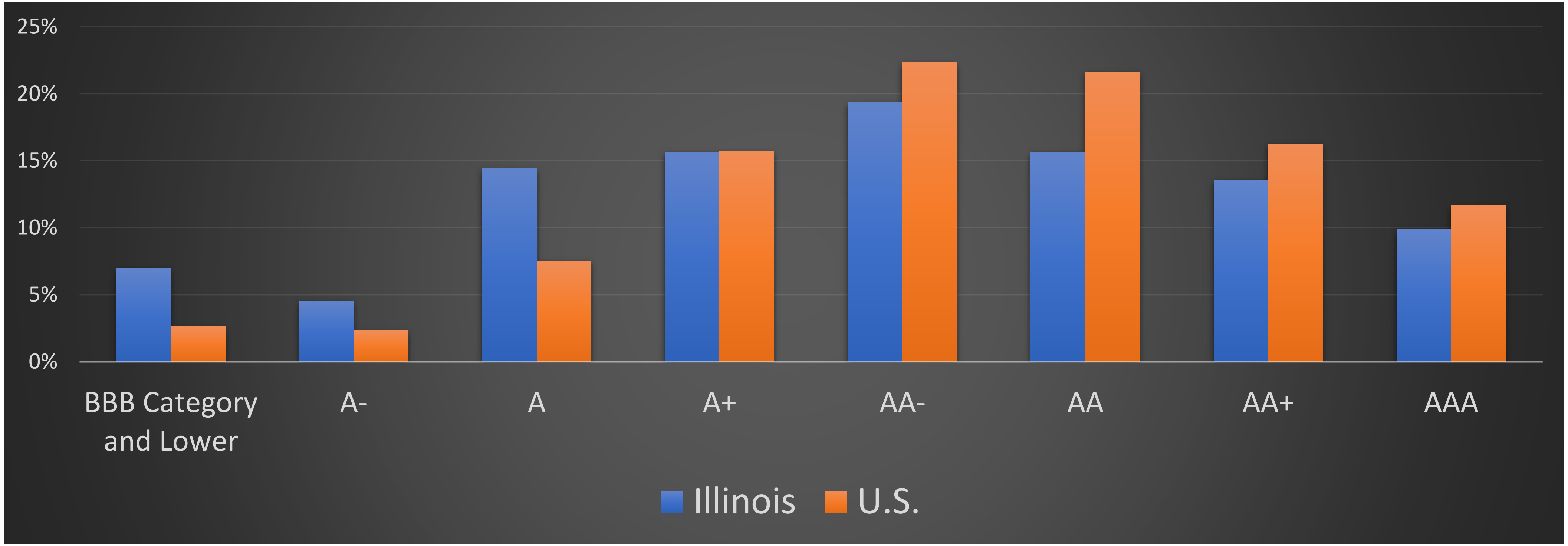
Credit & Market Impact of Pensions

Scott Nees
Associate Director
S&P Global Ratings

Andrew Kim
Director, Public Finance
PMA Securities, Inc.

Stephen Adams
Director, Public Finance
PMA Securities, Inc.

Illinois v. U.S. Municipal General Obligation Rating Distribution



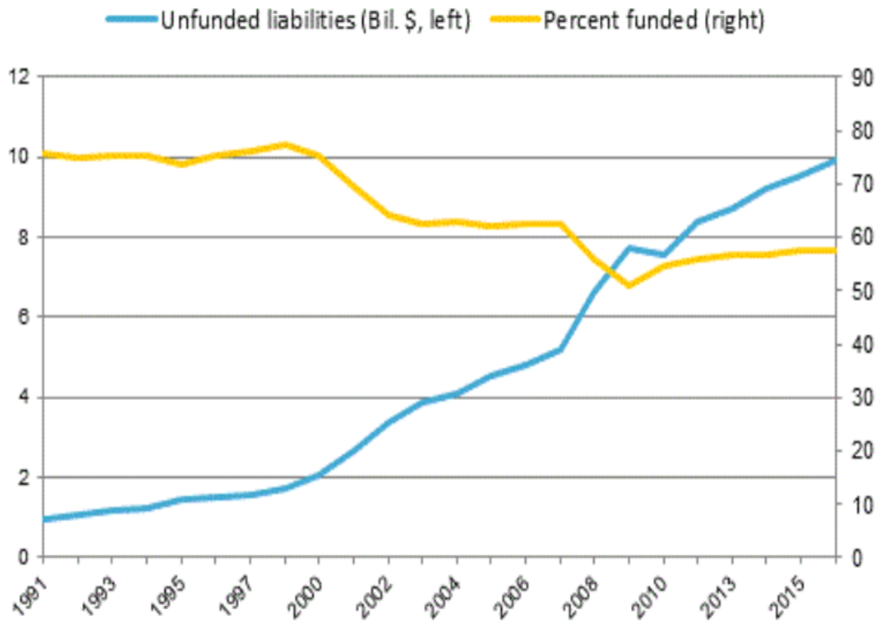
Pension Pressure Endemic for IL Munis

- According to data from the Illinois Department of Insurance (DOI), downstate and suburban unfunded liabilities have been on a steady upward trajectory and funded ratios on a downward trajectory for several decades

- In S&P's rating universe, the average downstate and suburban public safety pension plan is only 51% funded

Source: Pension Pressures Are Likely To Weigh On Illinois Municipal Credit Quality, February 22, 2018

Historical Funding Levels And Unfunded Liabilities For Downstate And Suburban Public Safety Plans



Source: Illinois General Assembly Commission on Government Forecasting and Accountability. Data not reported for fiscal 1998 and 2011.

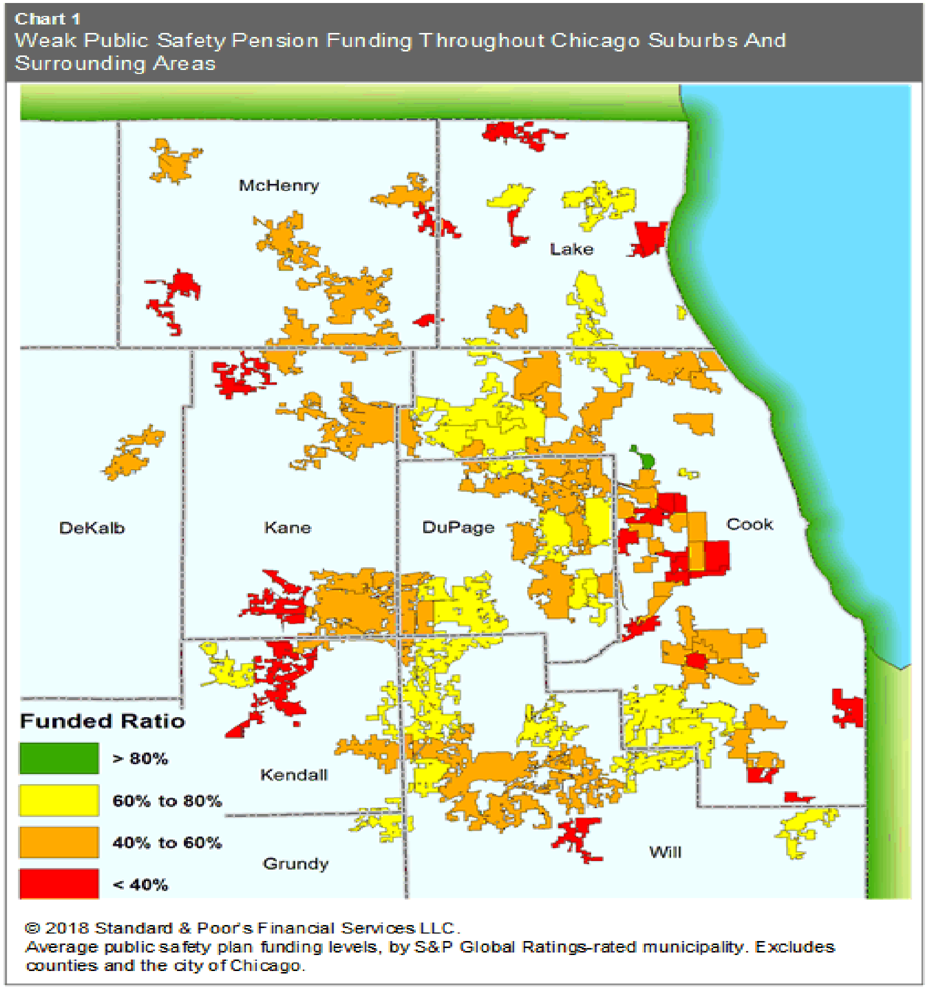
Pension Pressure…(Continued)

- Poor funding discipline, weak statutory funding requirements continue to pressure municipal public safety pension plans

- Actuarial assumptions used by these plans often defer pension contributions, creating greater potential for future pension payment acceleration

- Pension-related budgetary pressures likely to persist in the sector, particularly for munis with significantly underfunded pension plans and limited revenue growth

Source: Pension Pressures Are Likely To Weigh On Illinois Municipal Credit Quality, February 22, 2018

