Pension Funding and the Economy: Would "Proper" Funding Cost Jobs?

By Dean Baker and Nick Buffie*

There is an ongoing debate in policy circles about the appropriate accounting standards for public sector pension funds. There are major differences between the standard practice of most pension funds and the policies that are advocated by many academic economists, most notably Robert Novy-Marx and Joshua Rauh (NM&R). In several papers they argue that most public sector pension funds are severely underfunded.[1, 2] In recent years, most public sector pensions have been less than fully funded even using standard pension fund accounting. However, according to NM&R, the shortfalls are two to four times as large as indicated by standard pension accounting.

While they raise a variety of issues about the accounting standards used by public sector funds, the two most important are the discount rate applied to pension fund liabilities and the time period over which the finances are assessed. NM&R argue that instead of using the expected return of pension fund assets to discount future liabilities, pensions should use the risk free interest rate on Treasury bonds. This leads to a considerably higher present discounted value on pension fund liabilities. The other major difference between NM&R's methodology and the standard practice in pension accounting is that they propose a 15-year time horizon.[3] This compares with the conventional 30-year planning period for most pension funds. This means that any shortfall must be made up over a considerably shorter period of time.

There has been considerable debate over the appropriateness of the standards recommended by NM&R. For example, an accounting rule that does not credit the higher returns on risky assets, like

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1   See, for example, Novy-Marx, Robert, and Joshua Rauh (2008, 2009, 2011a, 2011b).
2   See also Novy-Marx, Robert, and Joshua Rauh (2012) and Rauh (2010, 2011).
3   Novy-Marx and Rauh (2009), pp. 200-205.

* Dean Baker is an Economist and co-Director at Center for Economic and Policy Research (CEPR). Nick Buffie is a Research Associate at CEPR.

equities, could discourage pension fund managers from investing in equities or other risky assets. This could lead to a perverse situation in which individuals holding retirement funds in individual accounts assume the timing risk associated with holding equities, while pension funds, which invest collectively, do not. Another major issue with the NM&R approach is that it would lead to extraordinarily pro-cyclical funding patterns, especially if pension funds continued to invest in equities.[4] Stock market downturns generally coincide with recessions, meaning that pension assets would be lower during a downturn. At the same time, interest rates also typically decline in a downturn, which would raise pension fund liabilities. The combined effect is to increase the size of the measured shortfall in a downturn.

If pension funds respond by increasing their annual contribution, then state and local governments would have to increase their operating surplus during a downturn. This implies some combination of tax increases and spending cuts would be needed to make the additional payments implied by the shortfall. With most pension funds in a similar situation, the aggregate impact on the economy is likely to be substantial. At a time when more stimulus from the government sector would be desirable, this pattern of pension fund financing could be highly contractionary.

In order to get a sense of the plausible size of this impact, this paper calculates the impact on the economy of adopting NM&R funding rules during the last recession. Specifically, it calculates the impact on GDP and employment if state governments had decided to fill the funding gap calculated by NM&R over a 15-year time horizon, as they advocate.

The basic calculation is straightforward. The NM&R annual funding level would be the amount of new liabilities accrued by the fund each year, plus one-fifteenth of the shortfall they calculated. The amount of new liabilities for each state is taken from the Center for Retirement Research at Boston College.[5] We subtract the actual contribution reported for each state for the year. The difference is the additional amount of funding that the state would have needed to raise through a mix of spending cuts and additional taxes. This is shown in **Table 1** below.

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4   The problem of pro-cyclicality in pension fund financing is discussed in Baker (2011), Baker and Rosnick (2012), and Weller and Baker (2005).
5   Center for Retirement Research at Boston College (2015).

