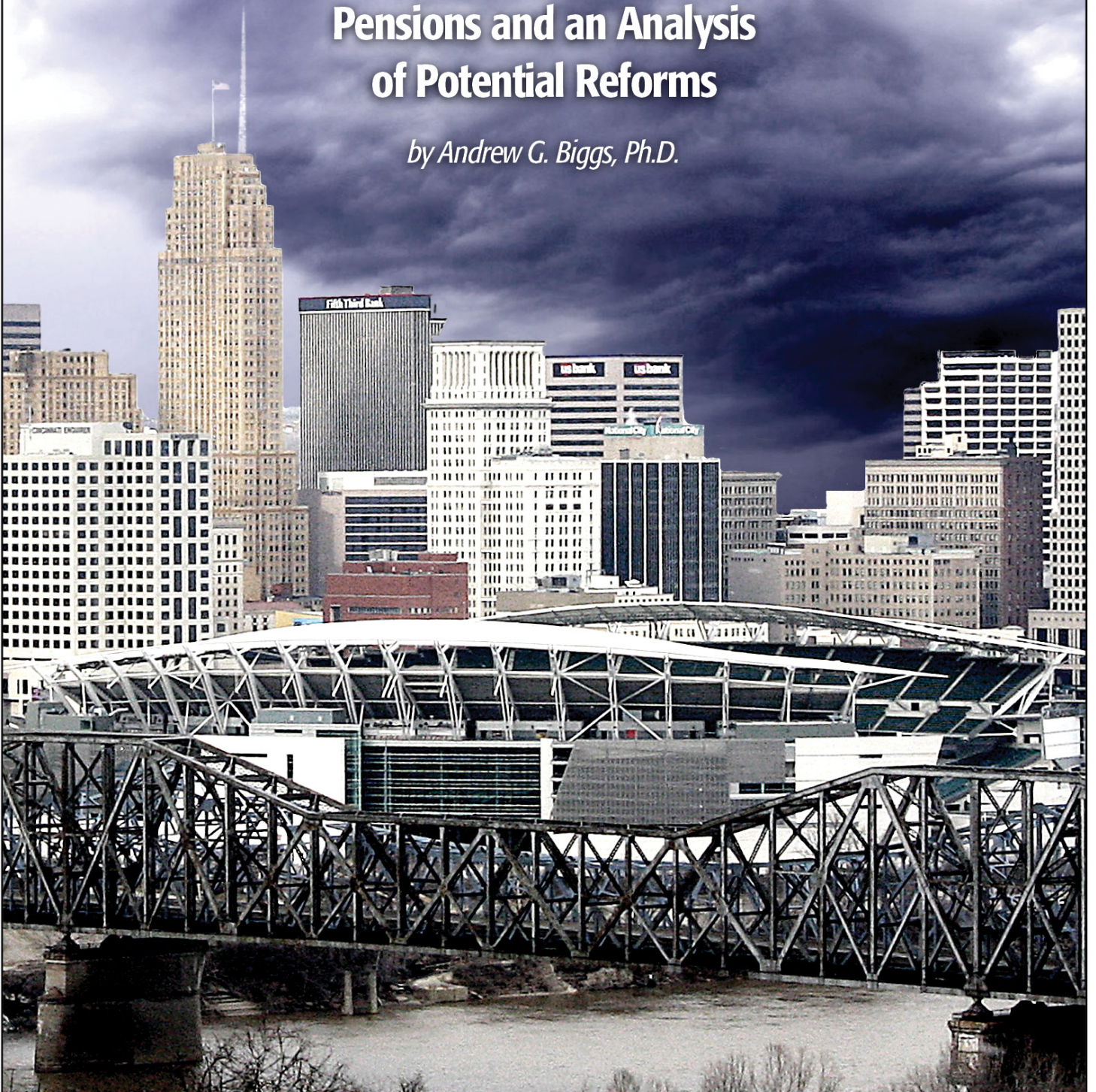


Worse Than You Think

Cincinnati's Underfunded Pensions and an Analysis of Potential Reforms

by Andrew G. Biggs, Ph.D.



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Executive summary

Cincinnati's current public employee retirement plan, the Cincinnati Retirement System (CRS), is a traditional "defined benefit" (DB) pension plan that is far less fiscally sound than commonly understood. By some accounting standards, CRS is optimistically underfunded by \$862 million. But a more accurate measure, the "fair market valuation" preferred by most economists, reveals unfunded liabilities of over \$2.5 billion and a funding ratio of only 35%. As a result of this shortfall, pension costs for the City are extremely high. Total pension costs for 2014 are projected to equal 58% of total employee payroll, with the City bearing a cost equal to almost 49% of payroll. By comparison, the median total state or local government pension contribution is equal to 13% of employee payroll.

A proposed Amendment would make several significant changes to the pension benefits paid to City employees through the CRS. Newly-hired City employees would be moved into "defined contribution" (DC) pension plans similar to 401(k) plans used in the private sector, and future benefit accruals and Cost of Living Adjustments would be reduced. This report demonstrates several significant positive effects of the proposed Amendment with regard to CRS funding and City pension costs:

- The future "normal cost" of benefit accruals would be reduced by approximately 33%;
- Based upon fair market valuation, reducing benefit accruals under the CRS would produce immediate economic savings to the City of approximately \$19.7 million per year;
- Assuming employers make the maximum contribution to the DC plan stipulated in the Amendment, City employees would receive higher total retirement benefits than private sector workers with 401(k) plans and Social Security;
- In addition, City employees would continue to receive retiree health benefits which compare favorably to the private sector;
- The largest savings to the City would not be in terms of direct pension contributions, but in reducing budgetary risk. By eliminating the accumulation of contingent pension liabilities, shifting to a DC plan would reduce the City's economic cost of providing pensions to its employees.