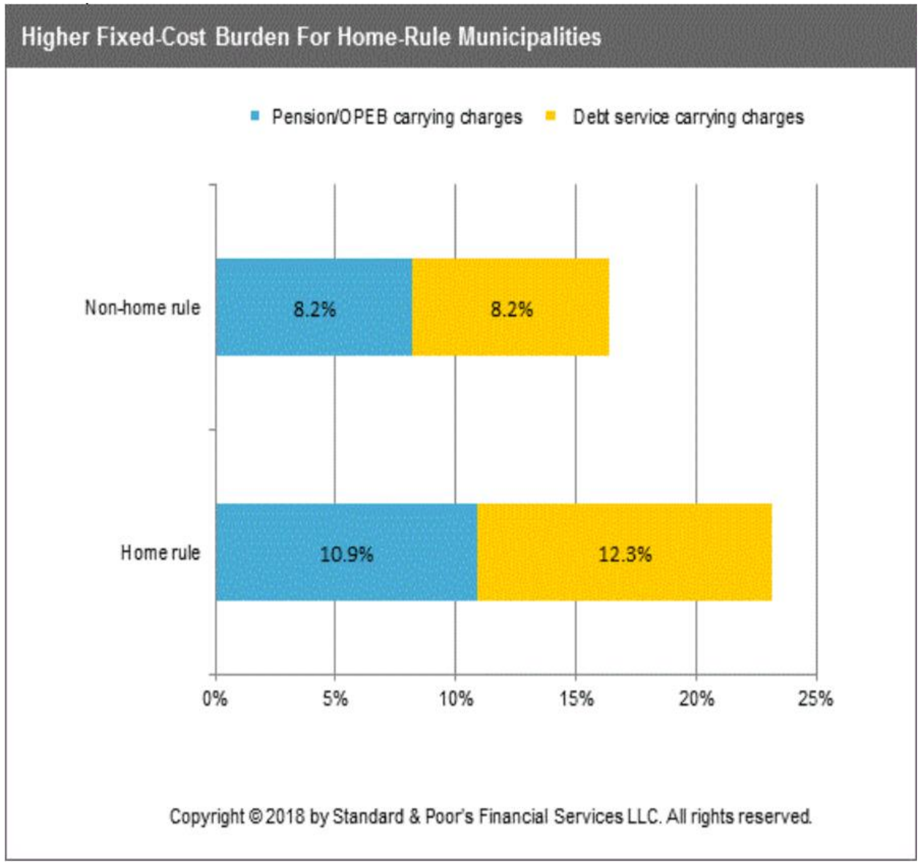


Pension Pressure…(Continued)

- We see evidence that elevated fixed costs (including OPEB and debt service) is crowding out discretionary spending on priority services and capital

- …and we expect these pressures to continue to grow as required pension contributions rise to meet plan funding requirements

Source: Pension Pressures Are Likely To Weigh On Illinois Municipal Credit Quality, February 22, 2018



The Upshot...

- **Rising pension costs will likely require many municipalities to either raise taxes or cut spending** in a way that will structurally realign budgets away from current-year service provision and capital investment and toward servicing higher pension costs

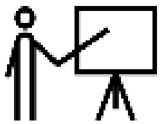
- **This could also leave some less capable of sustaining healthy credit characteristics** through periods of economic stress due to a rigid cost structures and high taxes

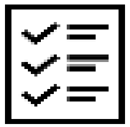
- **The most at-risk municipalities** include those that, along with poorly funded pension plans, have elevated debt burdens, limited ability to raise revenues or cut spending, and weaker economic characteristics

- **Issuers that proactively address pension liabilities** through adoption of conservative actuarial assumptions and strong funding discipline are less likely to see credit decline from pension pressure

S&P Local Government Ratings – Pension Approach

Direct Assessment	**Large Obligation**	Funded Ratio and Assumptions
	Potential for Accelerating Payments	Contribution practice ADC strength (consider amortization, payroll, etc.)
	Budget Stress	Pension/OPEB Cost as % of Total Governmental Fund Influence from assumptions and methods
Further Implications	**Management**	
	Budgetary Flexibility	
	Budgetary Performance	
	Institutional Framework	





Determining if a Local Government Has a Credible Plan

- **After we have evaluated a muni's exposure to unfunded liabilities**, rising costs, and resulting budgetary stress, we assess whether it has a credible plan to address these risks

- **Adopting realistic assumptions to value liabilities and employing strong funding discipline** lay the foundation for a credible plan, though may not be sufficient by themselves if there is a large backlog of deferred contributions

- **Components of a credible plan could include (among other things):**
    - Being actively involved in understanding cost projections and preparing future financing strategies / budgets accordingly
    - Implementing more conservative assumptions to value liabilities
    - Dedicating revenues, taxes, or budget surplus to help cover increasing contributions

- Though some common elements of pension reform are not currently available to IL munis because of statutory and constitutional constraints, there is still much that can be done

Some Examples of Pension Risk in Funding Policies & Plan Assumptions

- **90% funding by 2040** is a nonstandard funding target compared to the 100% funding target used elsewhere, and results in contributions that are lower than needed tor each full funding

- **Unrealistic investment rate of return assumptions** can result in underfunding (though we tend to find that IL munis do not generally have unusually high rate of return assumptions)

- **An aggressive investment allocation** can create greater volatility in asset values and, in turn, can create volatility in required contributions

- **Level percentage of payroll amortization** results in contributions that start small and grow over time, which can pressure a muni with limited growth potential. By contrast, level dollar amortization assumes a level stream of payments through the amortization period

Some Examples of Pension Risk…(Continued)

- **Open amortization or a lengthy amortization schedule** can result in inadequate funding, exposure to a large liability over a longer period of time, and negative amortization. Closed amortization over a shorter time frame may result in higher contributions, but also means less long-term risk

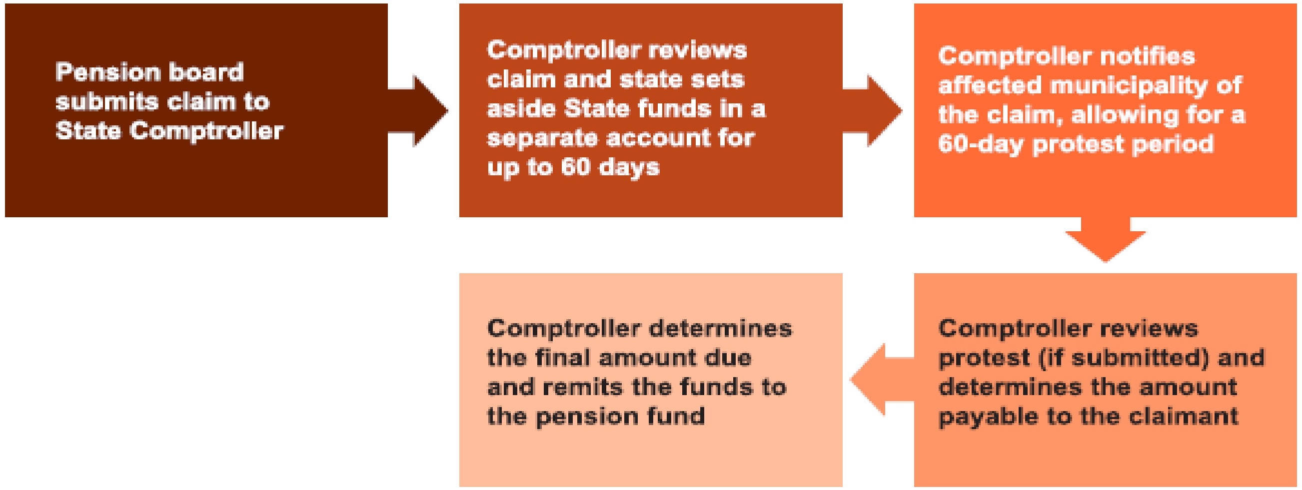
- **Static mortality projections** may underestimate how long pensioners will be able to collect benefits compared to generational mortality projections, which account for improvements in life expectancy over time

- **A high payroll growth assumption** is likely to overestimate future plan contributions, lowering near-term contributions and resulting in underfunding

Hot Topics: The Pension Intercept

- Pension fund intercepts, as seen in Harvey and North Chicago, could extend to other municipalities; may only be used in small number of cases
- If invoked, state fund intercept could cause immediate budgetary stress for certain municipalities

Process For Pension Fund Intercept
(IL Pension Code, IL Administrative Code)



Source: Pension Pressures For Illinois Municipalities Could Become An Imminent Budgetary Challenge Under The State’s Revenue Intercept Law, May 14, 2018

Hot Topics: Pension Obligation Bonds (POBs)

- POBs are taxable obligations that local governments issue as part of a plan to lower their unfunded pension liabilities.

- The rationale for issuing POBs is that they can be an effective tool if the bond proceeds are invested and achieve a rate of return that is greater than the interest rate owed over the term of the bonds (i.e., arbitrage)

- If that assumption holds, the obligor is thereby able to achieve lower pension contributions than it would have paid otherwise

Source: Pension Obligation Bonds' Credit Impact on U.S. State and Local Government Issuers, December 6, 2017

POBs – Some Recent Examples (Outside of Illinois)

- **Stockton, CA** – Sold $125 million in POBs in early 2007 to reduce its $152 million unfunded liability. With the market downtown in 2008, returns were well below the assumptions, which contributed—along with other factors—to the city's Ch. 9 filing in 2012

- **New Orleans, LA** – Issued $170 million in POBs in 2000 to fund its firefighter pension plan, though the plan did not live up to expectations in part because of aggressive assumptions. Officials had projected a 10% investment return and instead lost money in each of the first three year, and the plan was further complicated by the city's relatively high borrowing rate and use of variable rate debt with derivatives.