TABLE 1

Cuts to State's Budgets to Cover Pension Shortfalls								
	Cuts to State Budget (billions of dollars)			Gross State Product (GSP) (billions of dollars)			Cuts (share of GSP)		
	2009	2010	2011	2009	2010	2011	2009	2010	2011
Alabama	$5.2	$5.1	$4.3	$169.4	$176.4	$182.4	3.1%	2.9%	2.4%
Alaska	$1.6	$2.1	$1.6	$49.7	$52.7	$56.9	3.3%	3.9%	2.8%
Arizona	$6.4	$6.4	$6.1	$243.3	$248.5	$257.0	2.6%	2.6%	2.4%
Arkansas	$3.1	$3.1	$3.3	$101.0	$106.0	$110.9	3.1%	2.9%	2.9%
California	$68.0	$59.0	$67.7	$1,915.7	$1,966.6	$2,034.0	3.5%	3.0%	3.3%
Colorado	$4.0	$6.5	$6.3	$250.3	$258.2	$266.6	1.6%	2.5%	2.4%
Connecticut	$5.9	$5.8	$4.9	$227.0	$232.5	$234.0	2.6%	2.5%	2.1%
Delaware	$0.7	$0.7	$0.8	$56.2	$57.5	$59.3	1.2%	1.1%	1.4%
Florida	$18.8	$10.1	$15.4	$722.8	$730.9	$736.9	2.6%	1.4%	2.1%
Georgia	$6.1	$10.1	$8.3	$406.1	$412.2	$424.5	1.5%	2.5%	2.0%
Hawaii	$2.4	$2.2	$2.9	$65.3	$67.7	$70.1	3.7%	3.2%	4.2%
Idaho	$1.4	$1.3	$1.3	$54.2	$55.7	$57.1	2.5%	2.4%	2.3%
Illinois	$23.6	$28.5	$23.9	$641.9	$655.0	$680.4	3.7%	4.3%	3.5%
Indiana	$3.9	$4.9	$4.0	$263.4	$283.0	$291.4	1.5%	1.7%	1.4%
Iowa	$3.2	$2.1	$3.5	$137.6	$142.3	$150.3	2.3%	1.5%	2.3%
Kansas	$2.8	$2.7	$2.4	$122.0	$127.9	$136.6	2.3%	2.1%	1.8%
Kentucky	$5.8	$5.5	$6.0	$156.5	$166.2	$172.9	3.7%	3.3%	3.5%
Louisiana	$4.5	$4.8	$4.1	$210.8	$233.2	$241.8	2.1%	2.1%	1.7%
Maine	$1.8	$1.4	-$0.1	$50.5	$51.7	$52.0	3.5%	2.8%	-0.3%
Maryland	$6.2	$5.3	$5.8	$303.7	$314.4	$323.1	2.1%	1.7%	1.8%
Massachusetts	$6.4	$6.3	$6.5	$381.6	$398.1	$412.7	1.7%	1.6%	1.6%
Michigan	$7.8	$10.7	$8.8	$366.4	$386.6	$398.9	2.1%	2.8%	2.2%
Minnesota	$7.8	$1.7	$6.4	$259.9	$273.0	$285.5	3.0%	0.6%	2.3%
Mississippi	$4.5	$3.3	$3.7	$92.4	$95.5	$97.8	4.9%	3.4%	3.8%
Missouri	$6.4	$6.3	$1.9	$249.8	$256.2	$258.0	2.6%	2.4%	0.7%
Montana	$1.1	$1.3	$0.9	$35.4	$37.3	$40.2	3.2%	3.4%	2.3%
Nebraska	$1.0	$1.0	$1.1	$87.2	$91.8	$99.0	1.2%	1.1%	1.1%
Nevada	$4.3	$3.7	$3.5	$119.1	$119.5	$122.4	3.6%	3.1%	2.9%
New Hampshire	$1.3	$1.1	$1.7	$60.7	$62.9	$64.2	2.2%	1.8%	2.6%
New Jersey	$18.5	-$1.7	$15.1	$484.8	$494.1	$498.9	3.8%	-0.3%	3.0%
New Mexico	$4.0	$3.1	$4.1	$81.1	$84.0	$86.7	4.9%	3.7%	4.7%
New York	$19.9	$23.2	$20.3	$1,143.0	$1,199.4	$1,234.1	1.7%	1.9%	1.6%
North Carolina	$6.9	$7.2	$6.4	$410.5	$422.1	$433.3	1.7%	1.7%	1.5%
North Dakota	$0.5	$0.8	$0.5	$32.0	$35.3	$40.5	1.7%	2.1%	1.2%
Ohio	$22.6	$22.9	$24.6	$477.6	$494.4	$520.4	4.7%	4.6%	4.7%
Oklahoma	$4.0	$4.3	-$1.4	$143.5	$152.1	$162.1	2.8%	2.8%	-0.9%
Oregon	$4.3	$5.5	$5.5	$180.6	$191.5	$200.9	2.4%	2.9%	2.7%
Pennsylvania	$14.1	$15.0	$17.8	$566.5	$585.7	$602.7	2.5%	2.6%	2.9%
Rhode Island	$1.9	$3.5	-$1.4	$47.9	$49.3	$49.9	4.0%	7.2%	-2.9%
South Carolina	$4.8	$5.0	$2.6	$161.6	$165.4	$171.6	3.0%	3.0%	1.5%
South Dakota	$0.9	$0.5	$0.8	$36.9	$38.7	$42.4	2.5%	1.3%	1.9%
Tennessee	$3.4	$4.6	$4.6	$248.0	$253.7	$264.1	1.4%	1.8%	1.7%
Texas	$22.5	$20.7	$21.0	$1,168.9	$1,247.6	$1,350.8	1.9%	1.7%	1.6%
Utah	$2.6	$2.0	$2.3	$113.9	$118.5	$124.7	2.3%	1.7%	1.8%
Vermont	$0.5	$0.3	$0.6	$25.3	$26.5	$27.6	1.9%	1.2%	2.3%
Virginia	$7.7	$10.4	$6.3	$410.3	$424.2	$432.2	1.9%	2.5%	1.5%
Washington	$6.9	$6.8	$6.7	$351.0	$362.5	$372.4	2.0%	1.9%	1.8%
West Virginia	$1.4	$1.5	$1.6	$63.1	$66.2	$69.9	2.3%	2.3%	2.2%
Wisconsin	$7.8	$7.7	$4.4	$246.1	$254.3	$263.8	3.2%	3.0%	1.7%
Wyoming	$0.9	$0.8	$0.7	$37.9	$40.2	$43.1	2.4%	2.0%	1.6%
50 States	*$372.2*	*$346.8*	*$349.8*	*$14,230.3*	*$14,765.4*	*$15,308.7*	*2.6%*	*2.3%*	*2.3%*