This report examines the funding of the CRS under both current actuarial accounting standards and so-called "fair market valuation," which economists believe gives a more accurate view of the full economic costs of pension provision. The report next analyzes how the Amendment might change DB plan benefits and required plan contributions. It then analyzes whether either current pension accounting rules or the text of the Amendment itself would require that the City speed up the amortization of unfunded CRS liabilities, which could raise funding costs for the City over the short term. Following that, the report compares the adequacy of benefits under a stylized replacement DC pension plan with those typically paid in private sector 401(k) plans combined with Social Security and how shifting to DC pensions may affect costs to the City.

Introduction

The Cincinnati Pension Reform Charter Amendment Initiative is a ballot referendum that would change the retirement benefits offered to Cincinnati public employees, most of which are delivered through the Cincinnati Retirement System (CRS).¹ The CRS has around 3,000 active participants and about 4,500 retirees and survivors who receive monthly pension benefits. The Amendment is expected to be placed on the ballot and voted upon in the November 5, 2013 election.

The Amendment's sponsoring group, the Cincinnati for Pension Reform Committee, has proposed that all newly-hired Cincinnati government employees participate in so-called "defined contribution pension plans" (DC plans), which are similar to 401(k) plans that private sector workers typically are offered by their employers. Current public employees would have the option of participating in the DC pension plan, but would not be required to do so.

The Amendment would make two significant changes to traditional defined benefit pension plans (DB plans) that are offered to current Cincinnati public employees. First, the Amendment would change how the initial retirement benefit received by a public employee is calculated. It states that this benefit

shall not exceed an annual payment equal to an employee's years of service multiplied by two percent of the average of the employee's five highest years of base compensation. The amount of such payment shall not exceed 60 percent of the average of the employee's five highest years of base compensation. The multiplier applicable to years of service that begin after June 1, 2014 shall not exceed 1.5 percent.

Retirement benefits earned to date would be paid in full, but in the future City employees would accrue benefits at a lower rate than in the past.

Second, the Amendment would alter the way in which a retired employee's annual Cost of Living Adjustments (COLAs) are calculated. It states that

Current retirees "Cost of Living Adjustments" must reflect no more than the actual rise, if any, in the cost of living. . . . Cost of Living Adjustments shall be limited to the increase in the consumer price index (Cincinnati U.S. Bureau of Labor Statistics), but at all times capped at a simple rate of 3.0 percent per fiscal year.

The Amendment, if passed, could affect both the initial benefits received under traditional defined benefit plans and the increases to those benefits that are made throughout the employee's retirement.

¹ Cincinnati Pension Reform Charter Amendment Initiative. (n.d.). Retrieved September 25, 2013 from the Ballotpedia Wiki: [http://ballotpedia.org/wiki/index.php/Cincinnati_Pension_Reform_Charter_Amendment_Initiative_\(November_2013\)](http://ballotpedia.org/wiki/index.php/Cincinnati_Pension_Reform_Charter_Amendment_Initiative_(November_2013)).

This report proceeds as follows. Before analyzing the effects of the proposed Amendment, we first assess the current funding health of the CRS. This involves a discussion of current pension accounting standards promulgated by the Government Accounting Standards Board (GASB) as well as an alternative, referred to as “fair market valuation,” which most economists believe provides a fuller picture of the obligations of public sector pensions.

We then analyze how the Amendment would alter benefits offered under the CRS, followed by a discussion of how the DC plan offered to newly-hired City employees might compare to the combination of Social Security and a 401(k) offered to most workers in the private sector.

The true cost of public sector pensions

The funding health of public employee pensions across the country has declined significantly in recent years, due to a legacy of poor investment returns, insufficient contributions over the past decade, and benefit increases enacted during the late 1990s. Although most plans appeared to be “fully funded” around the turn of the twenty-first century, according to the accounting standards employed by most plans, the typical plan today is less than three-quarters funded.² In total, public plans report unfunded liabilities of slightly under \$1 trillion. These issues are well-known in states and cities around the nation.

Less well-known is that most economists and a number of non-partisan government agencies argue that the true funding status of public plans is significantly worse than these already troubling figures. Using methods that better account for the full economic costs of public plans, these programs are much more poorly funded than previously understood. If public plans in the United States used the same accounting standards as private plans or public employee plans in other countries, most would be barely over one-half funded and total unfunded liabilities would top \$4 trillion.

According to the CRS’s actuarial firm, Cavanaugh Macdonald Consulting, the CRS is deemed to be approximately 61 percent funded.³ It holds current assets of about \$1.37 billion and has actuarially measured liabilities of \$2.23 billion, leaving an unfunded liability of around \$862 million as of the end of 2012.

More important from a budgetary standpoint are the annual contributions that the City and City employees must make to the CRS. According to Cavanaugh Macdonald, employer and employee contributions to the plan will total \$92.51 million in fiscal year 2014. These pension costs can be broken down into three categories:

- *Normal costs*: The normal cost represents the present value of future benefits accruing to employees in a given year. The total normal cost for the CRS is 10.88

² Munnell, A.H., Aubry, J., Hurwitz, J., & Medenica, M. (2013, July). The Funding of State and Local Pensions: 2012-2016. *The Center for Retirement Research at Boston College: State and Local Pension Plans*, 32.

³ See Cavanaugh Macdonald, LLC. Report of the Actuary on the Annual Valuation of the Retirement System for Employees of the City of Cincinnati Pension Report. Prepared as of December 31, 2012 and Approved by the Board of Trustees on May 2, 2013.

percent of payroll, equal to \$14.41 million in 2014. Employees contribute 9 percent of their pay to cover normal costs, with the remaining 1.88 percentage points contributed by the government.

- *Accrued liabilities*: For 2014, the City is projected to contribute \$69.38 million to amortize unfunded benefit liabilities from prior years. This amount is equal to 43.34 percent of employee payroll. Employees do not contribute toward amortization costs.
- *ERIP*: The CRS runs an Early Retirement Incentive Program with an annual cost of \$5.71 million, or 3.57 percent of employee payroll.