- **Alaska** – Alaska considered issuing POBs in 2016 to lower contribution requirements for budgetary relief. At the time we placed the rating on CreditWatch/Negative because we estimated that the state's debt ratios would balloon and absorb much of its bonding capacity. The state ended up not issuing the bonds, and we resolved the CreditWatch without a downgrade

Source: Pension Obligation Bonds' Credit Impact on U.S. State and Local Government Issuers, December 6, 2017

POBs – Considerations for Creditworthiness

- In general, the effects of POBs on our view of an obligor's creditworthiness are highly context-sensitive and are evaluated on a case-by-case basis. Still, there are common considerations.

- **Tradeoff between debt and pension liability -** POBs create a fixed debt service obligation in place of a potentially variable annual payment to fund a pension liability. While the issuance of POBs could alleviate risk associated with the pension liability, it thereby increases the debt burden and potentially diminishes future bonding capacity

- **Market return risk** – if the investment return assumptions are not met, the plan could end up being more costly than if the obligor had not issued POBs

- **Even if investment assumptions are met**, an obligor can still face a growing unfunded liability if other changes not anticipated at the time of POB issuance occur (e.g., changes in benefits, demographic shifts)

Source: Pension Obligation Bonds' Credit Impact on U.S. State and Local Government Issuers, December 6, 2017

POBs – Understanding the Financing Plan

- **From a credit standpoint, it is critical to understand the financing plan, the context, and the timing of POB issuance.** Some key questions include:
- How will the financing affect current contributions?
- Are the POBs being issued for budget relief?
- Will front-loaded savings lead to higher, unsustainable contribution rates in later years?
- What are the funding goals and how will the POBs affect these?

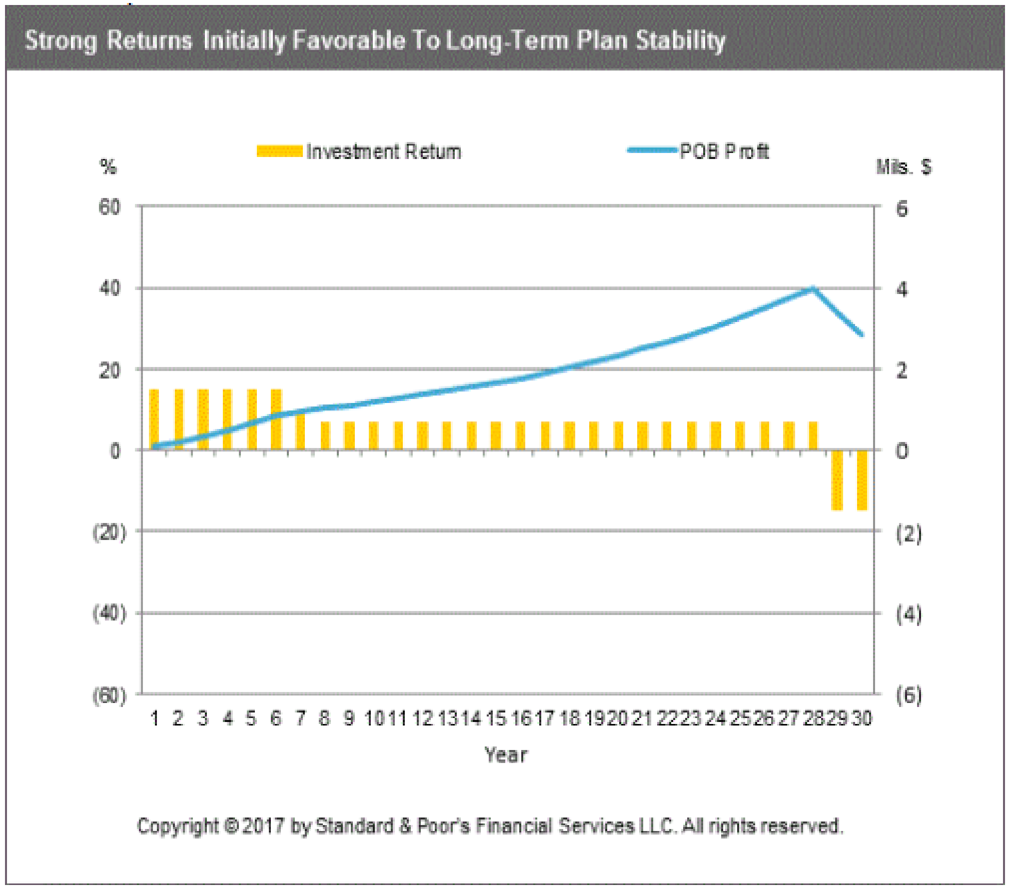
Source: Pension Obligation Bonds' Credit Impact on U.S. State and Local Government Issuers, December 6, 2017

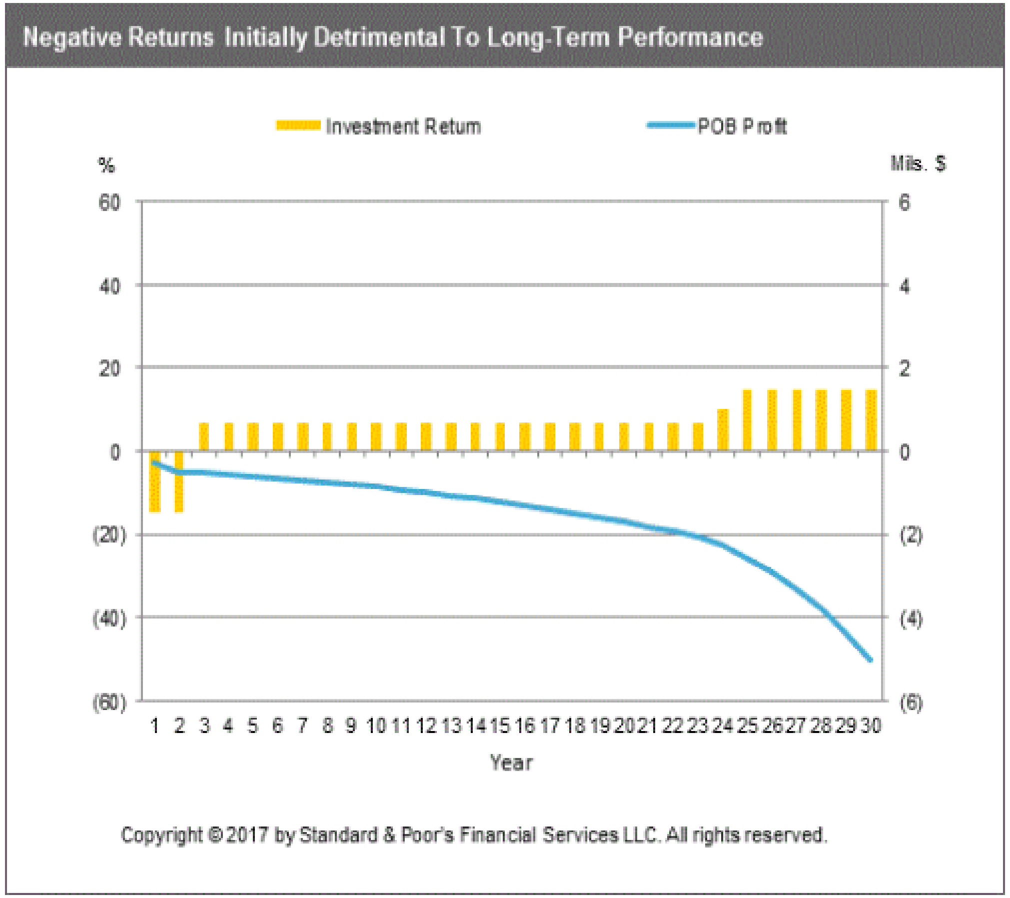
POBs – How Timing Affects Returns

- **The timing of POB issuance is critical in determining the “profit” gained from POB issuance**
- To illustrate this, the next slide shows two scenarios with no assumed arbitrage (i.e., both the bond rate and investment return are 7%).
- The first scenario is front-loaded with surplus positive earned in the first five years, the second is back-loaded with surplus earnings in the last five years.
- Both have POB proceeds of about $1.2 million paid back at 7% over 30 years of $100,000 payments, and both have a geometric average return of 7% over 30 years.

Source: Pension Obligation Bonds’ Credit Impact on U.S. State and Local Government Issuers, December 6, 2017

POBs – How Timing Affects Returns (Continued)





Source: Pension Obligation Bonds' Credit Impact on U.S. State and Local Government Issuers, December 6, 2017

POBs – How Timing Affects Returns (Continued)

- **To sum up,** POBs can offer short-term relief, but also come with long-term risks that can undermine near-term advantages

- POB issuance is a negative credit factor for distressed issuers

- Key pieces of our analysis will involve an understanding of the overall financing plan, larger strategy for dealing with pension liabilities, as well as an assessment of the key financing assumptions and other risks, such as market timing.

