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ANDERSON ECONOMIC GROUP

Downstate Police and Fire Pension Funds in Illinois

The Impacts of Funding Reforms and Investment Returns on Fund Solvency

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I.Executive Summary

Unfunded pension liabilities are one of the greatest fiscal concerns for Illinois' state and local governments. This concern became more acute as unfunded pension liabilities grew in the face of declining asset values following the recent recession; however, there are many further factors. These factors include employers' funding levels, benefit changes, and misestimation of future demographics and payroll.

PURPOSE OF REPORT

The Illinois Public Policy Institute requested that Anderson Economic Group estimate the impact of various factors on police and fire pension funding levels in downstate Illinois. In this report, we look in particular at the past and projected future performance of downstate police and fire pension funds in Illinois under different employer funding requirements. We also benchmark the performance of fund investments by comparing investment returns across a sample of municipalities over the last 25 years to a benchmark index.

OVERVIEW OF APPROACH

We requested data directly from the Illinois Department of Insurance and a sample of municipalities in order to perform the analysis shown here. See "Appendix A. Our Sample of Municipalities" on page A-1 for a list of municipalities that were included in our sample.

We perform an analysis on investment returns across a subset of pension funds in these municipalities. For our investment returns analysis, we use a benchmark index that consists of the S&P 500 index as a benchmark for investments in equities, and U.S. 10-year treasury bonds as a benchmark for investments in bonds, and assume that funds took the maximum investment risk that the law would allow.

The results presented here are estimates. For future projections of pension fund contributions and funding ratios, we assume that actuarial assumptions regarding investment returns, life span, payroll, and other factors will be accurate. For backward-looking analyses where we analyze fund performance given different employer contributions, we assume that market returns, employee contributions, and normal costs would have been the same in each scenario.

OVERVIEW OF FINDINGS

Our research and analysis resulted in the following findings:

1. *Changes in employer funding requirements in Illinois since 1993 have generally resulted in employers contributing less in the short term. These lower contributions have resulted in lower funding levels and higher unfunded liabilities.*

We performed two separate analyses—one on the City of Springfield since 1990 and the other on a broad sample of municipalities since 2003. Both analyses showed that each significant legal change to funding requirements for police and fire pension funds since 1990 has resulted in significantly lower employer contributions in the short term. As a result, funding levels are much lower than they would otherwise be without these funding requirement changes. See "The Impact of Changes to Funding Requirements" on page 11.

2. *If municipalities had been required to fund police and fire pension funds at a level dollar amount with a rolling 30-year amortization period, they would have contributed at least $650 million more from 2003 to 2012 and their average funding ratio would be approximately 13 percentage points higher (73% instead of 60%), on average.*

To illustrate the impact that different funding requirements could have had on unfunded liabilities, we estimated the amount that a sample of municipalities in Illinois would have contributed to their pension funds, starting in 2002, if they had been required to pay down their unfunded liability using a 30-year rolling amortization period. We found that, on average, the municipalities in our sample would have had a funding ratio of 73% by the year 2012, as opposed to the 60% ratio that they actually had. They would have achieved this by contributing, on average, $65 million more per year—a 60% increase. See "Performance Since 2002 Under Different Funding Requirements" on page 15.

3. *Not all municipalities complied with existing employer funding requirements. Half of the increase in funding ratio described in the previous finding would have occurred if municipalities had strictly complied with the funding requirements that were already in effect during this time period.*

From 1993 to 2010, state law required municipalities to fund police and fire pension funds using a level payroll percentage amortization method to reach full funding by the year 2033.[1] There was no mechanism for enforcing these requirements, however, and many municipalities did not make the required contributions. In addition, some municipalities used legal methods such as smoothing of asset values or revaluation of assets that resulted in lower employer contributions. We found that, if all the municipalities in our sample had strictly made legally required employer contributions starting in 2002, their average funding ratio would have been 67% in the year 2012, as opposed to 60%.

1. See "Three Prominent Features of Funding Requirements" on page 8 for a definition of some of the terms used here.

4. *Poor management of investments does not appear to contribute to police and fire pension shortfalls in Illinois. From 1990 to 2013, police and fire pension funds outperformed investment returns of a benchmark index, on average.*

We found that police and fire pension funds in a sample of municipalities in Illinois had average annual investment returns of 6.9% over the period from 1990 to 2013. We constructed a "benchmark index" that included the types of assets in which pension funds were allowed to invest, and found a 6.6% average annual investment return over the same time period for that index. This suggests that, on average, downstate police and fire pension funds outperformed expectations, based on overall market performance.

Despite outperforming the market, on average, many municipalities still had returns below the long-term return on investment assumed by actuaries, which was as high as 7.5% in some cases. See "Public Pension Investment Performance" on page 20.

5. *Under current policy, municipalities in our sample will be required to pay just over $100 million a year in the coming year to cover their unfunded liabilities, increasing to $300 million a year by the year 2040, after which the plans will only be 90% funded.*

We projected unfunded liability payments for all of the police and fire pension funds for the municipalities in our sample. We project that, under the current funding requirement, these municipalities will need to contribute just over $100 million combined per year toward their unfunded liability each of the next few years. This amount will increase to nearly $300 million by the year 2040.

In the year 2040, the pension funds will still be only 90% funded, so municipalities will need to continue making unfunded liability payments after 2040. In fiscal year 2012, actual contributions that went toward unfunded liabilities for municipalities in our sample totaled $77 million. See "Projected Performance Under Different Funding Requirements" on page 17.

6. *Starting in 2013, if municipalities were required to fully fund police and fire pension funds using a 30-year rolling amortization period, the municipalities in our sample would pay $170 million a year for unfunded liabilities, in total, declining to about $130 million by the year 2040.*

We projected unfunded liability payments under an alternate funding scenario, where police and fire pension funds would be required to pay down unfunded liabilities using a level-dollar, 30-year rolling amortization period. Total employer contributions for our sample in this alternate scenario would start at

around $170 million a year, declining by about 1% a year after that. By the year 2040, the funds in our sample would be 92% funded, on average.