Table 1. Projected annual contributions, 2014		% payroll	\$million
Total Normal Cost		10.88%	\$17.42
Employee contribution		9.00%	\$14.41
Employer Normal Cost		1.88%	\$3.01
Accrued liability		43.34%	\$69.38
ERIP		3.57%	\$5.71
Total employer contribution		48.79%	\$78.10

Source: Author's calculations from Cavanaugh Macdonald report.

Total pension costs for 2014 are projected to be equal to nearly 58 percent of total employee payroll, with the City itself bearing a cost equal to 48.79 percent of payroll. (See Table 1.)

These costs, relative to the wage base, are extremely high compared to those of other state and local government plans. For 2010, the most recent year for which the Public Plans Database has comprehensive information available, the median total pension contribution was equal to 13 percent of employee payroll.⁴ Only 17 of the 126 state and local plans included in the Database had a contribution/payroll ratio equal to or greater than 25 percent. Thus, the CRS is a high-cost system even among public plans nationwide, where costs have soared over the past decade.

Academic economists and nonpartisan government agencies, however, argue that the true funding status of public plans like the CRS is far worse than these figures imply.⁵ The accounting rules followed by U.S. public sector pensions are more forgiving than those required for private sector pensions or public sector plans in other countries. An alternate approach, known as “fair market valuation,” more fully reveals the value of public sector plan liabilities and shows that public employee plans are even less well-funded than commonly thought. To understand this approach, we first must review how public plans calculate their liabilities under current practice.

The CRS and other public plans calculate their financial health by comparing their assets to their liabilities, that is, the investments they hold today relative to the benefits they must pay

⁴ Trustees of Boston College, Center for Retirement Research. (2011-2013). Available from <http://pubplans.bc.edu/pls/apex/f?p=1988:3:0>.

⁵ Academic discussions of pension accounting include Novy-Marx, R, & Rauh, J. (2009). The Liabilities and Risks of State-Sponsored Pension Plans. *Journal of Economic Perspectives*, 23(4), 191-210; and Biggs, A. G. (2011). An Options Pricing Method for Calculating the Market Price of Public Sector Pension Liabilities. *Public Budgeting and Finance*, Fall 2011.

in the future. Using these figures they calculate the funding ratio – that is, assets divided by liabilities – and the plan’s unfunded liability, which is the net of assets and liabilities.

The key question for pension valuation is how to assign a value today to benefit liabilities that will be paid years or even decades in the future. Because investments can earn interest, it is not necessary to contribute a full dollar today to fund each dollar of future liability. Without such a so-called “present value,” it is impossible to accurately compare a pension’s liabilities to the assets held by plans today and thereby determine how well funded it is. The present value of a plan’s liabilities is calculated using a method known as discounting, which functions like compound interest in reverse. Just as compound interest involves taking a current dollar amount and adding interest each year, so too, discounting begins with the future dollar amount and subtracts interest each year until a present value is reached.

The present value of a future dollar amount depends crucially upon the interest rate at which the liability is discounted. For instance, consider a debt of one dollar to be paid 20 years from now. Assuming an 8 percent discount rate produces a present value of only 21 cents. At a 4 percent discount rate, however, the present value more than doubles to 46 cents.

Under current pension accounting rules established by the GASB, a public pension plan discounts its liabilities using the rate of return the plan assumes will be generated by the portfolio of assets it holds. For the CRS, the assumed rate of return is 7.5 percent. These present value figures are used to generate the funding results discussed above, as well as the annual contributions required to maintain funding going into the future.

At first glance, this approach makes perfect sense: if you expect plan assets to appreciate 7.5 percent per year, then discounting the plan’s future liabilities at 7.5 percent will tell you the exact assets the plan would need to hold today in order to meet its liabilities in the future. If the plan is underfunded, it will tell you the extra contributions you must make in order to bring the plan back to full funding.

By contrast, economists believe the discount rate applied to a benefit liability should have *nothing* to do with how the plan’s assets are invested. To economists, the discount rate to apply to a liability should be based on the risk of the liability itself, *not* based on any assets used to fund the liability.⁶ If public pension benefits are guaranteed – as they are intended to be, as they are advertised to employees, and as many legal rulings and state constitutions have determined them to be – then they should be discounted using the interest rates that financial markets pay on guaranteed investments, such as U.S. Treasury securities.⁷

The logic behind this economic view is that although stocks, bonds and alternative investments have high expected returns, they also can be very risky. In fact, their high expected

⁶ This view derives from the Modigliani-Miller theorem of corporate finance, which holds that (under certain conditions) the value of an asset or liability is independent of how it is financed. See Modigliani, F., & Miller, M. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *American Economic Review*, 48(3), 261–297.

⁷ Brown and Wilcox discuss legal protections for accrued pension benefits in Brown, J. R. & Wilcox, D. W. (2009, May). Discounting State and Local Pension Liabilities. *American Economic Review*, 99.

returns are nothing other than compensation for the fact that although these returns may be expected, they are *not* guaranteed. But the pension’s liabilities – that is, the benefits it has promised to pay – *are* guaranteed. Thus, a pension plan – and the government, and the taxpayer – have a “contingent liability” to pay pension benefits even if the plan’s investments fail to achieve the assumed returns. The high amortization costs currently being paid by the City government to cover unfunded CRS liabilities from past years testify to these contingent liabilities.

Discounting pension liabilities using a risk-adjusted interest rate – that is, an interest rate derived from investments whose risk matches that of the benefits themselves – captures the value of these contingent liabilities.⁸ Doing so would show that public plans such as the CRS face much higher liabilities, and are much less well funded, than previously thought.

It is important to stress what fair market valuation *does not* claim: It does not assume that pensions invest only in Treasury bonds, or that the investments pensions do hold will return no more than do Treasury bonds. Rather, fair market valuation captures the full cost both of the plan’s upfront investments in risky assets and the potential costs to taxpayers of making good on benefit promises in the event that the plan’s investments not produce their promised returns.

Sidebar: What do experts say about current pension accounting rules?