Source: Pension Obligation Bonds' Credit Impact on U.S. State and Local Government Issuers, December 6, 2017

UNDERSTANDING THE IMPACT OF LOW FUNDING LEVELS ON MARKET ACCESS

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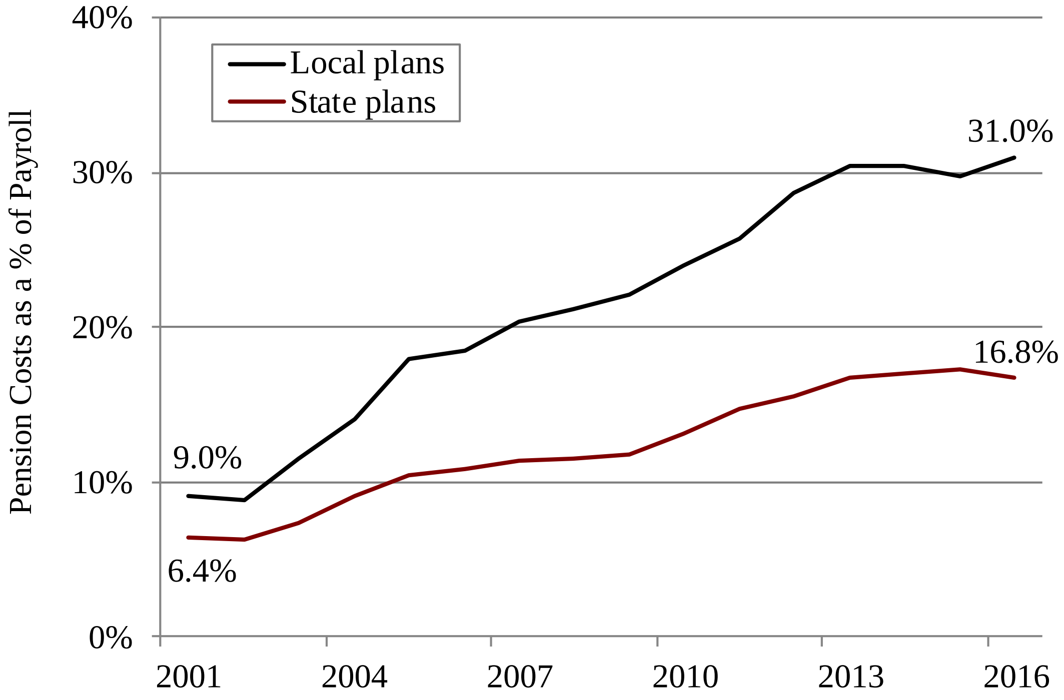
- The burden of public pensions on state and local budgets has been growing steadily (1)
  - State pension costs have more than doubled from 6.4% of payroll in 2001 to 16.8% of payroll in 2016
  - Local pension costs have more than tripled from 9.0% of payroll in 2001 to 31.0% of payroll in 2016



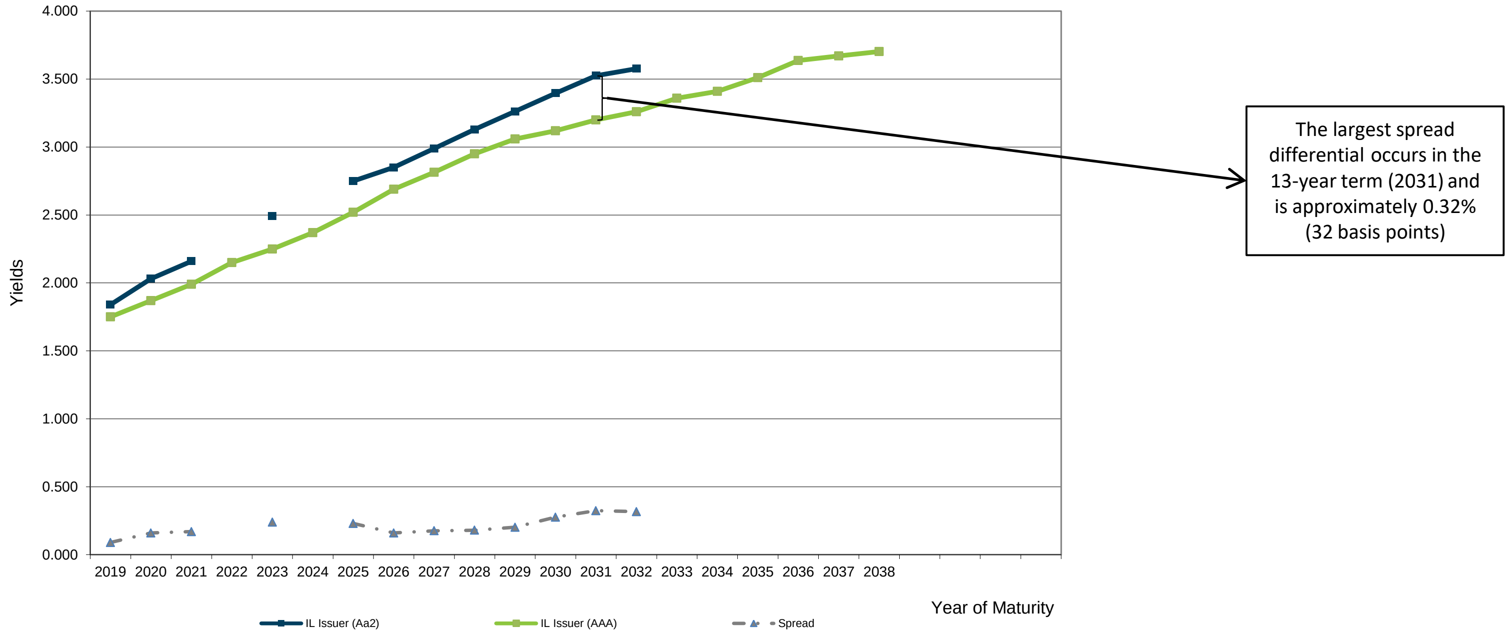
Source: Public Plans Database (PPD) (2001-2016).

(1) Aubry, Jean-Pierre, Carline Crawford, and Alicia Munnell. "How Have Municipal Bond Markets Reacted To Pension Reform*?" Center for Retirement Research at Boston College* October, 2017. Web. (accessed August 23, 2018)

UNDERSTANDING THE IMPACT OF LOW FUNDING LEVELS ON MARKET ACCESS

- As a result of this cost growth, rating agencies have increased the importance of pensions in their credit ratings [1]
  - This is important because the cost on municipal bonds is closely related to the issuer's credit rating

Illinois Issuer (Aa2) vs. Illinois Issuer (AAA) Comparison (Non-Bank Qualified)



- While prior analysis by the Center for Retirement Research at Boston College (the Center) failed to find a statistically significant relationship between pension finances and the bond ratings of state and local governments, the heightened scrutiny of pensions suggests that this relationship may be changing [1]

(1) Aubry, Jean-Pierre, Carline Crawford, and Alicia Munnell. "How Have Municipal Bond Markets Reacted To Pension Reform*?" Center for Retirement Research at Boston College* October, 2017. Web. (accessed August 23, 2018)

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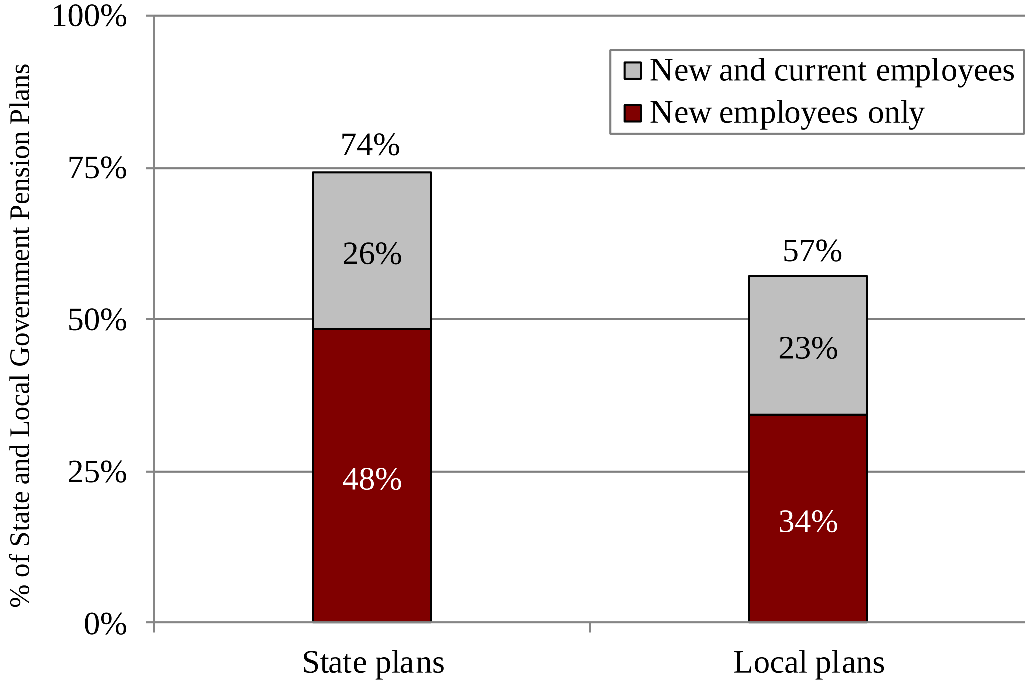
- Amid rising pension costs, state and local governments have instituted pension *benefit* reform (1)



Source: Aubry and Crawford (2017).