ABOUT ANDERSON ECONOMIC GROUP

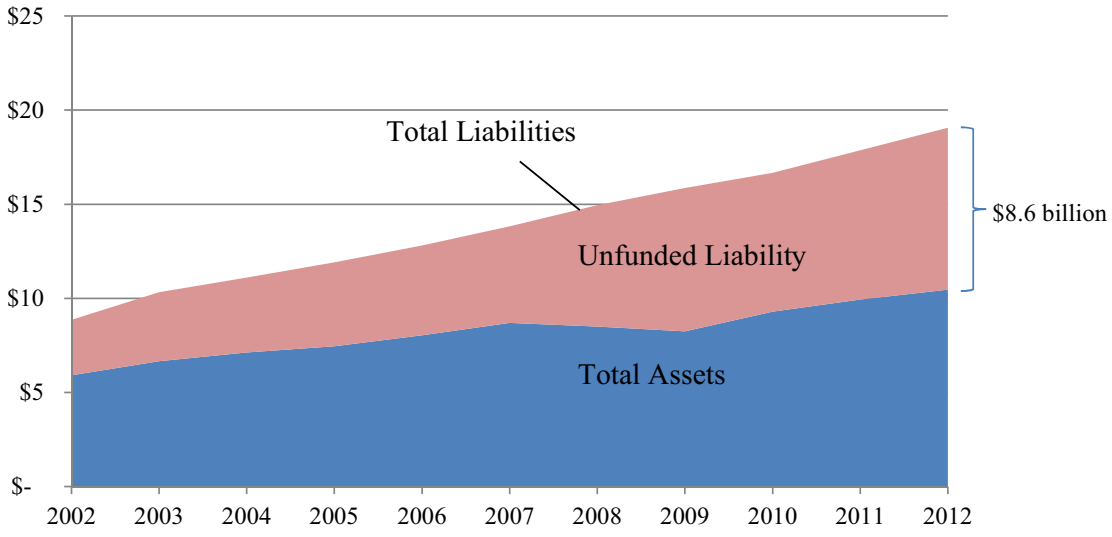
Anderson Economic Group, LLC is a research and consulting firm specializing in economics, public policy, finance and business valuation, and market and industry analysis. The firm has offices in Chicago, Illinois, and East Lansing, Michigan. AEG has conducted studies on the impacts of public policy for private, public, and non-profit clients across the United States. For more information about the firm and the authors of this report, see "Appendix C. About AEG" on page C-1.

II. Police and Fire Pension Funds in Illinois

According to the Illinois Commission on Government Forecasting and Accountability (COGFA), there were 642 police and firefighter pension funds in Illinois outside the City of Chicago in the year 2013. Throughout this memorandum, we will focus on these "downstate funds" exclusively. Pension funds are used to pay defined-benefit pensions, as well as other benefits, to retired police and firefighters. State law dictates the nature of these benefits and how cities, towns, and villages are to prefund them.

According to data provided by the Illinois Department of Insurance, the total assets of these funds were $10.5 billion at the end of the 2012 fiscal year. Total accrued liabilities in that same year were $19.1 billion, resulting in a total unfunded liability of $8.6 billion.[2] Figure 1 below shows how total assets compare to liabilities in these funds from the year 2002 to 2012.

FIGURE 1. Total Downstate Police and Fire Pension Funds Assets and Liabilities, FY 2002 to FY 2012 (billions of $)



Source: Illinois Department of Insurance Public Pension Reports

It is clear that these pension funds, in total, have been underfunded for some time. In 2002, the funding ratio (assets divided by liabilities) in these funds was only 67%. The situation worsened considerably in 2009, when the market value of assets in these funds dropped due to the recession. By the end of fiscal year

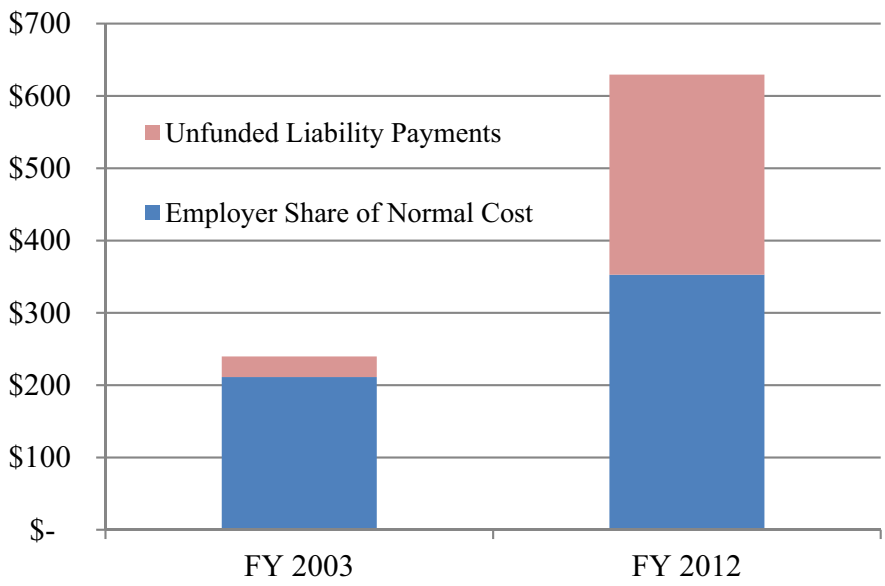
2. Total accrued liabilities are the present value of all anticipated benefit payments for service time accrued by retirees and current employees. It is considered good practice to fully cover these anticipated benefit payments with assets set aside to match the liabilities as they grow.

2009, the funding ratio was 52%. It increased only slightly—to 55%—by the end of fiscal year 2012.

In order to ensure that enough money is set aside to pay benefits, governments have to play catch-up when there is an unfunded liability. In addition to the "normal costs" that they set aside for current employees for their future benefits, they must set aside additional money to pay for benefits that have already been accrued but are not fully funded.

Employer payments (payments by local governments) into all downstate police and fire pension funds totaled $629 million in fiscal year 2012, up nearly three-fold from $240 million in 2003. Only $352 million of those employer contributions were for normal costs to cover newly accrued benefits for current employees. The remainder—nearly half of the employer contributions in 2012—were made to pay down the unfunded liability. See Figure 2 below, which compares the employer share of normal costs and unfunded liability payments in FY 2003 and FY 2012.

FIGURE 2. Total Employer Payments in Illinois Downstate Police and Fire Pension Funds, FY 2003 and FY 2012 (millions of $)



Source: Illinois Department of Insurance Public Pension Reports

There are several explanations for the funds' current position, all of which have at least some effect. They include unexpected changes in employee benefits, salaries, and demographics; fluctuations in market returns; changes in funding requirements; and varying compliance with those requirements. In this report,

we focus on two factors, in particular, and their effect on downstate pension funds. These factors are:

- Funding requirements and compliance
- Investment returns

You can find the results of our analysis in the following chapters.

III. Funding Requirements for Police and Fire Pension Funds in Illinois

In defined-benefit pension funds, employers (in this case, local governments) set aside money to pay future retiree benefits. They invest that money in an attempt to get long-term returns. Finally, they pay a defined set of benefits to retirees as those retirees become eligible.

There are two significant advantages to *pre-funding* retiree benefits through a pension fund. Firstly, this practice allows employers to recognize the total benefits and costs of an employees' services in the same period. If retiree benefits are not pre-funded, an employer can find itself paying for services thirty or forty years after they were provided.

Secondly, pre-funding allows an employer to take advantage of long-term investment returns on money set aside for retiree benefits. For example, if an employer can reasonably expect 8% annual returns on investment, instead of paying a retiree $100 ten years from now, it can instead set aside and invest $46 today. As a general rule, the earlier money is set aside to pay for retiree benefits, the less total money needs to be set aside overall.

THREE PROMINENT FEATURES OF FUNDING REQUIREMENTS

When accrued liabilities exceed assets in a pension fund, it results in an unfunded liability. In order to ensure that benefits can be paid in the future, employers come up with various ways to cover these unfunded liabilities when they arise. In this memorandum, we will focus on three parameters that determine how employers pay down unfunded liabilities, in particular.