The current GASB pension accounting rules understate the value of public pension liabilities, including those of the CRS. The vast majority of academic economists and nonpartisan government agencies share the same perspective regarding how to value public pension liabilities. Donald Kohn, then-Vice Chairman of the Federal Reserve Board, declared in 2008:

While economists are famous for disagreeing with each other on virtually every other conceivable issue, when it comes to this one there is no professional disagreement: The only appropriate way to calculate the present value of a very-low-risk liability is to use a very-low-risk discount rate.⁹

Similarly, the Fed’s director of research and statistics, David W. Wilcox, testified that:

These [public pension benefits] happen to be really simple cash flows to value. They’re free of credit risk. There’s only one conceptually right answer to how you discount those cash flows. You use discount rates that are free of credit risk. This is one of those things where it just really is that simple.¹⁰

In 2009, two economists from the federal government’s Bureau of Economic Analysis observed:

⁸ This is demonstrated mathematically in Biggs, A.G. (2011). Proposed GASB Rules Show Why Only Market Valuation Fully Captures Public Pension Liabilities. *Financial Analysts Journal*, 67(2), 18–22.

⁹ Kohn, D. L. (2008). Statement at the National Conference on Public Employee Retirement Systems Annual Conference. New Orleans, LA, May 20, 2008.

¹⁰ Wilcox, D. (2008). Testimony before the Public Interest Committee Forum sponsored by the American Academy of Actuaries. September 4, 2008.

If the assets of a defined-benefit plan are insufficient to pay promised benefits, the plan sponsor must cover the shortfall. This obligation represents an additional source of pension wealth for participants in an underfunded plan.¹¹

Beginning in 2013, the National Income and Product Accounts, which are the official “ledger books” of the United States economy, will measure public pension liabilities using a market-based measure that captures the full economic cost of offering guaranteed pension benefits. This means that liabilities as reported by pension plans like the CRS will now be inconsistent with those same liabilities as reported in the official ledger books of the United States.

In early 2012, the Congressional Budget Office issued a report that was widely taken as a confirmation of the fair market valuation approach:

By using the expected return on a pension plan’s assets to discount future payments to beneficiaries, the guidelines issued by the Government Accounting Standards Board (GASB) implicitly reflect an assumption that the risk to workers that states and localities will fail to pay future retirement benefits is the same as the risk that expected returns on the plan’s assets will not be realized. In fact, because the risk to future payments to beneficiaries is generally much less than the risk to the returns on typical assets held by pension plans, standard financial principles of valuation suggest that future benefit payments be discounted at a lower rate than under GASB’s guidelines. . . . By accounting for the different risks associated with investment returns and benefit payments, the fair-value approach provides a more complete and transparent measure of the costs of pension obligations. . . .¹²

In October 2012, the IGM Forum at the University of Chicago’s Booth School of Business surveyed 39 professional economists with regard to public pension discount rates. This group of highly-respected economists represents differing areas of expertise and a wide variety of outlooks on the role of government. They were asked to express their agreement or disagreement with the following statement:

By discounting pension liabilities at high interest rates under government accounting standards, many U.S. state and local governments understate their pension liabilities and the costs of providing pensions to public-sector workers.

Ninety-eight percent of the economists surveyed agreed with this proposition, with 49 percent agreeing strongly. None of the economists surveyed disagreed (a small percentage was unsure).¹³

¹¹ Reinsdorf, M. B. & Lenze, D. G. (2009, August). Defined Benefit Pensions and Household Income and Wealth. *Bureau of Economic Analysis. Research Spotlight*. Also see Lenze, D.G. (2009, April). Accrual Measures of Pension-Related Compensation and Wealth of State and Local Government Workers. *Bureau of Economic Analysis*.

¹² Congressional Budget Office. (2011, May). *The Underfunding of State and Local Pension Plans*.

¹³ For details see Chicago Booth. (2012, October 1). *U.S. State Budgets*. Retrieved from http://www.igmchicago.org/igm-economic-experts-panel/poll-results?SurveyID=SV_87dlrlXQvZkFB1r.

Also in 2012, Moody's Investor Services announced that its ratings of state and local government debt would no longer incorporate pension liabilities as measured under GASB rules. Instead, Moody's will discount pension liabilities using a corporate bond yield, similar to the way in which private pension liabilities are measured.

How would Cincinnati pensions appear under fair market valuation?

The fair market valuation approach captures the full economic cost of providing guaranteed pension benefits, regardless of how pension investments may fare. How would the CRS's funding health appear under market valuation? To test, we revalue the plan's liabilities using the yield on guaranteed long-term U.S. Treasury securities with a duration of 20 years. As of August 2013 the yield on such investments was approximately 3.5 percent.

Discounted at a 3.5 percent interest rate, total CRS liabilities rise from \$2.23 billion to \$3.94 billion. Since the plan's assets remain the same at \$1.37 billion, CRS unfunded liabilities rise from \$862 million to \$2.57 billion and its funding ratio declines from 61 percent to only 35 percent. Other public plans would suffer similar declines in reported funding health.

As noted above, in economics the valuation of a liability is distinct from the funding of that liability. Thus, an accurate assessment of CRS's funding health does not necessarily mean that the City must immediately increase its annual contributions. The City could continue to fund the CRS with the same contributions invested in the same portfolio.

It could *not* claim, however, that doing so would lead to "full funding" of the plan. Making payments at current levels might lead to an *expectation* – that is, a roughly 50 percent chance – that the program will be able to meet its liabilities going forward. But to be *truly* fully funded, meaning that the plan could pay what it owes without passing contingent liabilities onto future generations, would require higher levels of funding.

Adjustments to initial CRS benefits

Under the current CRS benefit formula, most Cincinnati public employees will receive a pension benefit at retirement equal to around 2.2 percent of their final earnings multiplied by the number of years that the individual worked for the government. "Final earnings" is generally defined as the average of the final three years of the worker's salary, although for newly hired employees the averaging period has been extended to five years. Thus, for instance, an employee with 30 years of job tenure would receive a benefit equal to about 66 percent of his final salary.

