www.treasury.gov/services/Pages/Plan-Applications.aspx>

- U. S. General Accounting Office. 1982. *Multiemployer Pension Plan Data Are Inaccurate and Incomplete*. Report No. GAO/HRD-83-7. Washington, DC.
- U. S. General Accounting Office. 1984a. *Assessment of Special Rules Exempting Employers Withdrawing From Multiemployer Pension Plans From Withdrawal Liability*. Report No. GAO/HRD-84-1. Washington, DC.
- U. S. General Accounting Office. 1984b. *Incomplete Participant Data Affect Reliability of Values Placed by Actuaries on Multiemployer Pension Plans*. Report No. GAO/HRD-84-38. Washington, DC.
- U. S. General Accounting Office. 1985a. *The 1980 Multiemployer Pension Plan Amendments Act: An Assessment of Funding Requirement Changes*. Report No. GAO/HRD-85-1. Washington, DC.
- U. S. General Accounting Office. 1985b. *Effects of Liabilities Assessed Employers Withdrawing From Multiemployer Pension Plans*. Report No. GAO/HRD-85-16. Washington, DC.
- U. S. General Accounting Office. 1985c. *Effects of The 1980 Multiemployer Pension Plan Amendments Act on Plan Participants' Benefits*. Report No. GAO/HRD-85-58. Washington, DC.
- U. S. General Accounting Office. 1985d. *Financial Conditions of Multiemployer Pension Plans Generally Improved from 1978 To 1980*. Report No. GAO/HRD-85-72. Washington, DC.
- U. S. General Accounting Office. 1986. *1980 Multiemployer Pension Amendments: Overview of Effects and Issues*. Report No. GAO/HRD-86-4. Washington, DC.
- U. S. Government Accountability Office. 2004a. *Private Pensions: Multiemployer Pensions Face Key Challenges to Their Long-Term Prospects*. Report No. GAO-04-542T. Washington, DC.
- U. S. Government Accountability Office. 2004b. *Private Pensions: Multiemployer Plans Face Short- and Long-Term Challenges*. Report No. GAO-04-423. Washington, DC.
- U. S. Government Accountability Office. 2010. *Private Pensions: Changes Needed to Better Protect Multiemployer Pension Benefits*. Report No. GAO-11-79. Washington, DC.
- U. S. Government Accountability Office. 2013a. *Multiemployer Plans and PBGC Face Urgent Challenges*. Report No. GAO-13-428T. Washington, DC.
- U. S. Government Accountability Office. 2013b. *Private Pensions: Timely Action Needed to Address Impending Multiemployer Plan Insolvencies*. Report No. GAO-13-240. Washington, DC.

Appendix

Table A1. *Key Factors Reported in MPRA Application for the Decline of Plans*

Plan Name	Description of Factors
Alaska Ironworkers	Poor market performance in 2000 and 2008, paired with a recent downturn in the local economy and ironworking in Alaska, contributed to the plan's critical status. Specifically, the State of Alaska has entered a recession due to a dramatic decline in the price of oil, resulting in a loss of 1,500 private sector jobs between 2014 and 2016. In addition, due to the plan's rapid maturation, employee contributions became insufficient, as the assumed number of contributory hours decreased from 290,000 hours per year in 2009 to 184,000 in 2016. The magnitude of the employer contributions needed to revive the plan were projected to result in the withdrawal or bankruptcy of most participating employers. Further, these steep employer contribution rates made it difficult to attract new employers to the plan.
Automotive Industries	Decline in automotive industry businesses in the San Francisco Bay Area as a result of the decline over the last 10 years in the U.S. automotive industry and economic recessions over the last 15 years. Plan employers engaged in a fragmented, competitive industry and have higher labor costs. Only 4 of the 149 original employers still exist. In 2000, 16 Ford and 10 Chrysler dealerships contributed to the plans. As of 2015, only 3 of those 26 dealerships remain in the plan.
Bricklayers Local 5 New York	Poor investment returns in 2008 forced the plan into critical status. Poor investment returns in 2011 and continued decline in contribution hours forced the plan to take steps to avoid insolvency. Plan provides generous benefits compared to non-plan bricklayers. Little to no growth in the local construction market.
Bricklayers Local 7	Plan provides generous benefits compared to non-union bricklayers. Experiencing increased member attrition to nearby unions that maintain plans that are better funded. Decline in hours worked and number of employers in the area. Decline in number of union members in the area.
Central States Teamsters	Deregulation of trucking in the 1980s and the economic and financial crises since 2001 forced many major trucking companies out of business. Of the 50 largest contributing employers that participated in 1980, almost all are out of business and only 3 contribute today.[2]
Intl. Assoc. of Machinists Motor City	Between 2006 and 2016, the number of active employees decreased by over 60 percent, from 392 to 141 active members. The major shocks to the plan include the successive withdrawal of major employers beginning in 2007, a portion of whose withdrawal liability was deemed uncollectable. Since 2008, the plan has shrunk from 19 to 5 participating employers. The remaining employers threatened withdrawal if contribution rates were raised any further.
Ironworkers Local 17	Decline in active work population. Asset losses in 2002, 2008, and 2009.
Ironworkers Local 16	Economic decline of Baltimore, MD. Loss of qualified workers due to declining working opportunities, stagnant wages. Dramatic drop in employers from 125 to 60 over the past six years, including the loss of some original participating employers in the plan. Bankruptcy of Sparrows Point, in Baltimore County, MD, which housed steel mills and related facilities and generated between 13 percent and 22 percent of work hours for members of the plan.
Local 805	The number of contributing employers steadily declined due to the stagnation of the local trucking market and the emergence of online retailers. Additionally, significant taxes imposed on tobacco, candy, and other related products limited the employers' ability to pass on some of the increased costs to customers. The plan ceased any further increases to employer contributions to prevent more contributing employers from leaving the plan, due to either business failure or withdrawal.