Amortization period. The amortization period dictates how long you can take to pay down an unfunded liability. Generally, the longer the amortization period, the less an employer has to pay in any given year. However, an employer will generally end up paying more in total over time if the amortization period is longer because the investment returns will be lower.

Level dollar vs. level percentage of payroll amortization. Under a level dollar amortization method, the employer is required to make a contribution such that if the employer were to make that same contribution in each year throughout the amortization period, the unfunded liability would be fully paid. Under a level percentage of payroll amortization, the employer is required to make a contribution such that if the employer were to contribute *the same share of payroll* in each year throughout the amortization period, the unfunded liability would be fully paid. Since employers and actuaries tend to assume that payroll will increase in the future, this latter method allows an employer to pay less in the immediate future but more in the long term, as payroll is projected to grow.

Smoothing of investment returns. Investment returns, particularly for funds invested in equities, are volatile. As a result, an unfunded liability can fluctuate greatly from year to year if it is based on the fair market value of assets. In order to provide some stability to contributions, employers will often recognize investment returns—both losses and gains—over an extended period of time. If there is a large drop in the market, the employer will only recognize a portion of those losses in each year following the drop. By the time the full drop is recognized, it may very well be the case that it has been offset by a market rebound. A common smoothing period is five years.

FUNDING REQUIREMENTS IN ILLINOIS

Prior to January 25, 1993, the Illinois Pension Code required plan sponsors for downstate police and fire pension funds to provide an annual contribution to pension funds that ensured that they would be fully funded within a 40-year period. For fire funds, the Illinois Pension Code specifically indicated that the amortization payment for the unfunded liability be calculated on a level dollar basis. The initial date for the 40-year amortization period was January 1, 1980 for all fire funds. The initial date for police funds was either January 1, 1980 for funds in existence prior to that date or the date of establishment for funds created afterward. Thus, for almost all funds, unfunded liabilities were required to be paid in full by the year 2020.

1993 Reforms

Public Act 87-1265 (PA 87-1265) included two major reforms to the funding requirements for downstate police and fire pension funds. It required that the annual contribution be determined using the level percentage of payroll amortization method, and changed the initial date of the amortization period to July 1, 1993. As a result, rather than needing to fully fund plans by the year 2020, governments were now required to fully fund plans by the year 2033. This reform did not include any enforcement mechanism to ensure that municipalities were compliant with these funding requirements.

2010 Reforms

The funding requirements for police and fire pension funds essentially remained unchanged from 1993 to 2010, when PA 96-1495 was passed. PA 96-1495 required municipalities to levy a tax on taxable property at a rate that generates revenue equal to the normal cost of the fund plus an annual amount sufficient to reach 90% funding levels in pension funds by fiscal year 2040. The minimum required contribution for the unfunded liability is to be calculated as a level percent of payroll over the years remaining, up to and including FY 2040.[3]

3. This reform also included significant revisions to the way that the City of Chicago funds pensions, which are not described here.

The reform also set requirements for determining the actuarial value of assets. Prior to March 30, 2011, the actuarial value of assets for most municipalities was equal to the market value of assets, and there was no provision regarding the smoothing of investment returns. After March 30, 2011, the state required that investment returns be recognized in equal amounts over 5 years.

Finally, the 2010 reforms put into effect an enforcement mechanism for the first time. If any municipality failed to meet its contribution requirements, then the state government would deduct and deposit into the pension fund the amounts owed (or a portion of the amount owed) from state grant funds that would have otherwise gone to the municipality. This enforcement mechanism does not kick in until FY 2016.[4]

4. The proportion of state grant funds subject to this provision will increase according to the following schedule:

   In FY 2016, one-third of the total amount of any state grant funds to the municipality;

   In FY 2017, two-thirds of the total amount of any state grant funds to the municipality; and

   In FY 2018 and each fiscal year thereafter, the total amount of any state grant funds to the municipality.

IV. The Impact of Changes to Funding Requirements

In order to investigate the effect of legal changes to employer funding requirements, we took several approaches. First, we looked at one municipality, Springfield, for which there was abundant data all the way back to 1990. We constructed a model that estimated what the employer contributions would have been in each year, and what the resulting funding ratio would have been, if the 1993 funding reforms had not occurred. We also estimated what the employer contributions and corresponding funding ratio would have been under an alternate funding policy.

Next, we looked at hypothetical scenarios for a large sample of cities, towns, and villages, if different policies had been in effect since 2003. Three different scenarios correspond to the three different funding requirement schemes that have been in place in Illinois over the past 25 years. The fourth is an alternate scenario of our own creation. Under each scenario we consider both the funding ratio and the employer contributions over time. We outline all of the different scenarios in Table 1 below.

TABLE 1. Funding Requirements in Illinois for Downstate Police and Fire Pension Funds

Time Period	Amortization Period	Level Dollar or Level Percentage of Payroll	Investment Return Smoothing
Pre-1993	Fully funded by 2020	Level dollar	None
1993 to 2010	Fully funded by 2033	Level percentage of payroll	None
Post-2010	90% funded by 2040	Level percentage of payroll	5-year smoothing
Alternate scenario (AEG)	Rolling 30-year amortization	Level dollar	5-year smoothing

Source: Illinois General Assembly Public Acts

The Alternate Scenario. We will show in the upcoming analysis that funding requirement changes over time have largely allowed employer contributions to be lowered in the short term but increased in the long term. We compare these requirements to an alternate set of requirements, that would entail a rolling 30-year amortization period, a level dollar amortization method, and 5-year smoothing of investment returns. We crafted this scenario by considering the following factors:

- Full funding should be the goal of any amortization scheme because any unfunded liability has the same effect as high-interest debt—over the medium

and long term, it will result in a significant fiscal burden. However, when the deadline for full funding is set to an arbitrary year, municipalities are at risk of being forced to put an unreasonable amount into the fund as the arbitrary deadline approaches. Rolling amortization requires that a municipality set aside enough for long-term full funding, but avoids the risk of approaching the deadline during a market downturn.

- The level percent of payroll amortization method is a reasonable one if an employer is confident that payroll will in fact increase at the assumed rate. However, payrolls for governments across Illinois have been relatively flat, and we see no reason to assume that will significantly change in the near future. A level dollar amortization method is more in line with that expectation and will prevent municipalities from constantly chasing higher and higher contributions.
- Markets are volatile. Sharp changes in unfunded liabilities can lead to significant fiscal burdens. Smoothing of investment returns results in more predictable contributions. As long as smoothing is not selectively applied, it stabilizes municipal expenditures and ensures pension funds receive contributions through booms and busts alike.