- 74% of state plans made some type of reduction compared to 57% of local plans (1)
- Majority of plans making changes reduced benefits for new employees, significant portion also cut benefits for current employees or retirees (1)
- In terms of reducing employer costs and improving pension finances in the near term, cuts to current member benefits are most meaningful (1)

(1) Aubry, Jean-Pierre, Carline Crawford, and Alicia Munnell. "How Have Municipal Bond Markets Reacted To Pension Reform*?" Center for Retirement Research at Boston College* October, 2017. Web. (accessed August 23, 2018)

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- Empirical Analysis [1]

    - The task is to test the relationship of pensions to state and local borrowing costs, controlling for other factors that might impact these costs, such as fiscal management and finances or the state of the local economy

    - The sample in the Center's study contains 142,214 state bond issues and 54,677 local bond issues that were issued between 2005 and 2014

    - The analysis focuses on tax-exempt, fixed-rate, general obligation bonds issued directly by state and local governments

        - Data is then limited to bonds issued by the 50 states and 173 major cities for which pension data are readily available

        - These restrictions reduced the number of bond issues to 9,839 state bond issues and 7,396 local bond issues

(1) Aubry, Jean-Pierre, Carline Crawford, and Alicia Munnell. "How Have Municipal Bond Markets Reacted To Pension Reform?" *Center for Retirement Research at Boston College* October, 2017. Web. (accessed August 23, 2018)

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- Empirical Analysis (continued) (1)
  - Linear regression model
    - Dependent variable: Risk premium
      - Spread between yield on municipal bond and yield on US Treasury bond of same maturity issued at approximately the same time
    - Independent variables:
      - Pension variables
        - Unfunded actuarial liability (UAAL, now referred to Net Pension Liability (NPL) per GASB 67/68) as % of revenue
        - Benefit reforms
      - Fiscal Status variables
        - Expenditure growth
        - Debt as a % of revenue
      - Economic Condition variables
        - Unemployment rate
        - Dependency ratio
      - Marginal State Income Tax Rate
      - Bond Maturity
      - Management of State Government variables (state only)
        - Economic advisors
        - Consensus forecasts
      - State's Credit Rating (local only)

(1) Aubry, Jean-Pierre, Carline Crawford, and Alicia Munnell. "How Have Municipal Bond Markets Reacted To Pension Reform?" *Center for Retirement Research at Boston College* October, 2017. Web. (accessed August 23, 2018)

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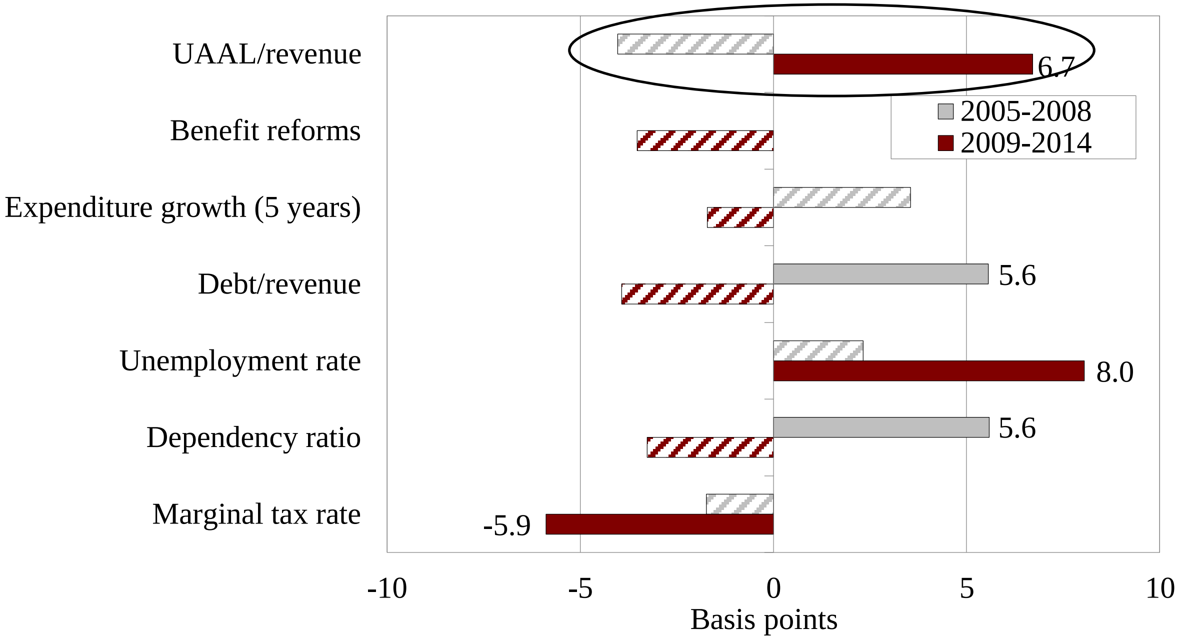
- Results (1)
  - State regression
    - Pre-crisis
      - Pension finances are not related to the risk premium
    - Post-crisis (since 2009)
      - From 2009-2014, 1-standard-deviation increase (approximately 31%) in the UAAL as a % of revenue was associated with a 0.07% (7 basis point) increase in the spread
      - State issued bonds averaged a 33 basis point spread in that same period



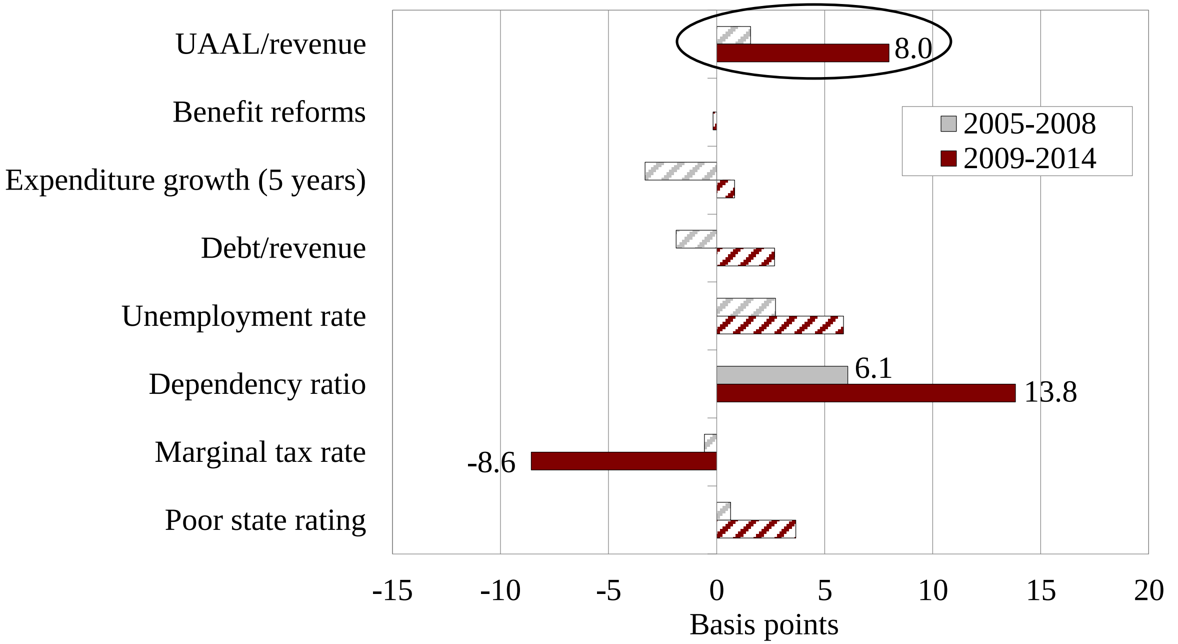
Note: Solid bars are statistically significant at the 90-percent level or better. For continuous variables, the results shown are for a one-standard-deviation change; for dummy variables, they are for a change from zero to one.

Sources: SDC (2005-2014); U.S. Census Bureau (2000-2014); PPD (2005-2014); and Natl Assoc. of State Budge Officers (2008).