Source and notes: Center for Retirement Research at Boston College and authors' calculations.

As can be seen, the larger states generally would have needed the most additional revenue using this calculation, but several states with serious pension funding problems would need disproportionate cuts. For example, the cuts in Illinois would be equal to 3.7 percent of Gross State Product (GSP) in 2009. In New Jersey they would be equal to 3.8 percent and 4.7 percent in Ohio. The additional pension funding implied by this calculation would also have large impacts on Mississippi and New

Mexico, which would have needed cuts and/or revenue increases equal to 4.9 percent of GSP.

The next question is the impact on GDP and employment, given the depressed state of the economy. While in ordinary times the impact of spending cuts and/or tax increases may be largely offset by other spending from the private sector, this would likely not have been true in these years. Following other research on the impact of spending and tax cuts on the economy during the downturn we assume a multiplier of 1.5 for the cuts and tax increases imposed by the states to make up their pension shortfalls.[6, 7]

A first set of calculations simply sums the additional pension funding across all states. As shown in Table 1, the additional funding would have been equal to 2.6 percent of GDP in 2009 and 2.3 percent of GDP in 2010 and 2011. Assuming a multiplier of 1.5, this translates into declines in output of 3.9, 3.5, and 3.4 percent in 2009, 2010, and 2011, respectively. For simplicity we assume the job loss is proportionate to the drop in GDP.

We next calculate the impact at the state level assuming that all states had suffered the same proportionate decline in GDP and job loss regardless of their level of pension underfunding. In effect, this assumes a $1 billion cut in spending in California has the same impact on Wisconsin's economy as a $1 billion cut in spending in Wisconsin. The implied reductions in GDP and employment are reported in **Tables 2a** and **2b,** respectively.

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6 Acconcia and Simonelli (2011), Auerbach and Gorodnichenko (2012), Belinga and Ngouana (2015), Clemens and Miran (2010), Congressional Budget Office (2012), Feyrer and Sacerdote (2011), Nakamura and Steinsson (2014), Reichling and Whalen (2012), Romer and Romer (2010), Serrato and Wingender (2010), Whalen and Reichling (2015), Woodford (2011), and Zandi (2008).
7 Daniel Shoag found that the multiplier for public pension spending is greater than 2. See Shoag (2015).