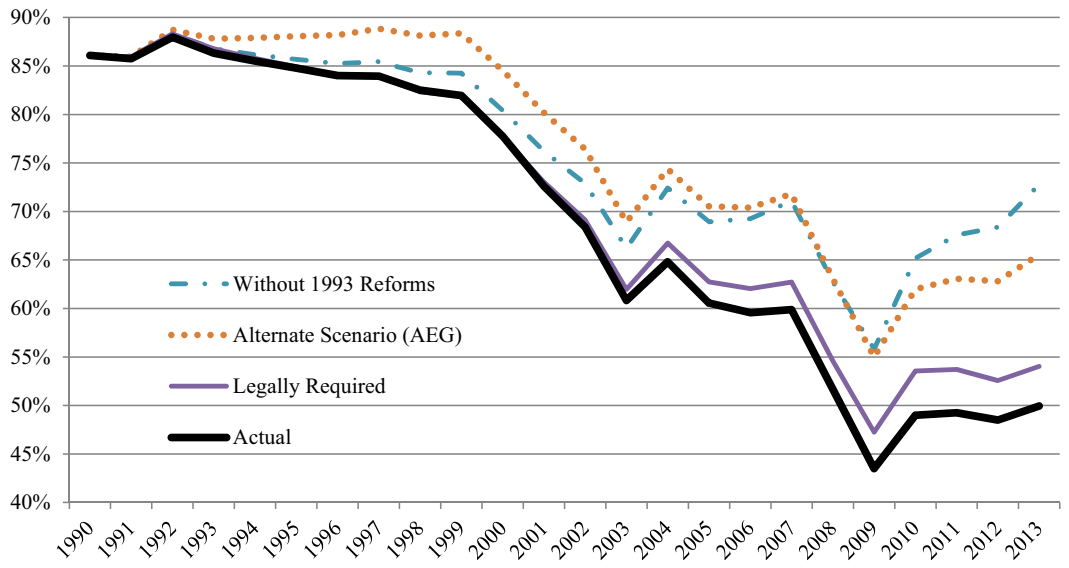
FUNDING REQUIREMENT CHANGES SINCE 1990

First, we consider what the police and fire pension funds for the City of Springfield would have looked like if the reforms outlined in "Funding Requirements in Illinois" on page 9 had not taken place. We chose the City of Springfield for this analysis since it had the most information available of all the municipalities in our sample going back to 1990. Also, it is a good test case because it has contributed the actuarially required amount to its pension in each year since 1990. That allows us to be sure that historical variations in funding are not due to the city failing to comply with funding requirements.

Figure 3 and Figure 4 on page 13 show the funding ratio and employer contribution requirements, respectively, under several different scenarios. The thick bottom line in each figure represents the actual funding ratio and contributions over time. The slightly thinner purple line above it is the "legally required" amount, which is the amount Springfield would have contributed if it followed the letter of the law and no more. The dashed line corresponds to the funding ratio over time if the 1993 reforms had not gone into effect. Finally, the dotted orange line corresponds to what would have occurred if the alternate scenario we describe above had been in effect starting in 1990.

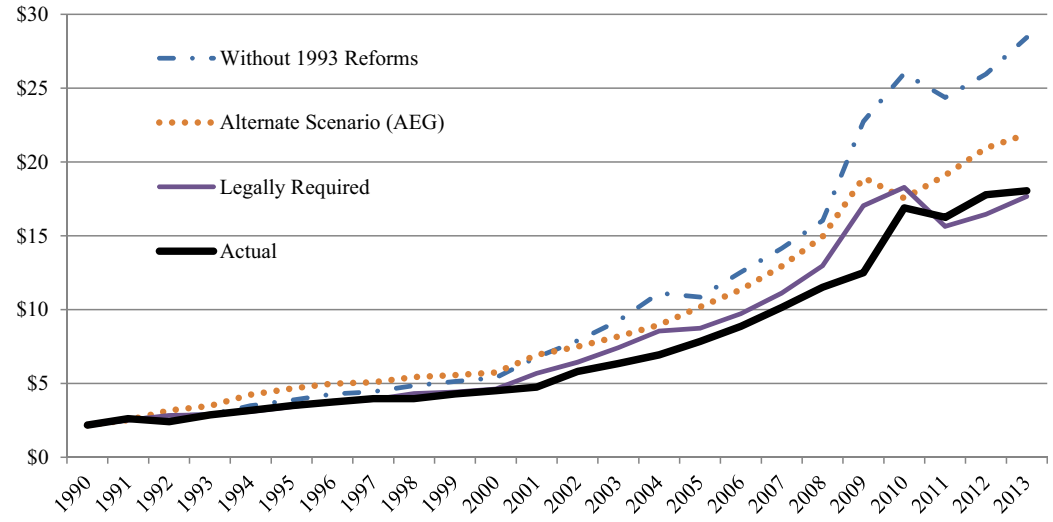
As mentioned above, Springfield contributed its actuarially required amount every year. Deviations only arise between the "Actual" and "Legally Required" lines in the graph because, after market losses in the early 2000's, actuaries for this city began to smooth investment returns, which was neither required nor prohibited by the law.

FIGURE 3. Funding Ratio for Police and Fire Pension Funds, City of Springfield; Actual Funding Compared to Legal and Hypothetical Funding Requirements



Source: AEG Estimates based on source data from Springfield Police and Fire Pension Fund Financial Statements, Actuarial Reports

FIGURE 4. Employer Contributions for Police and Fire Pension Funds, City of Springfield; Actual Funding Compared to Legal and Hypothetical Funding Requirements (millions of $)



Source: AEG Estimates based on source data from Springfield Police and Fire Pension Fund Financial Statements, Actuarial Reports

If the 1993 reforms had not gone into effect, the funding ratio for these funds would be over 70% today, as opposed to 50%, where it currently stands. Of course, this would be because the city would have been contributing much more into the funds. In 2003, the city would have contributed $9.2 million to police and fire pensions, rather than the $6.4 million that it actually contributed. In recent years, after large market losses and as the 2020 end to the former amortization period approached, the city would have contributed considerably more. The cost would have been $9 million higher ($26 million compared to $17 million) in 2010 and $10 million higher ($28 million compared to $18 million) in 2013.

The alternate scenario results in a higher funding ratio than the current legal requirements, but without the same level of increase in recent years as would have occurred without the 1993 reforms. Since it incorporates investment return smoothing early on, in the boom years of the 1990's, under the alternate scenario Springfield would have been required to make higher payments than the other scenarios. In more recent years, contributions under the alternate scenario would have gone up steadily in response to investment losses, but not drastically, since the amount contributed is enough to fully fund the plan within 30 years. If the alternate scenario had been in effect since 1990, Springfield's pension funds would be 66% funded today. The city would have been required to pay up to $2.5 million more annually through the year 2006. Over the past 3 years, the alternate scenario would have required $3 to $4 million more in annual contributions than were actually contributed. Some of these numbers are summarized in Table 2 below.