Under the terms of the Amendment, benefits already earned or accrued under the existing benefit formula would be honored. Going forward, however, benefits would be earned at a lower rate of 1.5 percent of final earnings for each additional year of job tenure. The effects of this provision on City employees nearing retirement would be limited. For instance, an employee who currently has 25 years of job tenure and planned to retire after 30 years would receive a final replacement rate of about 62.5 percent of his final earnings, a value that would be reduced to 60 percent under the Amendment's provision that benefits "shall not exceed 60 percent of the average of the employee's five highest years of base compensation."

This is compared to a replacement rate of 66 percent under the current benefit formula, a reduction of approximately 9 percent. But over time, the effects of this provision on pension benefits and overall pension costs would be significantly larger. For an employee who spent the first half of a 30-year career under the current benefit formula and the second half under the new formula, benefits would be approximately 17 percent lower. For newly hired employees who would receive a 1.5 percent replacement factor over their full career, benefits would be nearly one-third lower than under the current formula.

However, pension costs to the City and to City employees would be reduced immediately by roughly one-third. The “normal cost” of the plan, which reflects the annual cost of funding benefits accruing to pension participants in that year, would immediately reflect the change in the benefit formula. The total normal cost of the plan, according to the latest actuarial report and assuming a 7.5 percent discount rate, is 10.88 percent of wages, with 9 percentage points covered through employee contributions. The shift in the replacement factor to 1.5 percent would reduce the normal cost of the plan by around one-third. Assuming that cost reductions are distributed proportionately, this would save the City about 0.6 percent of wages and City employees would save approximately 3 percent of their wages, albeit at the cost of lower retirement benefits.

Using fair market valuation, the savings would be larger. The normal cost of newly-accruing benefits varies more relative to the discount rate than the cost of already-accrued benefits, because newly-accrued benefits are paid over a longer time horizon, over which the assumed discount rate is more important. Based on a sample of other public plans that have calculated normal costs at differing interest rates, the normal cost of a DB pension rises by approximately 36 percent compounded for each one percentage point reduction in the assumed discount rate. Thus, the factor to convert the CRS normal cost of 10.88 percent of pay (assuming a 7.5 percent discount rate) to a fair market value (assuming a 3.5 percent risk-adjusted rate) is $1.36^{(7.5-3.5)}$, or 3.42. This generates a total normal cost of 37.2 percent of payroll. Put another way, an average worker with a DC pension who invested 37.2 percent of his wages in Treasury securities would receive a retirement benefit approximately equal to what an average participant in the CRS receives.

Of that 37.2 percent total normal cost, 9 percentage points are borne by the participant through employee contributions, leaving an employer normal cost of 28.2 percent of wages. This is obviously far above the 1.88 percent current contribution rate, but that is because the plan must effectively guarantee a 7.5 percent return not only on the City’s contribution of 1.88 percent of pay, but also on the employee’s contribution of 9 percent of wages. Reducing the 37.2 percent total normal cost by one-third would reap economic savings of around 12.3 percent of wages. Since these economic savings come in the form of reduced risk, practically all of which is currently borne by the City, these savings would effectively accrue to the City rather than to CRS participants. This amount is currently approximately \$19.7 million per year, and the savings would continue to decline over time as new employees would enroll in DC pensions. DC pensions, however, would produce even larger savings in economic terms than the reductions in CRS DB pension benefits, because DC plans entail no contingent liabilities.

Adjustment to COLAs

Under the Amendment, the annual COLAs would be calculated based upon the Consumer Price Index for Cincinnati, as determined by the federal Bureau of Labor Statistics, and capped at 3 percent. Most current retirees already receive an annual COLA of 3 percent; the Amendment would likely reduce COLA payments for this group. But under the current law, most future CRS retirees will receive a COLA of only 2 percent. For these retirees, the Amendment would likely increase COLA payments.

The effect of the Amendment's COLA provision depends upon both the average rate of inflation and the variability of inflation from year to year. The CRS assumes future inflation of 3.0 percent annually. But inflation, of course, is not constant from year to year: some years experience high inflation, others little or no inflation. For instance, from 1982 through 2011, inflation in the CPI-W – which is used to calculate COLAs for Social Security benefits – averaged 3.0 percent, but with a minimum of -0.7 percent in 2009 and a maximum of 13.4 percent in 1980. Thus, while in a typical year COLAs would fully reflect inflation, in some years the 3.0 percent cap would become effective.

To test the effects of this provision, we use “Monte Carlo” techniques to generate 1,000 simulated years of inflation, based upon the variability in inflation exhibited since 1982. A Monte Carlo simulation uses computer-generated random numbers with certain specified characteristics, allowing the model to simulate things such as inflation or investment returns, which follow known patterns but nevertheless vary from year to year. We then apply the COLA provision to each year. If inflation is below 3.0 percent, a full COLA is paid; if inflation is above 3.0 percent, a 3 percent COLA is granted. The results of these simulations indicate that, on average, COLAs of around 2.5 percent per year would be granted.

Each retirement plan is different, and thus CRS's actuaries should be involved in calculating the effects of such a COLA cap on plan financing. However, as a general rule of thumb a 1 percentage point reduction in annual COLAs will reduce the present value of accrued benefit liabilities by around 10 percent.¹⁴ Thus, we could expect that the COLA provision of the Amendment would reduce CRS liabilities for current retirees by approximately 5 percent. However, it would have a similar increase in costs for future retirees. The effect on total liabilities depends upon how much of the currently accrued liability is owed to current retirees and how much is comprised of benefits earned by current workers but not yet paid out. Standard actuarial statements do not disclose the breakdown of current liabilities, so a complete actuarial analysis of the Amendment would be required to determine the net effects.

¹⁴ See Biggs, A.G. & Norcross, E. (2010, June). The Crisis in Public Sector Pensions: A Plan for New Jersey. *Mercatus Center, George Mason University*. Rauh, J. & Novy-Marx, R. (2010, October). Policy Options for State Pension Systems and Their Impact on Plan Liabilities. *Journal of Pension Economics and Finance*, 10(2), 173-194.