TABLE 2a

Lost Output Due to Additional Funding for Public Pensions Assuming Declines are Proportionate to Each State's GSP

(millions of dollars)

	2009	2010	2011
Alabama	$6,600	$6,200	$6,300
Alaska	$1,900	$1,900	$2,000
Arizona	$9,500	$8,800	$8,800
Arkansas	$4,000	$3,700	$3,800
California	$75,200	$69,300	$69,700
Colorado	$9,800	$9,100	$9,100
Connecticut	$8,900	$8,200	$8,000
Delaware	$2,200	$2,000	$2,000
Florida	$28,400	$25,700	$25,300
Georgia	$15,900	$14,500	$14,500
Hawaii	$2,600	$2,400	$2,400
Idaho	$2,100	$2,000	$2,000
Illinois	$25,200	$23,100	$23,300
Indiana	$10,300	$10,000	$10,000
Iowa	$5,400	$5,000	$5,200
Kansas	$4,800	$4,500	$4,700
Kentucky	$6,100	$5,900	$5,900
Louisiana	$8,300	$8,200	$8,300
Maine	$2,000	$1,800	$1,800
Maryland	$11,900	$11,100	$11,100
Massachusetts	$15,000	$14,000	$14,100
Michigan	$14,400	$13,600	$13,700
Minnesota	$10,200	$9,600	$9,800
Mississippi	$3,600	$3,400	$3,400
Missouri	$9,800	$9,000	$8,800
Montana	$1,400	$1,300	$1,400
Nebraska	$3,400	$3,200	$3,400
Nevada	$4,700	$4,200	$4,200
New Hampshire	$2,400	$2,200	$2,200
New Jersey	$19,000	$17,400	$17,100
New Mexico	$3,200	$3,000	$3,000
New York	$44,800	$42,300	$42,300
North Carolina	$16,100	$14,900	$14,900
North Dakota	$1,300	$1,200	$1,400
Ohio	$18,700	$17,400	$17,800
Oklahoma	$5,600	$5,400	$5,600
Oregon	$7,100	$6,700	$6,900
Pennsylvania	$22,200	$20,600	$20,700
Rhode Island	$1,900	$1,700	$1,700
South Carolina	$6,300	$5,800	$5,900
South Dakota	$1,400	$1,400	$1,500
Tennessee	$9,700	$8,900	$9,100
Texas	$45,900	$44,000	$46,300
Utah	$4,500	$4,200	$4,300
Vermont	$1,000	$900	$900
Virginia	$16,100	$14,900	$14,800
Washington	$13,800	$12,800	$12,800
West Virginia	$2,500	$2,300	$2,400
Wisconsin	$9,700	$9,000	$9,000
Wyoming	$1,500	$1,400	$1,500

Source and notes: Center for Retirement Research at Boston College and authors' calculations.

TABLE 2b

Jobs Lost by State Assuming Output Declines are Proportionate to Each State's GSP			
(number of jobs)			
	2009	2010	2011
Alabama	74,000	66,000	64,000
Alaska	13,000	11,000	11,000
Arizona	95,000	84,000	83,000
Arkansas	46,000	41,000	40,000
California	564,000	501,000	492,000
Colorado	88,000	78,000	77,000
Connecticut	64,000	57,000	56,000
Delaware	16,000	15,000	14,000
Florida	284,000	253,000	249,000
Georgia	153,000	136,000	134,000
Hawaii	23,000	21,000	20,000
Idaho	24,000	21,000	21,000
Illinois	222,000	198,000	195,000
Indiana	110,000	99,000	97,000
Iowa	58,000	52,000	51,000
Kansas	53,000	47,000	46,000
Kentucky	69,000	62,000	61,000
Louisiana	75,000	66,000	65,000
Maine	23,000	21,000	20,000
Maryland	99,000	89,000	87,000
Massachusetts	126,000	113,000	111,000
Michigan	152,000	136,000	135,000
Minnesota	104,000	93,000	92,000
Mississippi	43,000	38,000	37,000
Missouri	106,000	94,000	91,000
Montana	17,000	15,000	15,000
Nebraska	37,000	33,000	33,000
Nevada	45,000	39,000	39,000
New Hampshire	25,000	22,000	22,000
New Jersey	153,000	136,000	132,000
New Mexico	32,000	28,000	28,000
New York	335,000	301,000	298,000
North Carolina	153,000	136,000	134,000
North Dakota	14,000	13,000	14,000
Ohio	199,000	177,000	175,000
Oklahoma	61,000	55,000	54,000
Oregon	63,000	56,000	56,000
Pennsylvania	220,000	198,000	195,000
Rhode Island	18,000	16,000	16,000
South Carolina	71,000	64,000	63,000
South Dakota	16,000	14,000	14,000
Tennessee	103,000	92,000	91,000
Texas	404,000	364,000	362,000
Utah	47,000	42,000	41,000
Vermont	12,000	10,000	10,000
Virginia	143,000	128,000	126,000
Washington	112,000	100,000	99,000
West Virginia	29,000	26,000	26,000
Wisconsin	108,000	96,000	94,000
Wyoming	11,000	10,000	10,000
Source and notes: Center for Retirement Research at Boston College and authors' calculations.			