TABLE 2. Funding Ratio and Annual Employer Contributions Under Different Scenarios for the City of Springfield (millions of $)

	1993		2003		2013		
Funding Requirements Scenario	**Funding Ratio**	**Employer Contribution**	**Funding Ratio**	**Employer Contribution**	**Funding Ratio**	**Employer Contribution**	**Total Contributions 1990-2013**
Actual Contributions	86%	$2.9	61%	$6.4	50%	$18.1	$181.0
Legally Required	87%	$2.9	62%	$7.4	54%	$17.7	$193.8
If 1993 Reforms Had Not Occurred	87%	$2.9	66%	$9.2	73%	$28.4	$258.0
Alternate Scenario	88%	$3.5	69%	$8.2	66%	$21.9	$226.5

Source: AEG Estimates based on source data from Springfield Police and Fire Pension Fund Financial Statements, Actuarial Reports

In sum, if the 1993 reforms had not occurred, the funding ratio for police and fire pension funds in Springfield would be 23 percentage points higher, and payments for recent years would be $10 million higher annually. Under an alternate hypothetical scenario where smoothing and rolling, level-dollar amortization were in effect since 1990, the funding ratio would be 16 percentage points

higher and recent payments would be $3 or $4 million a year higher than they have been.

It is worth noting that under current funding requirements, the employer contributions are determined using a level percentage of payroll method so, by design, they will increase considerably each year. Under the alternate scenario and the scenario where the 1993 reforms had not occurred, payments would remain flat barring any unforeseen change in the funds' unfunded liability.

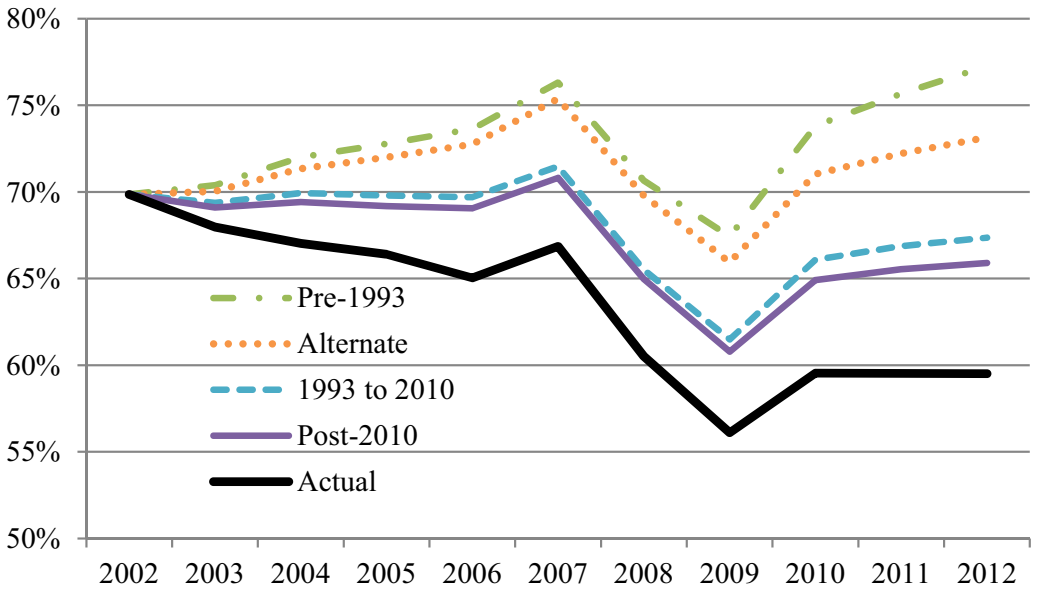
PERFORMANCE SINCE 2002 UNDER DIFFERENT FUNDING REQUIREMENTS

The City of Springfield is an instructive example, but it is just one city. We performed a different analysis on a large sample of cities, towns, and villages in order to see whether these effects are broad-based. In our analysis, we calculated what the employer contributions and funding ratio would have been in each year since 2002 if each of the four policy regimes outlined in Table 1 on page 11 had been in effect for all municipalities in our sample. The results are presented in Figure 5 and Figure 6 on page 16.

Firstly, note that the actual funding ratio is well below that of the funding ratio if the "1993 to 2010" funding requirements had been followed, even though the "1993 to 2010" funding requirements *were in effect* for all but two of the years shown. That suggests that municipalities in our sample were, on average, not putting the required amount of funds into their pensions. If they were, in the year 2010, the average funding ratio would have been approximately 66%, as opposed to 59%. The figure showing employer contributions shows that the "1993 to 2010" funding requirements should have resulted in contributions of approximately $35 million more per year, in total, for each year from 2003 to 2010.

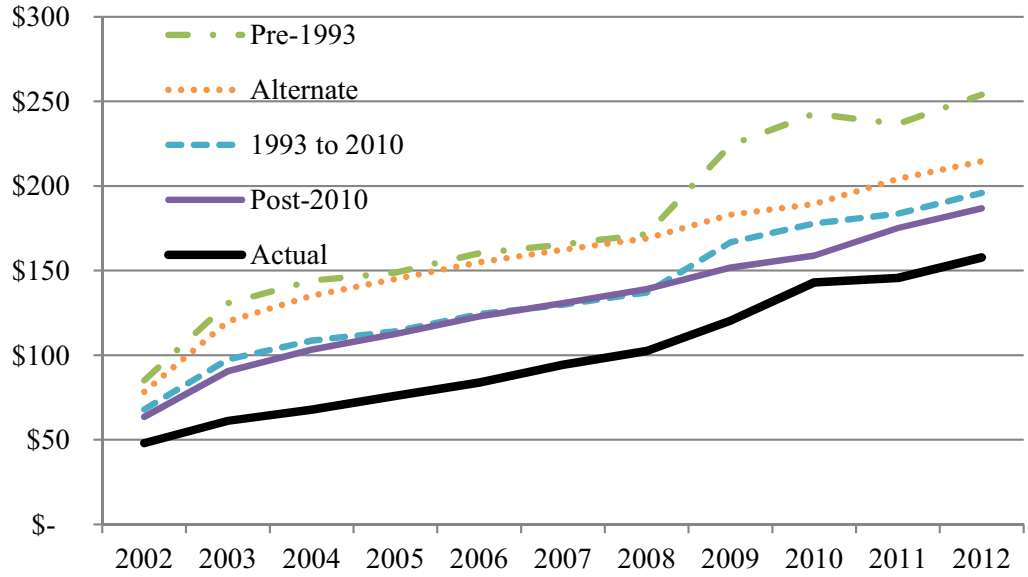
There are several explanations for this discrepancy between the actual funding levels and those that would have occurred if strictly following funding requirements from 2002 to 2010. In some cases, municipalities may have determined their contribution by using asset smoothing, which would reduce their contribution when market returns are lower than expected. Asset smoothing was not required but also was not prohibited at the time. Also, there may have been changes to the way that assets were valued in individual municipalities, which can impact contributions over time. However, the most likely explanation for so large a discrepancy across our sample is that many municipalities were simply not contributing the actuarially required amount to their police and fire pension funds throughout this period.