New York State Teamsters	Deregulation of trucking in the 1980s and the economic and financial crises since 2001 forced many trucking companies out of business. Decline in LTL sector of trucking industry, especially those in the smaller freight businesses in New York State and its unionized workforce have suffered a rapid decline. More acutely, the plan lost several major employers from 2009 to 2015.[1]
Road Carriers Local 707	Financial decline of largest employer – YRC – that resulted in a negotiated 75-percent reduction in pension contributions to stave off employer bankruptcy. Deregulation of trucking in the 1980s and the economic and financial crises since 2001 forced many LTL trucking companies out of business. Specifically, decline in LTL sector of trucking industry in the New York region and its unionized workforce have suffered a more rapid decline.
Southwest Ohio Regional Council of Carpenters	Since 2000 the plan's cash flow has consistently declined. In 2008, the plan suffered a negative 26 percent return on assets, from which the plan has never recovered. Despite steadily increasing the hourly contribution rate, the plan's funded status did not improve. Throughout this period, the number of participating employers decreased from 256 to 182.
Teamsters Local 469	Deregulation of trucking in the 1980s and the economic and financial crises since 2001 forced thousands of trucking, concrete, material deliveries, and other industries out of business. Specifically, these industries within the New Jersey region and its unionized workforce have suffered a rapid decline.
United Furniture Workers	The rapid increase in U.S. furniture imports since the 1970s put increasing pressure on U.S. furniture manufacturers and, thus, the pension plan. From 1981 to 2009, 35 contributing employers filed for bankruptcy. Since 2008, 29 of the 53 contributing employers have withdrawn from the plan and active participants have dropped from about 2,500 to 1,000.
Western States Office & Professional Employees	The 2002 bankruptcy of a significant contributing employer (Consolidated Freightways) resulted in a substantial decrease in employer contributions. In 2005, the plan added a new significant employer (Northwest Natural Gas) at a low contribution rate, with the intention of gradually increasing the rate over time. Yet the employer's contribution rate was never increased, in part due to the 2008 financial crisis, and the employer withdrew from the plan in 2013. Additionally, a significant portion of the plan's participants are office staff working for local unions, a sector that is consistently declining.
<i>Sources:</i> Authors' calculations from U.S. Department of Labor, <i>Form 5500</i> (2015); and the U.S. Department of the Treasury, "Applications for Benefit Suspension" (2017).	

Table A2. *Estimated Effect on the Probability of “Critical and Declining” Status, 2015*

	Coefficients	Standard deviation	Effect of one-standard-deviation change
Percentage ARC paid	-0.01** (0.00)	0.79	-0.007
Cash flow < -7.4%	0.04* (0.03)	0.30	0.013
Percent inactive members	0.08*** (0.03)	0.15	0.012
Funded ratio	-0.05** (0.02)	0.14	-0.007
Sample size	1,222		
R-squared	0.59		

Note: Statistically significant at 10-percent (*), 5-percent (**), or 1-percent level (***).