Does closing a DB pension plan raise costs?

One common objection to pension reform argues that shifting away from DB pensions creates “transition costs” that some contend make such a reforms cost prohibitive. The argument relies upon financial disclosure rules generated by GASB regarding how quickly a DB plan must pay down – or “amortize” – its unfunded liabilities.

The old GASB rules – specifically Statements 27 and 28 – dictated that an open plan may amortize its unfunded liabilities as a level percentage of payroll, meaning that amortization payments would start small and rise over time. A closed plan, however, must amortize its unfunded liabilities on a “level dollar” basis, meaning that initial payments are higher but following payments are lower. To be clear, a plan that follows a faster amortization schedule pays off its unfunded liabilities more quickly – which is generally considered a good thing – and has lower debt over the long run.

But these higher initial payments – which have been called “transition costs” – are a concern to states and localities where current budgets are tight. These concerns make it appear as if the greater the plan’s unfunded liabilities, the larger the transition cost and the more difficult it is to move to a DC plan that will not create more unfunded liabilities.

As University of Arkansas economist Robert Costrell has shown recently, however, the transition costs argument is far weaker than it initially appears.¹⁵ First, Costrell points out that GASB rules do not determine plan funding; they only dictate the disclosure of certain accounting figures. If a government wished to follow its current amortization schedule even as it shifted to a DC plan, nothing whatsoever prevents it from doing so. And some states that have moved to DC pensions, such as Rhode Island and Alaska, have done exactly that. Moreover, if a DC plan is made available as a new tier within the existing DB pension – as was done in Utah’s recent pension reforms – then GASB amortization rules do not even apply.

Substantively, there are neither economic nor policy reasons for a sponsoring government to alter its amortization schedule if it shifts new employees to DC plans. As Costrell points out, a pension’s unfunded liability is basically a debt that must be paid off, regardless of how many new employees enter a DB pension plan. Having new employees participate in a new DC pension makes no difference to the benefits owed by the old DB plan or the time at which benefit payments must be made.

Costrell shows that pension plans and their actuaries admit all of this, although it is often hidden in the footnotes of their reports headlining “massive transition costs.” Cavanaugh Macdonald Consulting – the actuarial firm contracted to analyze CRS finances – has stated the case well:

If the (amortization) payment is calculated using the total payroll of members in both the DB and defined contribution plans, the dollar amount of the payroll is the same as if the DB plan were still open. As a result, the (unfunded liability) is

¹⁵ Costrell, R. M. (2012, May). “GASB Won’t Let Me” – A False Objection to Public Pension Reform. *Laura and John Arnold Foundation*.

amortized at approximately the same rate of pay as would occur if the DB plan had not been closed to new hires.¹⁶

This is the plan followed by states like Alaska, which following its 2005 reforms introducing DC pensions continued to amortize its DB pension debt relative to *total* employee payroll.

Finally, in its recent updates to pension accounting – Statements 67 and 68 – GASB has dropped the previous amortization rule underlying the “transition cost” arguments. GASB makes clear that “[t]he Statements do not address how governments approach pension plan funding—a government’s policy regarding how much money it will contribute to its pension plan each year.”¹⁷ Thus, so long as pension sponsors follow a fiscally responsible course in addressing unfunded pension liabilities, so-called “transition costs” should not stand in the way of pension reforms.

Significantly, however, there *are* aspects of the Amendment that may require that unfunded liabilities for the CRS be paid off more quickly. Section 4 of the Amendment, states:

The City's retirement benefits plan must be annually audited, that audit must be disclosed to the public, and funds must be made available to pay projected future benefits.

(A) Any and all City retirement benefit systems must be audited by an independent auditor.

(B) The audit specified in Division (A) must supply complete and detailed data on the 10-year history of and 30-year projections for the pension fund’s market value of assets, liabilities, unfunded liabilities, total outflows, total benefits paid, amortized payments under current policy, the expected date under which current benefits will be fully funded and/or unfunded, and 30-year projections for good, expected, and poor returns on investment. This audit must also provide individual level data to the maximum extent permitted by law.

(C) If any independent audit demonstrates that insufficient funds will be available to pay forecasted future obligations within ten years from the date of the audit’s completion, the City must forthwith create sufficient cost savings or new revenue that, when accumulated over the time between the adverse audit and the projected shortfall, will meet those forecasted future obligations.

Section (C) potentially could require a faster amortization schedule for unfunded pension liabilities, thereby raising amortization payments in the short term while eliminating them in future years. However, these effects depend upon the interpretation of the requirements of Section (C).

¹⁶ Quoted in Costrell, R. M. (2012, May). “GASB Won’t Let Me” – A False Objection to Public Pension Reform. *Laura and John Arnold Foundation*.

¹⁷ Governmental Accounting Standards Board. (2012, June). New GASB Pension Statements to Bring about Major Improvements in Financial Reporting.

If Section (C) is taken to mean that all unfunded pension liabilities occurring at any time in the future must be addressed within the next 10 years, then amortization costs indeed would rise over that 10 year period, since the CRS currently is paying down its unfunded liabilities over 30 years.

A different reading of the Section, however, suggests that if unfunded liabilities occur within the next 10 years – meaning, benefit payments that the CRS will have insufficient resources to meet – then immediate cost reductions or revenue increases must be scheduled to meet these obligations. But, as poorly-funded as the CRS may be in the big picture, this appears very unlikely to occur. The market value of the CRS fund is currently around \$2 billion and annual benefit payments are approximately \$150 million, which implies that even if no additional contributions were made the CRS fund would be sufficient to meet all benefit payments over the next 13 years or so. In this reading, the Section requires not that all future unfunded liabilities extending over any period be addressed within 10 years, but that for any unfunded liabilities *occurring within 10 years* the City must immediately – “forthwith” – generate a plan to address them.

These are questions for lawyers to parse rather than economists, but it is not obvious that the Amendment would require a faster amortization schedule than the CRS is currently following.