FIGURE 5. Average Funding Ratio Under Different Funding Requirement Scenarios for a Sample of Illinois Municipalities, FY 2002 to FY 2012



Source: AEG Estimates based on source data from Illinois Department of Insurance Public Pension Reports

FIGURE 6. Total Employer Contributions Under Different Funding Requirement Scenarios for a Sample of Illinois Municipalities, FY 2002 to FY 2012 (millions of $)



Source: AEG Estimates based on source data from Illinois Department of Insurance Public Pension Reports

Under the alternate funding requirements, annual employer contributions would have been approximately $60 to $70 million higher every year than actual annual contributions, in total, for our entire sample. This would have resulted in an average funding ratio of 73% in 2012, as opposed to the actual average funding ratio of 60%.

In sum, reforms to funding requirements over time have made it so that municipalities were required to contribute less and less to their police and fire pension funds, and the result, in combination with noncompliance, has been a significantly lower funding ratio. If the current ("Post-2010") regime had been in place since 2002, funding ratios would be 66%, on average. If the previous regime had been strictly followed ("1993 to 2010") since 2002, funding ratios would be 68%, on average, and if the regime before that had been strictly followed since 2002, funding ratios would be 78%, on average. In each case, the difference would be due to higher employer contributions. Note that, in any case, municipalities' actual contributions since 2002 in our sample have been considerably lower than any funding requirements during that period. We summarize some of these results in Table 3 below.

TABLE 3. Average Funding Ratio and Total Annual Employer Contributions Under Different Scenarios for a Sample of Illinois Municipalities (millions of $)

	2003		2008		2012		
Funding Requirements Scenario	Funding Ratio	Employer Contribution	Funding Ratio	Employer Contribution	Funding Ratio	Employer Contribution	Total Contributions 2002-2012
Actual Contributions	70%	$61.2	61%	$102.4	60%	$157.8	$1,100.5
Post-2010	69%	$90.6	65%	$139.0	66%	$186.9	$1,435.4
1993 to 2010	69%	$97.5	66%	$137.1	67%	$195.9	$1,503.7
Pre-1993	70%	$130.8	71%	$171.6	77%	$254.0	$1,963.5
Alternate Scenario	70%	$120.0	70%	$169.0	73%	$214.6	$1,755.8

Source: AEG Estimates based on source data from Illinois Department of Insurance Public Pension Reports

PROJECTED PERFORMANCE UNDER DIFFERENT FUNDING REQUIREMENTS

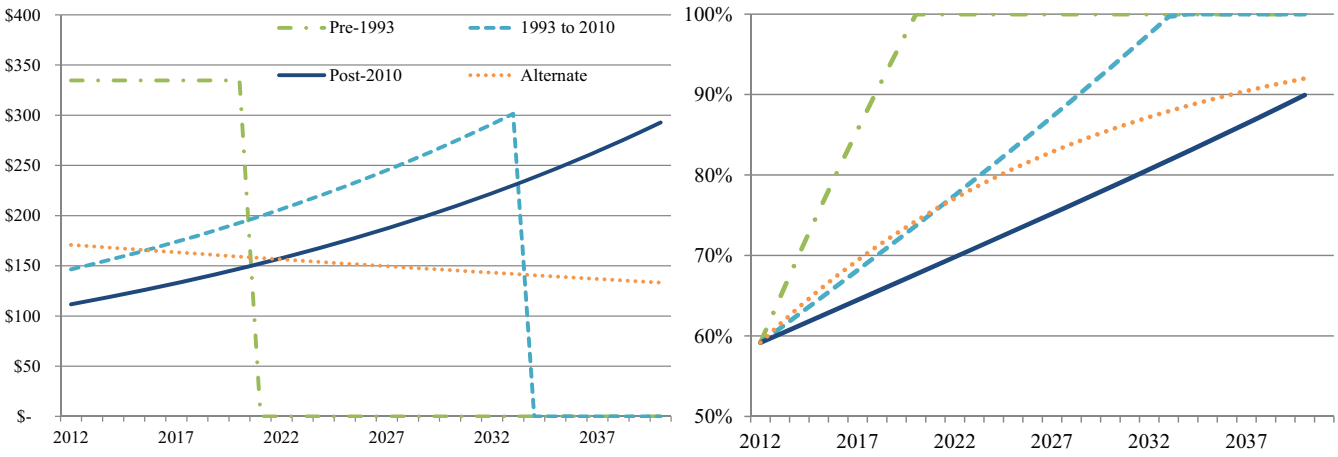
As shown in Figure 5 on page 16, the actual average funding ratio for municipalities in our sample was 60% in 2012. We performed an analysis where, given the current funding status of all of the municipalities in our sample, we estimated how the future will look under different funding requirement scenarios. Figure 7 on page 18 shows the projected annual unfunded liability payments (normal costs are excluded) and the corresponding funding ratio under the four different funding requirement scenarios, respectively. Note that the "Post-2010" scenario represents the current requirements. In each case, we have assumed that actuarial assumptions about employee and retiree demographics, payroll, and investment returns will turn out to be accurate.

In Figure 7 below, the contrast between level dollar amortization and level percentage of payroll amortization is clear. Under the alternate scenario, which includes level dollar amortization and a rolling amortization period, employer contributions are projected to start at a level of about $170 million and slowly decline—by about 1% a year—through the year 2040 and beyond.

On the other hand, the current "Post-2010" funding requirements demand an unfunded liability payment of just over $100 million annually right now. That amount is expected to increase to nearly $300 million per year by 2040. Under the "Post-2010" funding requirements, by the year 2040, the funding ratio is projected to remain at 90%. Under a rolling amortization scenario (the alternate scenario), the period is extended each year, so the funding ratio approaches full funding in the long-term but does not reach it by the year 2040.

These graphs also make clear that the pre-1993 requirement that pension funds reach full funding by the year 2020 is likely too difficult of a fiscal burden for municipalities. It would require a payment of well over $300 million annually toward the unfunded liability, which is over $200 million higher than that required by current policy ("Post-2010").

FIGURE 7. Projected Employer Contributions for Unfunded Liability and Funding Ratios Under Different Funding Requirement Scenarios for a Sample of Illinois Municipalities, FY 2012 to FY 2040 (millions of $)



Source: AEG Projections based on source data from Illinois Department of Insurance Public Pension Reports

V. Investment Returns and Fund Performance

The considerable drop in asset values that accompanied the recent recession was very consequential for pension funds all over the country, resulting in a significant increase in unfunded liabilities and, correspondingly, employer contributions. In this section, we compare investment performance by many of the police and fire pension funds in our sample to a benchmark index to evaluate whether they performed better or worse than expected given the legal constraints on pension fund investment.

ILLINOIS LAW ON PUBLIC PENSION INVESTMENTS

The Illinois Pension Code restricts the types of investments that can be held as assets by public pension funds. These restrictions are based primarily on the riskiness of the assets. Funds with larger portfolios under their control are permitted to invest in more diverse sets of assets, with different restrictions for pension funds at increments of $2.5 million, $5 million and $10 million.