Obviously, tax increases or spending cuts within a state are likely to have more impact on the state's economy than cuts taking place in other states. The difference will depend in part on the size of the state and also the distance from states experiencing large cuts. Cuts in spending in Alaska will have relatively little impact on the GDP of Nebraska. On the other hand, there is likely to be substantial spillover from cuts in Massachusetts to Rhode Island. In order to get a simplified calculation of the

effect of the cuts within each state, we assume that the GSP loss in each state would have been equal to its own cuts plus 0.5 times its proportionate share of the total cuts. Whereas the calculations for Table 2a assume a multiplier of 1.5 for the nation as a whole, the calculations in Table 3a assume two separate multipliers which sum to 1.5 for the nation as a whole. A multiplier of 1.0 is applied to cuts within the given state, while a multiplier of 0.5 is applied to the aggregate cuts across the 50 states. For example, according to this calculation, the reduction in GSP in California in 2009 would be equal to the state's own $68 billion in cuts that year, plus 0.5 times its proportionate share of the country's $372 billion in cuts. The total lost GSP for California in 2009 by this calculation is $93 billion.

Tables 3a and **3b** show the loss in GSP and jobs using this calculation.

TABLE 3a

Lost Output due to Additional Funding for Public Pensions, Authors' Preferred Methodology			
(millions of dollars)			
	2009	**2010**	**2011**
Alabama	$7,400	$7,100	$6,400
Alaska	$2,300	$2,700	$2,200
Arizona	$9,600	$9,300	$9,000
Arkansas	$4,400	$4,300	$4,500
California	$93,000	$82,100	$91,000
Colorado	$7,300	$9,600	$9,400
Connecticut	$8,800	$8,600	$7,600
Delaware	$1,400	$1,300	$1,500
Florida	$28,300	$18,700	$23,800
Georgia	$11,400	$15,000	$13,200
Hawaii	$3,300	$3,000	$3,700
Idaho	$2,100	$2,000	$2,000
Illinois	$32,000	$36,200	$31,700
Indiana	$7,400	$8,200	$7,300
Iowa	$5,000	$3,800	$5,200
Kansas	$4,400	$4,200	$4,000
Kentucky	$7,900	$7,400	$8,000
Louisiana	$7,300	$7,600	$6,800
Maine	$2,400	$2,000	$400
Maryland	$10,200	$9,000	$9,500
Massachusetts	$11,400	$10,900	$11,200
Michigan	$12,600	$15,200	$13,300
Minnesota	$11,200	$4,900	$9,700
Mississippi	$5,700	$4,400	$4,800
Missouri	$9,700	$9,300	$4,800
Montana	$1,600	$1,700	$1,400
Nebraska	$2,200	$2,100	$2,200
Nevada	$5,900	$5,200	$4,900
New Hampshire	$2,100	$1,900	$2,400
New Jersey	$24,800	$4,100	$20,800
New Mexico	$5,100	$4,100	$5,100
New York	$34,800	$37,300	$34,400
North Carolina	$12,200	$12,100	$11,400
North Dakota	$1,000	$1,200	$1,000
Ohio	$28,800	$28,700	$30,500
Oklahoma	$5,800	$6,100	$500
Oregon	$6,700	$7,800	$7,800
Pennsylvania	$21,500	$21,800	$24,600
Rhode Island	$2,500	$4,100	($900)
South Carolina	$7,000	$7,000	$4,600
South Dakota	$1,400	$1,000	$1,300
Tennessee	$6,600	$7,600	$7,600
Texas	$37,800	$35,300	$36,400
Utah	$4,100	$3,400	$3,700
Vermont	$800	$600	$900
Virginia	$13,100	$15,400	$11,200
Washington	$11,500	$11,000	$10,900
West Virginia	$2,300	$2,300	$2,400
Wisconsin	$11,000	$10,700	$7,400
Wyoming	$1,400	$1,300	$1,200
Source and notes: Center for Retirement Research at Boston College and authors' calculations.			