Adequacy of DC pension plans

The Amendment states that all newly-hired employees would participate in defined contribution pension plans, similar to the 401(k) plans offered to most private sector workers. Some commentators have concerns with the adequacy of benefits provided under such plans, arguing that inadequate benefits might prompt the City to choose to participate in the federal Social Security program, which carries additional costs to both employers and employees.

The Amendment does not dictate the employer and employee contribution levels for the DC pension plan, making any calculations necessarily speculative. However, the Amendment does state that the City’s contribution to the DC plan should be no more than 9 percent of employee pay. We will assume that the City makes that maximum contribution, and therefore produces a total employer contribution that is comparable to the typical private sector employer Social Security payroll tax of 6.2 percent of wages plus a 3 percent employer match to a defined contribution pension.¹⁸

This City government contribution would generate higher total benefits for employees than a comparable contribution made by a private sector employer, because Social Security, in which private sector workers must participate but City employers do not, is a significantly underfunded program. This underfunding means that part of the contributions made to Social Security go toward covering unfunded liabilities rather than generating new benefits for employees, just as part of the total pension contribution made by the City to the CRS goes

¹⁸ See Bureau of Labor Statistics. (2010). Savings and thrift plans: Maximum potential employer contribution,(1) private industry workers, National Compensation Survey, 2010. Retrieved from <http://www.bls.gov/ncs/ebs/detailedprovisions/2010/ownership/private/table28a.txt>.

toward unfunded liabilities rather than newly-accruing benefits. This portion of the contribution is effectively a “tax” that does not result in higher benefits for employees. City employees could remain outside of Social Security and thus be exempt from this de facto tax.

As a pay-as-you-go system, Social Security’s accounting differs from a pre-funded DB pension plan, but it is possible to estimate de facto “normal costs” for Social Security participants. The de facto normal costs reflect the contributions that result in benefits that will be paid to participants, as distinct from contributions that fund Social Security’s unfunded obligations. Social Security’s actuaries publish “money’s worth ratios,” which represent the ratio of lifetime benefits received from the system to lifetime taxes paid, both in present value terms.¹⁹ This ratio represents the share of the 12.4 percent Social Security payroll tax which can be considered the normal cost of the system – meaning, the part the participant will receive back in full – with the remainder being a “pure tax” devoted to addressing the program’s unfunded liabilities.

The Social Security Administration figures show that for a two-earner couple born in 1964 with earnings equal to 160 percent of the national average – a decent approximation of the typical state or local government employee – Social Security will pay total lifetime benefits equal to 83 percent of the taxes paid into the program.²⁰ What this means is that of the 12.4 percent payroll tax, only 83 percent – that is, 10.3 percentage points – generate actuarially fair benefits to the participant. This figure includes Social Security retirement, as well as survivors and disability benefits. The remaining 2.1 percentage points can be viewed as similar to the amortization payments made under the current Cincinnati DB plan: they are indeed pension contributions, but they do not generate additional benefits for the contributor. Because the employee must contribute 6.2 percent of wage to Social Security, we can view the *effective* employer contribution as approximately 4.1 percent of pay.

Thus, the total effective employer contribution for a typical private sector combination of Social Security and a 401(k) plan is only around 7.1 percent of wages – 4.1 percentage points generate benefits under Social Security, while around 3 percent is contributed by the employer to the employee’s 401(k) account.²¹ This compares to the approximately 9 percent of pay that would be contributed under a hypothetical Cincinnati DC pension plan.

One could expect, therefore, that total retirement benefits for a City employee under a DC plan funded with only a 9 percent employer contribution would be roughly 25 percent higher than those received by a typical private sector worker participating in Social Security and a 401(k) plan. To make up this gap, the private sector employee would need to make larger personal contributions to his 401(k) than would a City employee with a DC pension plan.

¹⁹ Office of the Chief Actuary, Social Security Administration. (2013, March). Money’s Worth Ratios Under the OASDI Program for Hypothetical Workers.

²⁰ This is calculated under a baseline that accounts for Social Security being underfunded. See Office of the Chief Actuary, Social Security Administration. (2013, March). Money’s Worth Ratios Under the OASDI Program for Hypothetical Workers.

²¹ It makes no difference whether the 2.1 percentage points of the Social Security tax that does not generate actuarially fair benefits is attributed to the employer or employee share; for simplicity of comparison, I here deduct it from the 6.2 percent employer contribution.

In addition, City employees are eligible to receive retiree health benefits that have a normal cost of around 4.2 percent of wages, according to the latest actuarial valuation.²² Very few private sector employees receive such benefits, meaning that the City's total retirement package would likely remain very competitive with the private sector should the Amendment be passed and implemented.

But how would moving newly-hired employees to DC plans affect the City's budget? On paper, shifting to DC pensions might not save the City money in the short run. Most of the City's current pension contribution is dedicated to amortizing unfunded liabilities from prior years. Shifting to DC plans does not make these unfunded liabilities go away. Moreover, the City's contribution toward the "normal cost" of accruing employee benefits is currently only 1.9 percent of pay, less than the 9 percent maximum contribution outlined in the Amendment.

So does this mean that shifting to DC pensions is a money-loser for the City? Not at all. Shifting to DC pensions has one major advantage for the City budget: reducing the risk of future unfunded pension liabilities – and that risk is both large and costly. Due to the year-to-year fluctuations in investment returns, a pension could receive significantly lower returns even over the time horizons that matter for its financing. The mid-point of a typical plan's liabilities lies around 15 years in the future. Over such a time frame, the standard deviation of annual returns for a typical plan portfolio is approximately 3.1 percent. This suggests that a plan "expecting" 7.5 percent returns might have a roughly 16 percent probability of receiving "long term" returns of less than 4.4 percent. Given that a plan's liabilities and annual contributions rise by about 20 percent for each 1 percent change in the discount rate, such a result could be financially ruinous for the CRS and the City.