Permissible investments for all pension funds include the following:

- Government bonds backed by the United States, the State of Illinois, Illinois local governments, and the State of Israel
- Interest bearing savings accounts and certificates of deposit insured by the federal government
- Pooled accounts managed by the Illinois Public Treasurer's Investment Pool (IPTIP)
- General accounts of Illinois life insurance companies
- Money market funds investing in US backed securities
- Short term debts of large corporations with investment grade ratings from at least two ratings agencies, so long as the fund does not hold over 10% of any one company's obligations

In addition, up to 10% of the pension fund's net assets can be held in separate accounts managed by life insurance companies, insurance company-managed real estate loans, or sizable, diversified and established mutual funds.

Most pension funds are permitted to invest in more risky assets to achieve greater returns. Funds valued over $2.5 million can invest up to 45% of their assets in mutual funds with diversified stock portfolios. Funds with asset values exceeding $5 million can invest 45% of their assets directly into stocks. Finally, funds with over $10 million in asset value can invest up to 65% of their assets in stocks. All of the pension funds in our sample have asset values exceeding $10 million.

Important Historical Legal Changes

The statutes regulating the investment activities of Illinois' downstate police and fire pension funds have been updated repeatedly over the last two decades. Prior to the passage of Public Act 90-507 in August of 1997, pension funds were not allowed to invest in equities of any kind.

Between 1997 and 2011, pension plans with under $2.5 million in assets were permitted to invest 10% in mutual funds, while pension plans with over $2.5 million in assets were permitted to invest 45% in mutual funds. In addition, pension plans with $5 million or more were permitted to invest 45% directly in stocks.

The requirements currently in place were phased in following the passage of Public Act 96-1495 in 2011. That law allowed pension funds with $10 million or more in assets to invest up to 60% in stocks in 2011, with that share increasing to 65% in 2012 and beyond.

PUBLIC PENSION INVESTMENT PERFORMANCE

We received data on pension fund investment returns since 1990 from ten municipalities, representing 17 police and fire pension funds. Each of the pension funds had over $10 million in assets. See Table A-1 on page A-1 for a list of municipalities in our analysis.

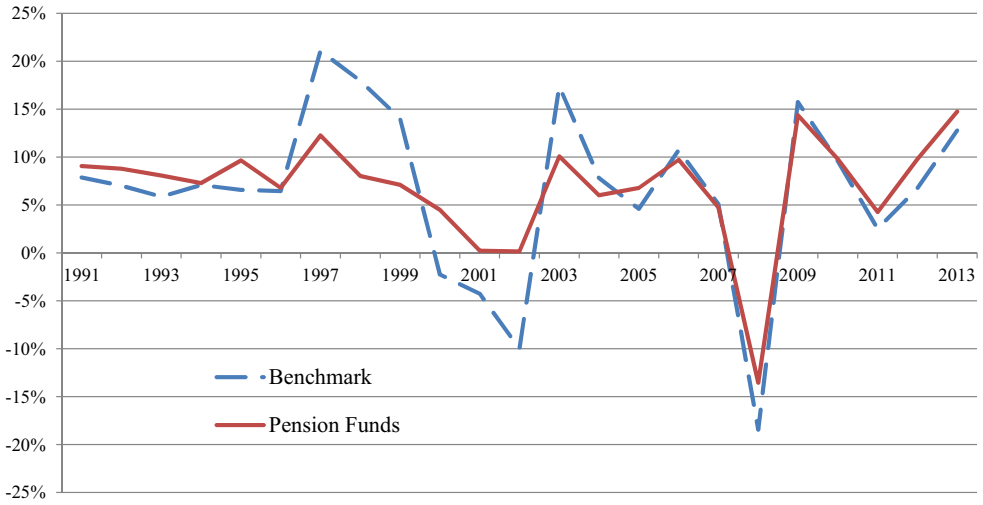
We created a "benchmark index" for the period from 1990 to 2013. As our benchmark for equities and bonds, we chose the S&P 500 index and 10-year United States Treasury bonds, respectively. We gave each a weight proportional to the statutory requirements then in force. For example, from the year 1997 to 2011, pension funds in our sample were able to invest up to 45% in equities. Therefore, our benchmark growth rate for those years was calculated by taking 45% of growth in the S&P 500 and adding 55% of growth in U.S. Treasury bonds.[5]

We show the average annual returns for our sample compared to the benchmark index in Figure 8 on page 21. Over the entire study period, investments by downstate funds in our sample outperformed the benchmark rate, earning average annual returns of 6.9% compared to the benchmark returns of 6.6%. This performance varied over time, with pension funds beating the benchmark by 1.5 percentage points for the period 1991 to 1996 and by 2.3 percentage points since the reforms of 2011. The pension funds in our sample underperformed by 0.6 percentage points for the period from 1997 to 2010.

5. Data on annual returns on investments in the S&P 500 and 10-year Treasury bonds is from: Aswath, Damodaran, "Annual Returns on Stock, T. Bonds and T. Bills: 1928-Current," *NYU Stern*, New York University, updated 1-5-14, accessed 12-16-14, http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histretSP.html.

While individual funds exhibited considerable short-term variation since 1990, on average the relationship between the benchmark and fund performance reflected changes in legal restrictions. Throughout the study period, public pension funds showed a more stable pattern than the market overall, with lower peaks and higher troughs than our benchmark index. The annual returns for our sample of pension funds had a standard deviation of 5.7%, compared with a 9.0% standard deviation for the benchmark rate. Most of the difference in variation appears to take place from 1997 to 2004, after pension funds were first permitted to invest in mutual funds and equities. They appear to have taken time to adjust their portfolios to these changes in regulatory restrictions.

FIGURE 8. Annual Rate of Return on Investments for Illinois Public Pensions and Benchmark Funds, 1991 to 2013



Sources: Federal Reserve System; New York University, Stern School of Business; The Cities of Aurora, Champaign, Chicago, Joliet, Naperville, O'Fallon, Springfield, and Wheaton, IL; The Villages of Deerfield and Grayslake, IL.
Analysis: Anderson Economic Group, LLC

Appendix A. Our Sample of Municipalities

We selected our sample of municipalities using the following method:

- First, we included every city with a population over 80,000 (nine total).
- Second, we selected five municipalities at random with populations between 50,000 and 80,000 (out of 18 total municipalities in that range).
- Finally, we selected ten municipalities at random with populations between 10,000 and 50,000 (out of 191 total municipalities in that range).

We used the following cities, towns, and villages in our sample for both analyses presented in this memorandum.