(1) Aubry, Jean-Pierre, Carline Crawford, and Alicia Munnell. "How Have Municipal Bond Markets Reacted To Pension Reform*?" Center for Retirement Research at Boston College* October, 2017. Web. (accessed August 23, 2018)

UNDERSTANDING THE IMPACT OF LOW FUNDING LEVELS ON MARKET ACCESS

- Results (continued) [(1)]
  - Local regression
    - Pre-crisis
      - Pension finances are not related to the risk premium
    - Post-crisis (since 2009)
      - From 2009-2014, 1-standard-deviation increase (approximately 75%) in the UAAL as a % of revenue was associated with a 0.08% (8 basis point) increase in the spread
      - Local issued bonds averaged a 47 basis point spread in that same period



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- Conclusion [1]
  - Pensions have become increasingly relevant to the municipal bond markets and can have a meaningful impact on the borrowing costs of a municipality
  - As such, adequate funding, monitoring, and management of public pensions should continue to be an important component of fiscal management for state and local governments

(1) Aubry, Jean-Pierre, Carline Crawford, and Alicia Munnell. "How Have Municipal Bond Markets Reacted To Pension Reform?" *Center for Retirement Research at Boston College* October, 2017. Web. (accessed August 23, 2018)

STEPS TO IMPROVE
PENSION FUNDING LEVELS

STEPS TO IMPROVE PENSION FUNDING LEVELS

- Are Pension Obligation Bonds (POBs) the Answer?
  - Fundamental purpose behind issuing POBs
    - Issuer could potentially borrow funds at a taxable interest rate that is considerably lower than the interest rate earned on the investment of those same funds
  - Advantages
    - POBs convert a soft liability to a hard liability (1)
      - Pension contribution can vary year-to-year depending on actuarial adjustments and even budgetary constraints
      - Debt service payment on a POB cannot be changed over time
      - A fixed payment established once the POBs are sold
      - Credit positive because it can no longer avail itself to deficit financing for the sake of budgetary flexibility
      - Forces the issuer to reduce the liability according to a fixed schedule
    - POBs offer budgetary relief during times of economic crisis (2)
      - Instead of allocating funds away from an issuer's operating budget, POBs can be issued to make pension payments that would otherwise be difficult to make

(1) Kemp Lewis, "In Defense of Pension Obligation Bonds," The Bond Buyer 10 March 2015, http://www.bondbuyer.com/news/commentary/indefenseofpensionobligationbonds10712071.html, Web.
(2) Naomi Jagoda, "Paper: POB Issuers Tend to be Financially Vulnerable," The Bond Buyer 8 July 2014, http://www.bondbuyer.com/news/washingtonbudgetfinance/paperpobissuerstendtobefinanciallyvulnerable10641941.html, Web.

STEPS TO IMPROVE PENSION FUNDING LEVELS

- Are Pension Obligation Bonds the Answer? (continued)
  - Disadvantages
    - POBs are financing mechanisms that are complex and burdened with considerable risk
      - Often include the use of guaranteed investment contracts, swaps, or derivatives
      - Before selling POBs, issuer must fully study, understand, and be comfortable with the risks of these financing mechanisms, which can include:
        - Counterparty risk
        - Credit risk
        - Interest rate risk
    - Investments may fail to earn the borrowing rate of the bonds, increasing total liability of issuer
      - Debt service requirements of POBs, AND
      - Pension liabilities from underperforming investments
    - POBs must be issued as taxable bonds
      - Some taxable bonds are issued without call options making restructuring costly in the future
      - Call options provide financing flexibility for an issuer that will either save interest cost or create additional debt capacity for new bonds when the call option is exercised.
      - Issuing with a call option is possible, but would increase the cost of the debt, and therefore increase the required rate of return on the investments

(1) Kemp Lewis, "In Defense of Pension Obligation Bonds," The Bond Buyer 10 March 2015, http://www.bondbuyer.com/news/commentary/indefenseofpensionobligationbonds10712071.html, Web.
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STEPS TO IMPROVE PENSION FUNDING LEVELS

- Are Pension Obligation Bonds the Answer? (continued)
  - Disadvantages (continued)
    - POBs typically seen as a credit negative by rating agencies, especially in the absence of a more comprehensive plan
      - **Negative impact on debt metrics** – issuance of debt could shift the debt profile and increase debt service or use of statutorily or otherwise defined debt capacity (1)
      - **May be sign of weak management or budgetary performance** (1)
        - Financing plan with aggressive market return assumptions
        - Exchanging long-term risk of unsustainable future contributions for immediate budgetary relief
      - **Market Timing Risk** – poor market returns in the initial years of investment will hurt a POB's profitability for many years (1)
        - This risk may be mitigated by structuring the POBs over multiple issuances (or contributions), similar to a dollar-cost averaging approach one might take in a 401(k) plan

(1) Andy Hobbs, Todd Kanaster, and Susan Corson, "Pension Obligation Bonds' Credit Impact on US State and Local Government Issuers," S&P Global Ratings 6 December 2017.

STEPS TO IMPROVE PENSION FUNDING LEVELS

- Are Pension Obligation Bonds the Answer? (continued)
  - The effectiveness of POBs [(1)]
    - The Center calculated the internal rate of return for all POBs issued in a given year
    - Analysis based on universe of taxable POBs issued since the passage of the Tax Reform Act of 1986 through 2013
    - Analysis assumed that the proceeds of each bond are invested in accordance with the allocation of the aggregate assets of state and local pension funds from the Federal Reserve's Flow of Funds
      - Approximately 65% in equities and 35% in bonds
      - Used the S&P 500 total return index and Barclays 10-year bond total return index to approximate how POB proceeds grew over time

(1) Munnell, Alicia, Jean-Pierre Aubry, and Mark Cafarelli. "An Update on Pension Obligation Bonds," *Center for Retirement Research at Boston College* October, 2017. Web. (accessed August 23, 2018)

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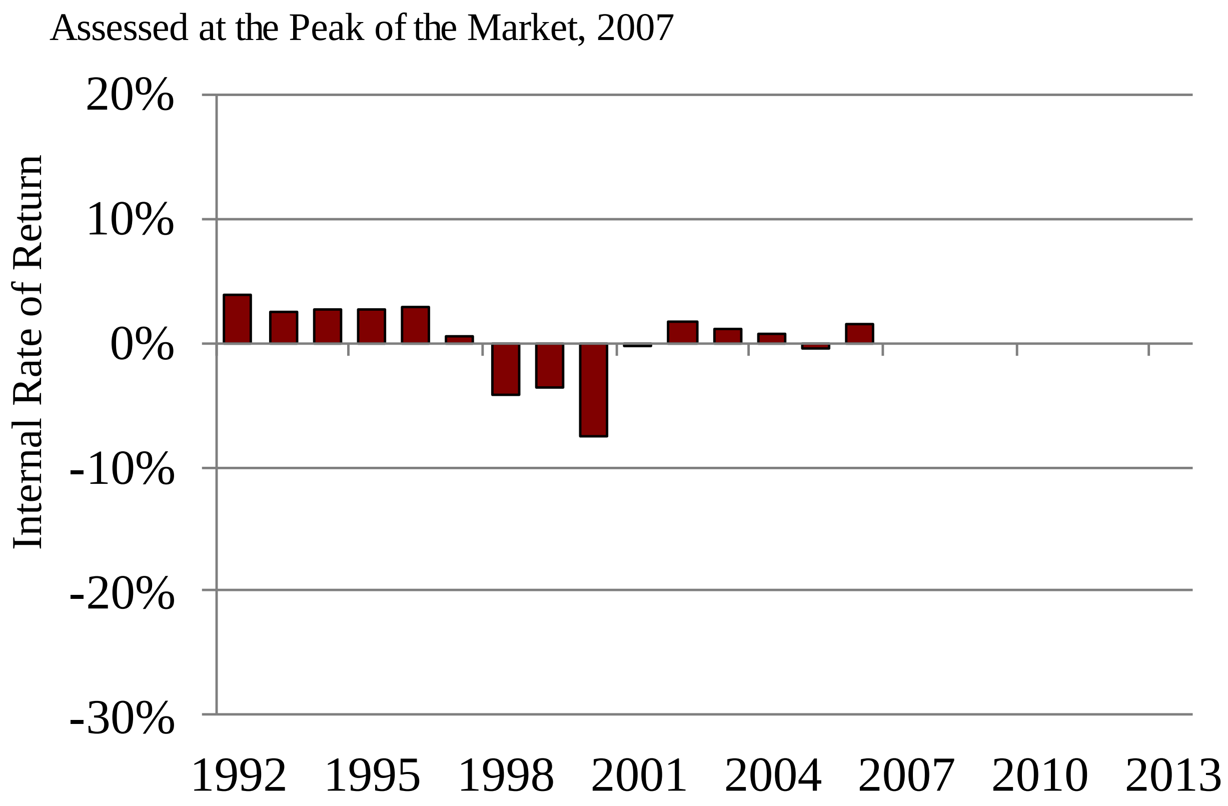
  - The effectiveness of POBs (continued) [1]