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

Table A3. *Plans with Negative Cash Flow of -10 Percent or More, 2015*

Plan status Plan name	Cash flow	Funded ratio		Total members	Exhaustion date
		Current	Actuarial		
Red zone: Critical					
Textile/Health Care/Technical Employees Local 1	-54.6%	6.9%	6.9%	1,125	2017
Cement Masons Local 681	-36.5	18.5	14.8	343	2018
Insulators Local 112	-34.0	13.9	14.0	305	2019
International Union of Tool, Die & Mold Makers	-21.7	29.3	31.9	169	2021
Local 584 Pension Trust Fund	-18.9	24.0	32.1	2,365	2021
Graphic Communications Local 96-B	-17.7	31.1	39.3	35,881	2022
Local 466 Painters/Decorators/Paperhangers	-16.5	30.4	43.1	51	2022
Americas Family Defined Benefit Plan	-16.1	26.2	44.6	3,622	2023
Gastronomical Workers Local 610	-15.2	40.5	42.0	2,877	2026
Hawaii Shopmen's Local 803	-13.5	44.5	55.8	178	2026
Paper Handlers/Publishers' Pension Fund	-13.2	48.2	74.7	289	2025
Local 305 CIO Pension Fund	-12.6	29.3	39.3	1,272	2025
Local 807 Labor Management	-12.4	32.9	49.6	4,649	2025
Employee Pension Plan LO. 640 IATSE	-12.3	32.6	54.3	160	2027
Local 18 Police/Protection ISOPG	-11.7	59.5	61.6	875	N/A
Local 917	-11.4	42.3	71.1	1,899	2029
Cement Masons Local 567	-11.4	44.6	63.0	162	2027
WHSE Local 169 Employees/Employers	-11.3	31.4	65.6	4,626	N/A
Local 210	-11.3	28.3	52.2	4,365	2029
Laborers International of N.A. Local 1000	-11.0	22.5	44.5	490	2025
ABGW AFL- CIO, CLC Eastern District 12	-11.0	26.0	43.7	569	2026
New Mexico Plasterers/Cement Masons	-10.9	59.0	89.4	332	2029
Western Pennsylvania Teamsters	-10.7	27.6	47.5	23,195	2030
Yellow zone					
Grand Rapids Bindery/Pressmen	-18.9	51.9	75.9	33	2026
Sheet Metal Workers Local 7 Zone 1	-14.6	32.6	56.0	742	2022
National Basketball Association	-12.1	33.5	57.9	1,723	N/A
Teamster Affiliates Pension Plan	-11.2	63.3	92.5	6,363	N/A
Green zone					
United Automotive Association	-99.1	200.7	224.5	225	2017
Local 177	-40.4	57.6	85.5	268	2018
MFOW Supplementary Plan	-14.6	72.0	86.0	237	2024
Pension Plan of Mid-Jersey Trucking	-10.3	51.1	77.5	2,067	2028
ILA PRSSA Pension Fund	-10.0	56.9	83.2	1,153	2028

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2015); and U.S. Department of Labor (2017).

Table A4. *Additional Plans Projected to Become Insolvent within 20 Years, 2015*

Plan status Plan name	Cash flow	Funded ratio		Total members	Exhaustion date
		Current	Actuarial		
Red zone: Critical					
New England Teamsters & Trucking	-9.8%	20.8%	39.5%	72,390	2027
Bakery Drivers Local 802	-9.7	31.7	47.8	1,691	2031
UFCW Tri-State Food Industry Employers	-9.4	30.8	57.1	33,176	2031
Warehousemen's Distributors Association	-9.3	40.5	63.0	4,586	2030
Central New York Painters & Allied Trades	-9.0	31.8	43.7	498	2029
Local 298	-9.0	17.1	35.4	490	2027
Employees of UFW of America	-8.9	32.8	55.6	105	2028
Local 445	-8.8	50.9	81.5	3,409	2031
Laborers' Local 130	-8.5	32.9	57.4	904	2027
Dairy Employees Local 17 Christian Labor Assoc.	-8.3	50.6	65.7	859	2032
IBEW Local 237	-7.9	17.5	39.3	406	2028
Toledo Roofers Local 134	-7.8	37.7	65.7	520	2033
Pacific Coast Shipyards	-7.8	56.4	86.1	755	2032
Ohio Carpenters' Pension	-7.5	36.2	69.9	28,063	2033
UFCW Local 1	-7.5	28.1	50.2	23,171	2029
Local 2066	-7.4	45.9	67.7	248	2035
Local 1158 IBEW - PA	-6.8	40.2	63.7	1,379	2035
Hagerstown Motor Carriers & Teamsters	-6.6	42.8	64.1	1,735	2035
Alaska Teamsters	-6.5	40.6	61.3	9,352	2033
Local 73	-5.7	33.7	50.0	813	2035
Southwest Marine Pension	-3.5	36.4	62.4	520	2035
Yellow zone					
San Diego County Cement Masons	-9.2	32.9	61.5	979	2028
Frost & Heat Insulators Local 40	-8.3	46.6	77.1	202	2031
Plumbers/Steamfitters Local 150	-8.2	47.6	80.5	1,469	2031
Green zone					
Southwest Regional Council of Carpenters	-9.9	68.4	95.4	3,377	2028
Pressroom Unions Fund	-9.7	63.3	100.4	1,872	2033
Plasterers 79	-8.8	109.6	109.0	87	2032
UFCW International Union Plan	-8.1	59.3	90.6	7,630	2033
Plumbers/Steamfitters Local 489	-7.4	51.1	95.2	212	2031
Teamsters Local 786 Vending	-7.3	76.3	102.4	525	2035

Sources: Authors' calculations from U.S. Department of Labor, *Form 5500* (2016); and U.S. Department of Labor (2017).