TABLE A-1. Cities, Towns, and Villages in Our Sample

Name	Designation	2010 Population
Aurora*	city	197,899
Rockford	city	152,871
Joliet*	city	147,433
Naperville*	city	141,853
Springfield*	city	116,250
Peoria	city	115,007
Elgin	city	108,188
Waukegan	city	89,078
Cicero	town	83,891
Champaign*	city	81,055
Evanston	city	74,486
Orland Park	village	56,767
Mount Prospect	village	54,167
Wheaton*	city	52,894
Plainfield	village	39,581
O'Fallon*	city	28,281
Grayslake*	village	20,957
Deerfield*	village	18,225
North Aurora	village	16,760
Country Club Hills	city	16,541
Morton	village	16,267
Washington	city	15,134
Midlothian	village	14,819
Herrin	city	12,501

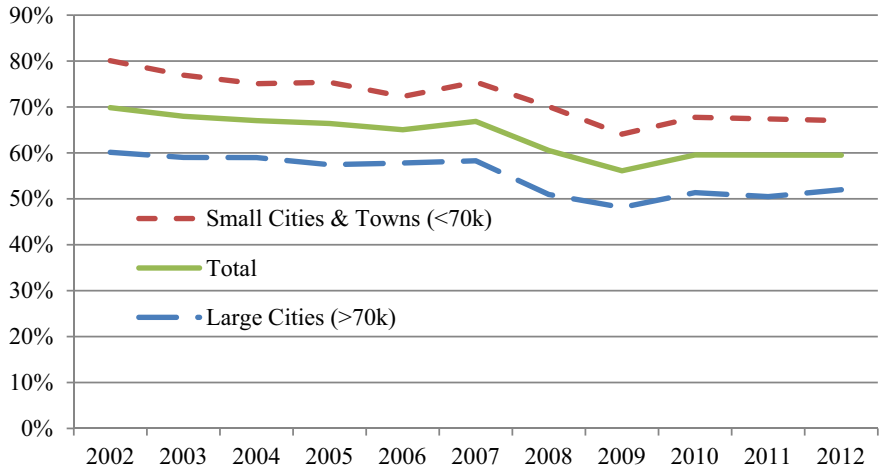
Source: U.S. Census Bureau
** Included in investment performance analysis*

Municipalities were chosen at random using a random number generator. Our goal was to include some of the largest municipalities in our sample, but also include a reasonable amount of municipalities across the population spectrum. Note that for the investment returns analysis, data was not available for some of the cities listed. For both analyses, we used information for both the police fund and the fire fund in each city, with the exception of the villages of Morton, O'Fallon, Orland Park, and Washington, where the firefighters receive retirement benefits from a larger protection district.

SUMMARY CHARACTERISTICS OF OUR SAMPLE

We show the average funding ratio for our sample in Figure A-1 below. This is an unweighted average of all funds in our sample. On average, funding ratios in our sample declined from approximately 70% in 2002 to 60% in 2012. Funding ratios throughout this time period were nearly 20 percentage points higher in small cities and towns, on average, than they were in large cities. (We define the cutoff between small cities and large cities at a population of 70,000.)

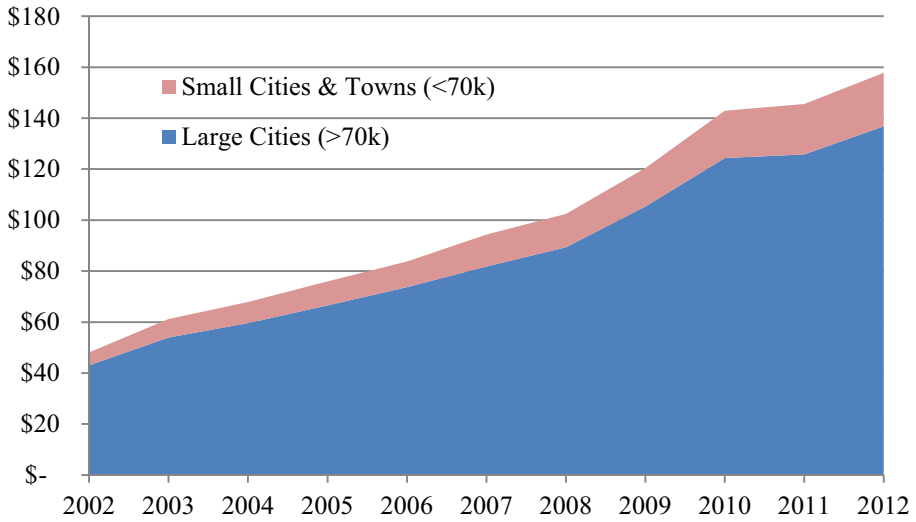
FIGURE A-1. Funding Ratio for Sample of Cities, Towns, and Villages, FY 2002 to FY 2012



Source: Illinois Department of Insurance Public Pension Reports
Analysis: Anderson Economic Group, LLC

Employer contributions have been increasing steadily since 2002 for municipalities in our sample. In 2002, total employer contributions were $48 million, with 11% of those employer contributions occurring in small cities and towns. By the year 2012, annual employer contributions for municipalities in our sample had risen to $158 million, with 13% in small cities and towns. See Figure A-2 on page A-3 for these trends.

FIGURE A-2. Total Employer Contributions for Sample of Cities, Towns, and Villages, FY 2002 to FY 2012 (millions of $)



Source: Illinois Department of Insurance Public Pension Reports
Analysis: Anderson Economic Group, LLC

Employer contributions for our sample represented 25% of total employer contributions for all downstate funds in FY 2012. Note that we've intentionally included all of the largest cities outside Chicago in our sample, and only a small share of the smaller ones. While they represent a small share of employer contributions in our sample, small cities and towns actually make up a majority of employer contributions to police and fire pension funds in the state, as a whole.

Throughout this report, we do not generally discuss police pension funds and fire pension funds separately, primarily because they exhibit similar trends. While funding ratios for police and fire pension funds, respectively, were four or five percentage points apart about ten years ago, they have recently converged to be within a percentage point, on average, across our sample. Also, in terms of employer contributions, approximately half of annual contributions go to police pension funds (53% in FY 2012), while the other half go to fire pension funds.

Appendix B. About AEG

Anderson Economic Group, LLC was founded in 1996 and today has offices in East Lansing, Michigan and Chicago, Illinois. AEG is a research and consulting firm that specializes in economics, public policy, financial valuation, and market research. AEG's past clients include:

- *Governments* such as the states of Michigan, North Carolina, and Wisconsin; the cities of Detroit, MI and Cincinnati and Sandusky, OH; counties such as Oakland County, Michigan, and Collier County, Florida; and authorities such as the Detroit-Wayne County Port Authority.
- *Corporations* such as Ford Motor Company, First Merit Bank, Lithia Motors, Spartan Stores, Nestle, and InBev USA; automobile dealers and dealership groups representing Toyota, Honda, Chrysler, Mercedes-Benz, General Motors, Kia, and other brands.
- *Nonprofit organizations* such as the convention and visitor bureaus of Lansing, Ann Arbor, Traverse City, and Detroit, as well as Experience Grand Rapids; higher education institutions including Michigan State University, Wayne State University, and University of Michigan; trade associations such as the Michigan Manufacturers Association, Service Employees International Union, Automation Alley, the Michigan Chamber of Commerce, and Business Leaders for Michigan.

Please visit www.AndersonEconomicGroup.com for more information.

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Prior to joining AEG, Mr. Horwitz was the Coordinator of Distribution for the Community Center of St. Bernard near New Orleans, where he oversaw the distribution of donated food, clothes, and household supplies to low-income residents of St. Bernard Parish and New Orleans' Lower Ninth Ward.

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Mr. Westlake holds B.A.s in both International Relations and Economics from Michigan State University and returned to MSU to earn his Master of Public Policy as well.