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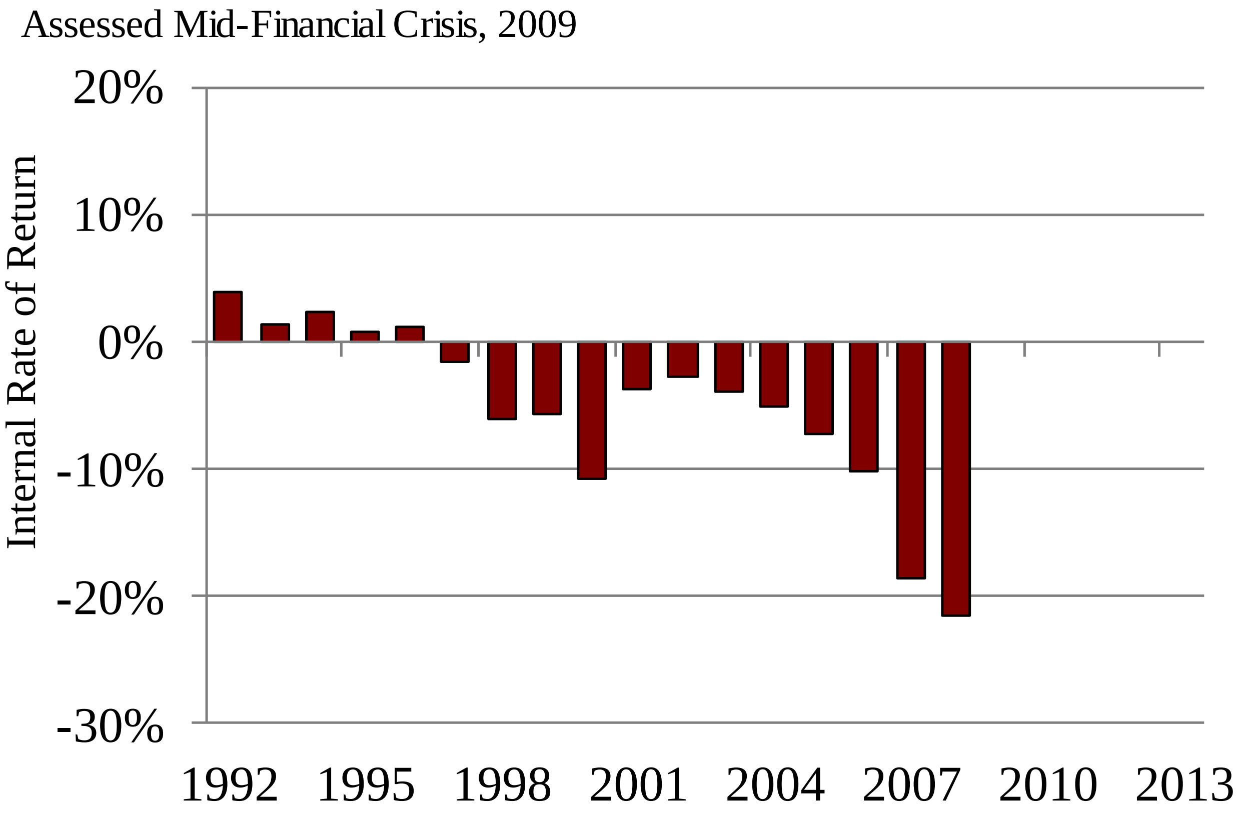
  - The effectiveness of POBs (continued) (1)



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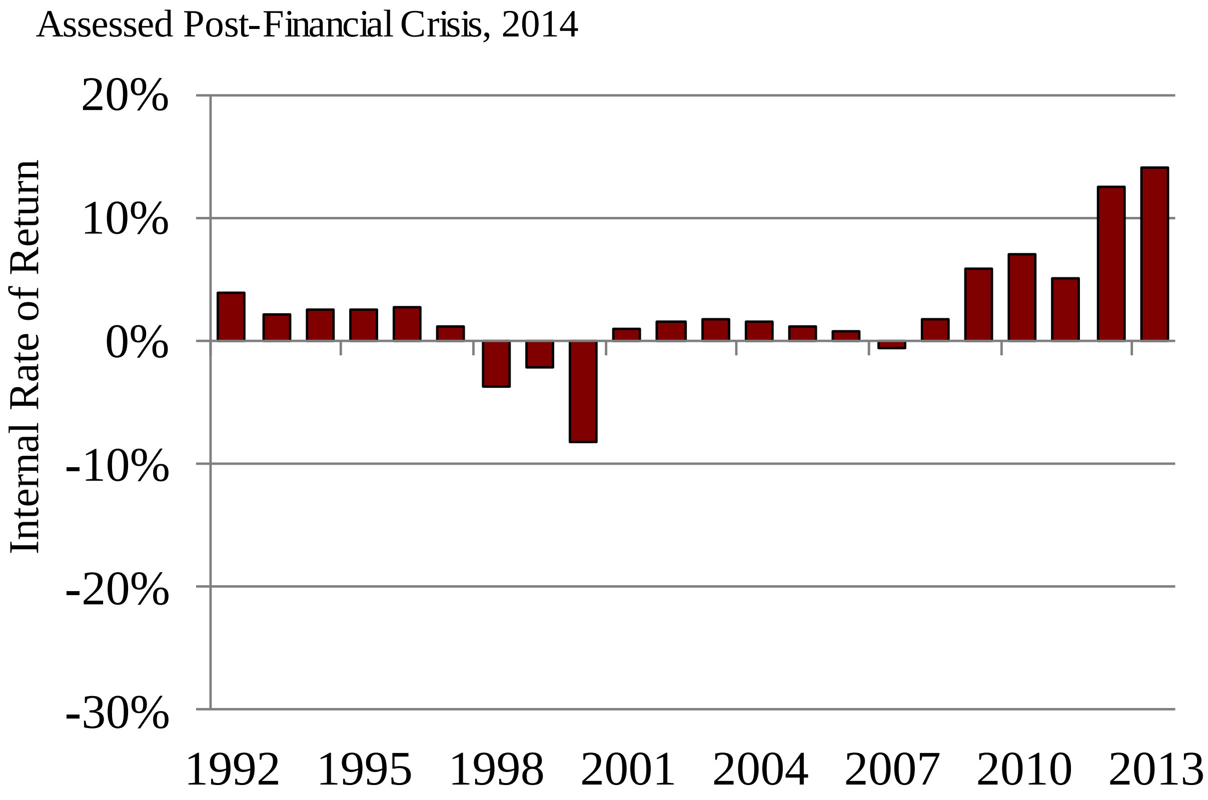

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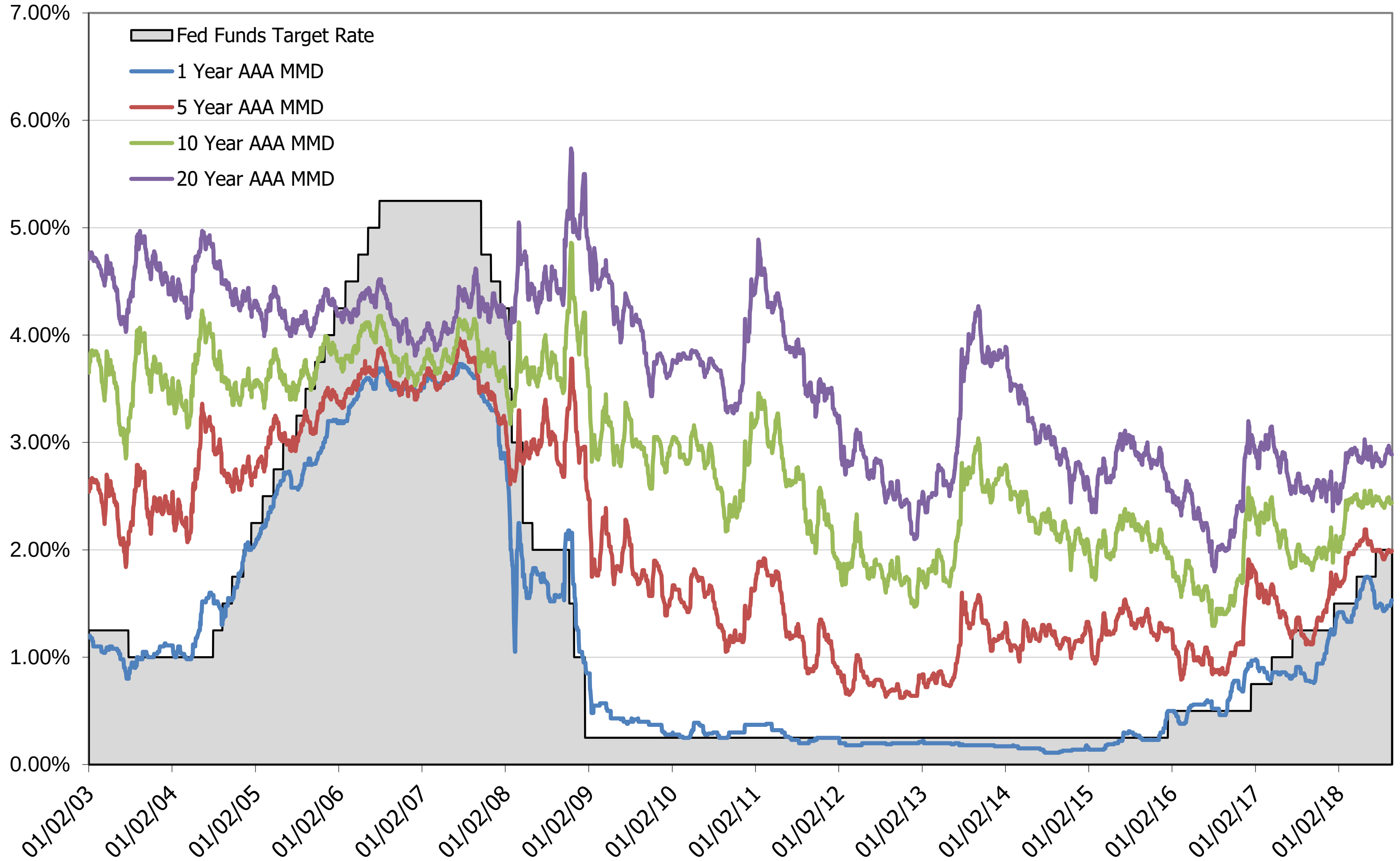
STEPS TO IMPROVE PENSION FUNDING LEVELS