As discussed above, this risk is not well-illustrated in standard pension accounting reports, but it is important nonetheless. The City currently contributes only 1.88 percent of employee pay toward the "normal cost" of accruing pension benefits. This amount is not comparable to the employer contribution to a DC pension account, however, because the CRS contribution comes with a contingent liability to make good on pension benefits should investments not generate their assumed returns. A DC pension comes with no such guarantee.

Here is another way to consider the issue: When a DB pension discounts its liabilities at a 7.5 percent interest rate, this is mathematically equivalent to paying employees a 7.5 percent guaranteed return on both their own contributions and those made by their employer. Some employees would receive more and some less, based principally on the length of their career, but on average participants are paid an internal rate of return on contributions equal to the discount rate assumed for plan investments.²³ Thus, even if employees make most of the pension contribution up front, the employer bears most of the economic cost because the employer bears the responsibility for ensuring that the 7.5 percent effective guaranteed return is paid. By

²² See Cavanaugh McDonald Consulting. Report of the Actuary on the Annual Valuation of the Retirement System for Employees of the City of Cincinnati Retiree Health Benefits. Report Prepared as of December 31, 2012 and Approved by the Board of Trustees on May 2, 2013.

²³ A similar point is made in Munnell, A.H., Aubry, J., Hurwitz, J., & Quinby, L. (2011, September). Compensation: State-Local Versus Private Sector Workers. *Center for Retirement Research at Boston College: State and Local Pension Plans*, 20.

contrast, a worker with a DC pension who sought a guaranteed return could receive only around 3.5 percent, by investing in riskless U.S. Treasury securities. This difference in effective returns is valuable to DB pension participants, but costly to a DB pension sponsor.

As discussed above, we can make DB and DC pension contributions comparable by converting the normal cost of the CRS plan to market value. Doing so produces a total normal cost of 37.2 percent of employee payroll, of which 28.2 percentage points are borne by the employer either through direct contributions or by bearing the risk of investment underperformance. Even if the employer DC pension contribution were the maximum of 9 percent of wages, the City would effectively save 19.2 percent of wages annually. These savings would initially be small in dollar terms, as only newly-hired employees would participate in DC pensions, but they would increase over time. By eliminating the accumulation of contingent pension liabilities, shifting to a DC plan would reduce the City's economic cost of providing pensions to its employees. At the same time, however, total effective compensation to City employees also would be reduced, as they would lose the value of receiving high effective guaranteed returns on their pension contributions.

Conclusion

Two sections of the Cincinnati pension Amendment would affect benefits paid under the defined benefit Cincinnati Retirement System. Reductions in the replacement factor used to calculate initial benefits would reduce the normal cost of accruing benefits by around one-third, generating savings for both the City and its employees. This would reduce City pension costs by approximately \$1 million per year. A 3 percent cap on annual Cost of Living Adjustments would reduce total benefit liabilities owed to most current retirees by roughly 5 percent, but would increase benefits for CRS participants who have yet to claim benefits. Thus, the effects of the COLA provisions on CRS financing and the City budget are ambiguous.

If CRS benefit liabilities were judged at fair market value, which most economists and independent government agencies have argued gives the fullest view of the economic costs of DB pension plans, savings to the City in the form of reduced contingent liabilities would be even larger. Fair market valuation accounts for the risk to the City budget if CRS investments fail to meet their assumed 7.5 percent return. Reducing benefit accruals under the CRS would produce immediate economic savings to the City of around \$19.7 million per year, although these savings would gradually fade as current CRS participants began to retire. Lower COLAs would reduce benefit liabilities owed to current retirees by around 5 percent, but have an offsetting increase in liabilities for most CRS participants who have yet to claim benefits. It is not possible given current information to estimate the net effect of the COLA provision of the Amendment.

For newly-hired City employees participation in DC pensions would be mandatory. Current employees would have the option to participate. City contributions to DC pensions could be no more than 9 percent of employee wages, an amount greater than the City's current contribution of 1.9 percent of pay toward the "normal cost" of accruing pension benefits. However, any comparison of the costs of DB versus DC pensions must account for the contingent liabilities associated with DB plans – that is, the City's obligation to pay benefits even if plan investments fail to generate their assumed returns. Using economists' standard approach

for valuing these contingent liabilities, the total economic cost to the City of new CRS DB pension benefits accruing to employees each year is around 28 percent of employee salaries, equal to about \$45 million per year. These costs would be reduced even if the City chose to make the maximum DC pension contribution of 9 percent of pay.

In sum, the largest savings to the City through the Amendment would not be in terms of direct pension contributions, but in reducing budgetary risk. Defined benefit pensions investing in risky assets impose significant contingent liabilities on plan sponsors to make good on benefit promises if pension investments fail to generate assumed returns. And the need for additional funds tends to occur in bad economic times, when the sponsor and taxpayers' ability to pay is at its lowest.

Passage of the Cincinnati Pension Reform Charter Amendment Initiative would lower overall pension costs for the City and reduce budget pressures in future years. The overall success of such policies, of course, also depends upon the successful implementation of the reforms mandated in the Amendment, in particular the design of an effective and low-cost DC plan for public employees. A well-designed DC pension plan – such as the Thrift Savings Plan offered to federal government employees – can serve as an effective retirement saving vehicle for public employees. Policymakers should consider many of the reforms made in DC pension design in recent years, such as the use of low-cost index funds, default participation in the pension plan, and so-called “life cycle” investment portfolios that automatically shift from bonds to stocks as workers near retirement.

About the Author

Andrew G. Biggs is a resident scholar at the American Enterprise Institute, where he studies Social Security reform, state and local government pensions, and public sector pay and benefits. In 2013, the Society of Actuaries appointed Biggs co-vice chair of a blue ribbon panel tasked with analyzing the causes of underfunding in public pension plans and how governments can securely fund plans in the future. Before joining AEI, Biggs was the principal deputy commissioner of the Social Security Administration, where he oversaw SSA's policy research efforts. He has published widely in academic publications as well as in daily newspapers such as The New York Times, The Wall Street Journal, and The Washington Post.

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By Andrew G. Biggs, Ph.D.

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