Jobs Lost by State, Authors' Preferred Methodology			
(number of jobs)			
	2009	2010	2011
Alabama	82,000	76,000	66,000
Alaska	15,000	16,000	13,000
Arizona	96,000	89,000	85,000
Arkansas	51,000	47,000	48,000
California	698,000	593,000	642,000
Colorado	65,000	82,000	80,000
Connecticut	63,000	59,000	52,000
Delaware	10,000	10,000	11,000
Florida	283,000	183,000	234,000
Georgia	109,000	140,000	121,000
Hawaii	30,000	26,000	32,000
Idaho	24,000	21,000	21,000
Illinois	282,000	310,000	264,000
Indiana	78,000	81,000	71,000
Iowa	54,000	39,000	52,000
Kansas	49,000	44,000	39,000
Kentucky	89,000	79,000	82,000
Louisiana	66,000	61,000	54,000
Maine	29,000	23,000	5,000
Maryland	85,000	72,000	74,000
Massachusetts	96,000	88,000	88,000
Michigan	133,000	152,000	132,000
Minnesota	114,000	47,000	91,000
Mississippi	68,000	50,000	54,000
Missouri	104,000	96,000	50,000
Montana	19,000	20,000	15,000
Nebraska	23,000	22,000	21,000
Nevada	57,000	48,000	45,000
New Hampshire	22,000	19,000	24,000
New Jersey	199,000	32,000	160,000
New Mexico	51,000	39,000	47,000
New York	260,000	266,000	242,000
North Carolina	116,000	111,000	103,000
North Dakota	11,000	12,000	9,000
Ohio	306,000	292,000	300,000
Oklahoma	64,000	62,000	4,000
Oregon	60,000	65,000	63,000
Pennsylvania	214,000	210,000	233,000
Rhode Island	24,000	38,000	(8,000)
South Carolina	78,000	76,000	49,000
South Dakota	15,000	10,000	13,000
Tennessee	70,000	78,000	77,000
Texas	333,000	293,000	285,000
Utah	42,000	34,000	36,000
Vermont	10,000	7,000	10,000
Virginia	116,000	132,000	96,000
Washington	94,000	86,000	84,000
West Virginia	27,000	26,000	26,000
Wisconsin	122,000	115,000	77,000
Wyoming	11,000	9,000	8,000
50 States	5,117,000	4,588,000	4,478,000

Source and notes: Center for Retirement Research at Boston College and authors' calculations.

Had states cut their pensions in line with the methodology endorsed by NM&R, 5.1 million jobs would have been lost in 2009 as a result. California would have lost 698,000 jobs, followed by Texas with 333,000 lost jobs and Ohio with 306,000.

Even the states with relatively few lost jobs would have experienced large declines in employment

relative to the size of their labor forces. In 2009, employment would have fallen 6.2 percent in New Mexico and Mississippi and 6.0 percent in Ohio. Employment would have also declined 5.0 percent or more in Hawaii, Illinois, Kentucky, New Jersey, and Rhode Island. In the three states with the smallest absolute number of lost jobs — Delaware, North Dakota, and Wyoming, which would've lost between 10,000 and 11,000 jobs each — employment would have declined 2.5 percent, 3.0 percent, and 3.7 percent, respectively. All 50 states would have lost jobs in 2009 and 2010, and 49 states would have lost jobs in 2011. This indicates that cutting public pension benefits in the middle of a recession would have been harmful in every state.

The current debate over public pension fund accounting has raised many serious questions. However, it is important that this debate incorporate a clear understanding of the macroeconomic implications of different funding rules. One advantage of the current methodology is that it largely avoids the pressure for pro-cyclical funding patterns. On the other hand, the NM&R accounting method would likely lead to highly pro-cyclical funding patterns, especially if pension funds continued to invest in equities. As a result, efforts to make up pension shortfalls would likely aggravate recessions and lead to greater job loss.

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