- Other disciplined measures to address pension funding levels
  - Make intentional annual contributions to achieve acceptable funded ratios
    - The statutory minimum
    - Municipality’s own actuary’s recommendation
    - Amount requested by the pension fund
    - State Department of Insurance recommendation
    - Prior year’s contribution amount
    - Disciplined review of municipality’s budgetary constraints
  - Establish pension funding policy
  - Authorize additional contributions
  - Utilize alternative financing mechanisms
    - Cash is fungible
    - Use capital funds originally intended for capital projects to address pension funding levels, and
    - Issue debt to address capital projects

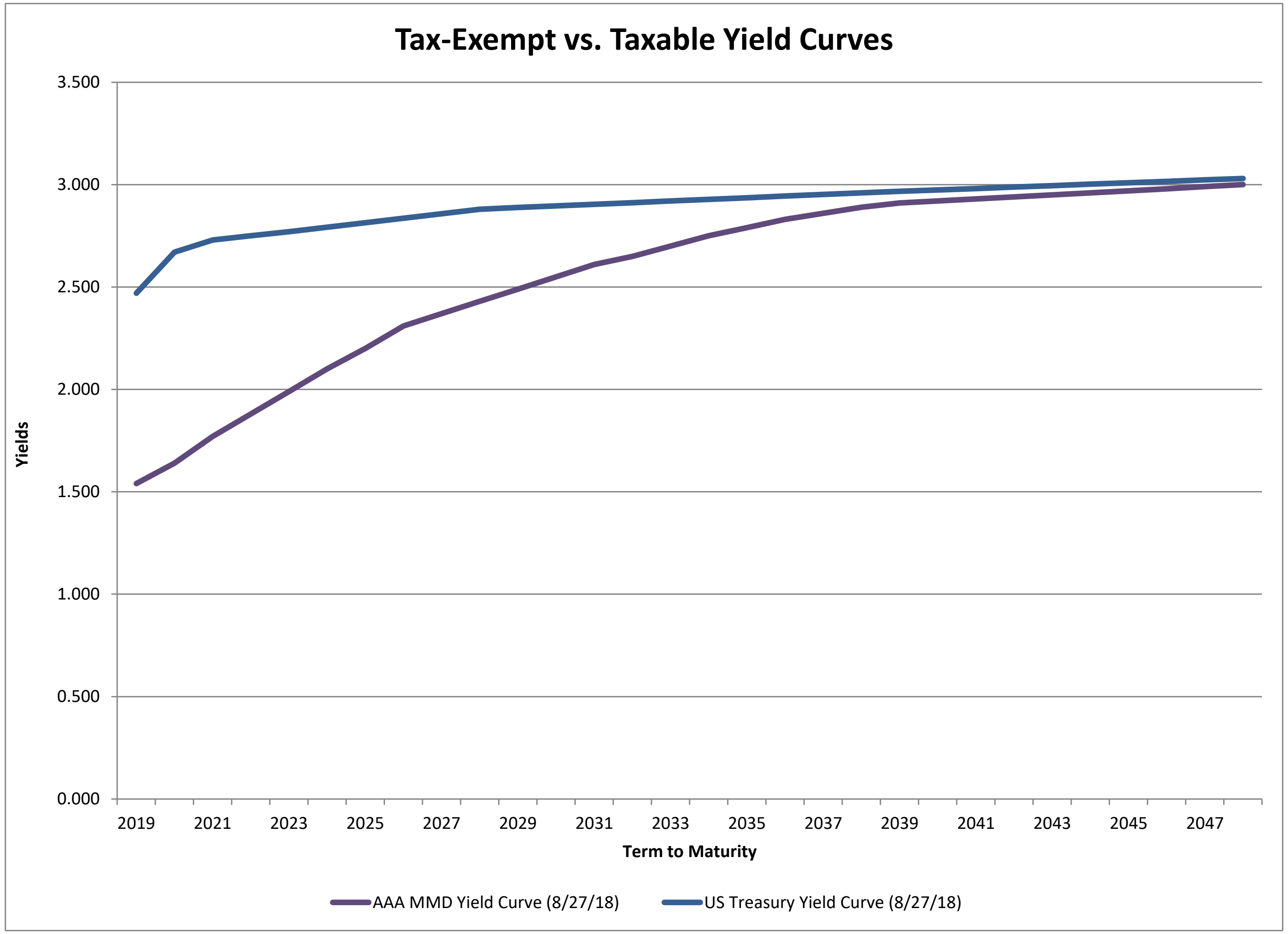
(1) Munnell, Alicia, Jean-Pierre Aubry, and Mark Cafarelli. “An Update on Pension Obligation Bonds,” *Center for Retirement Research at Boston College* October, 2017. Web. (accessed August 23, 2018)

MARKET UPDATE

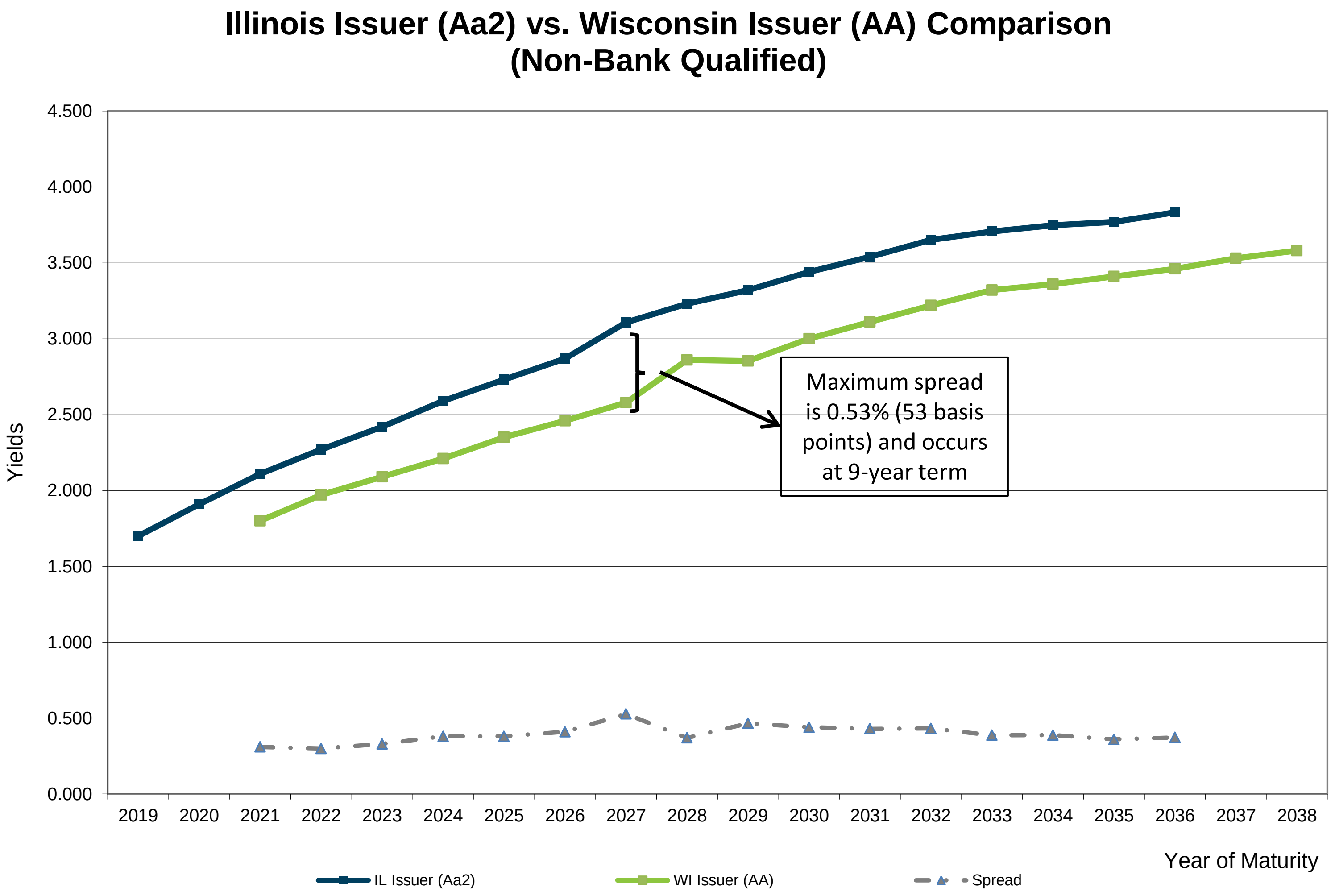
MARKET UPDATE – CURRENT AND HISTORICAL INTEREST RATE LEVELS



MARKET UPDATE – TAX-EXEMPT vs. TAXABLE YIELDS



MARKET UPDATE – ILLINOIS PREMIUM



*Highlighted Illinois transaction was sold on 7/09/18. Highlighted Wisconsin transaction was sold on 6/15/18. Indicated spreads take into account change in AAA MMD.
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