Who Watches the Watchman?
New York State Common Retirement Fund

BY ANDREW ANG

ABSTRACT
The state comptroller was sole trustee of New York State’s Common Retirement Fund, which had $140.6 billion in assets and more than one million participants in 2011. This power had been abused by several in the office for decades. What type of governance would best serve the pension system’s members and the taxpayer, who ultimately bore financial responsibility for the fund?
Introduction: Hevesi’s Law

*It is long past time that we learned the lessons of the Hevesi case and made permanent changes to our system that will stop the culture of corruption.*

—Andrew Cuomo, NY Governor

In 2011, Governor Andrew Cuomo introduced a piece of legislation, nicknamed “Hevesi’s Law,” intended to ban New York state government officials convicted of abusing the powers of their office from collecting a pension upon retirement. The bill was named after Alan Hevesi, who served as state comptroller from 2003–2006, and who had been convicted of accepting $1 million in gifts in an illegal “pay-to-play” exchange. The state comptroller is the sole trustee of the New York State Common Retirement Fund (CRF), which had assets of $141 billion in December 2010. While serving as comptroller, Hevesi abused his position to extract gifts from an investment management firm looking to do business with the fund. Several of his aides were also convicted of accepting gifts in exchange for access to the fund.

The Hevesi scandal brought significant attention to the unique powers of the office of the comptroller, prompting many government officials and the media to question the governance structure of the CRF. In reaction to the scandal, a number of preventative measures had been put in place. Placement agents, paid intermediaries, and registered lobbyists were banned from involvement with the fund. The information flow to the public was improved via the release of monthly transaction reports. But these changes did not address the overall governance structure of the fund. Many questioned whether larger changes were necessary. Was it wise to have only one person controlling this large pool of money? Were there other governance structures that might better serve the interests of the fund members and the New York taxpayer, who ultimately bore financial responsibility for the liabilities of the fund?

History of the Fund

The New York State Employees’ Retirement System (ERS) was established in 1921; in 1966, the Police and Fire Retirement System (PFRS) was created. Together, the ERS and the PFRS comprise the New York State and Local Retirement System (“the System”). The assets of the ERS and PFRS are held in the CRF, which is managed by the state comptroller and the divisions of Pension Investment and Cash Management (PICM) and Retirement Services (both of which report to the comptroller). The state, as employer, contributes to the system and some employees make their own contributions as well.

As of December 31, 2010, the system had $140.6 billion in assets, more than one million participants (including members, retirees, and beneficiaries), and paid out $7.7 billion in benefit payments in fiscal year 2010, making it one of the largest pension plans globally. In 2009, it was ranked the ninth largest pension plan in the world (see Exhibit 1). The system also operated more than 150 distinct plans, compared with the eight plans managed by the average public retirement system. These plans are mostly defined benefit plans, where the pension and other benefits are based on fixed rules that are a function of a member’s age, length of service, salary or age, and cost of living adjustments. The benefits available to members had gradually become less generous over time (see Appendix A). Older workers in Tier 1, starting before July 1, 1973, enjoyed the largest benefits while the workers in Tier 5, starting employment after January 1, 2010, had claim to the least generous benefits.

The recent history of the CRF has been plagued with a number of scandals. Edward Regan, who served as comptroller from 1979–1993, was investigated in 1989 by the New York Commission on Government Integrity for directing state business to investment banks and lawyers who had donated to his campaign. The commission also found that an adviser to the comptroller’s office had used office letterhead to produce a campaign agenda which apparently tied the awarding of government contracts with campaign contributions.

H. Carl McCall served as comptroller from 1993–2002. He was criticized for writing to companies in which the CRF had invested on state letterhead asking them to consider the resumes of a number of friends and family members. McCall was also accused of directing CRF business toward campaign contributors. In a class action suit led by the CRF, McCall selected two law firms which had donated approximately $100,000 to his election campaign. The selection of these firms was contested by the other plaintiffs in the case, but the district court ruled that there was inadequate proof of a “pay-to-play” scenario. The third circuit court upheld this finding.

McCall was succeeded by Alan Hevesi, who was forced to resign in 2006, and pled guilty to a felony charge of defrauding the government, following allegations that he used state workers to chauffeur his wife to doctor appointments. In 2007, then Attorney General Andrew Cuomo launched an investigation into “systemic conflicts of interest” in the comptroller’s office during Hevesi’s tenure. Hevesi was accused, and eventually pleaded guilty, of accepting $1 million in gifts and travel from Elliot Broidy, the founder of Markstone Capital Group, in exchange for granting Markstone a $250 million investment mandate. Hevesi’s political advisor, Henry Morris, pled guilty to taking placement fees on the CRF’s alternative investment portfolio and to providing access to the fund in exchange for campaign contributions. David Loglisci, former chief investment officer of the fund, also pled

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4 Bentley, “Comptroller as Sole Trustee.”
guilty in connection with the scandal. In total, eight people pled guilty and $170 million was recovered on behalf of the fund.5

Under Thomas DiNapoli, who took over from Hevesi as New York state comptroller in 2007, a number of initiatives aimed at preventing fraud and improving transparency have been introduced. In 2008, placement agents, paid intermediaries, and registered lobbyists were banned from involvement with the fund.6 DiNapoli also sought to improve the flow of information via (1) the release of monthly investment transaction reports; (2) quarterly disclosure of fund performance (this disclosure had previously been annual); (3) “reinforcing the internal investment evaluation process to include reviews by the heads of all asset classes;” and (4) “expanding external advisory committees to enhance the review of investment procedures.”7 In September 2009, DiNapoli banned the CRF from doing business with any advisor who had contributed to the campaign of a candidate for state comptroller.

**Finances and Asset Allocation**

The asset allocation of the CRF is typical of that of other large pension funds (see Exhibit 2). The CRF holds a diversified portfolio in bonds, equities, real estate, and alternative assets (which includes private equity and hedge funds) following the endowment model. At the end of March 2010, the CRF’s bond, listed equity, alternatives, and real estate allocations were 23%, 59%, 13%, and 5%, respectively. This was not very different from other large pension funds (see Exhibit 3) with a typical peer fund holding slightly more bonds and slightly fewer equities. The portfolio allocations of public pension funds to equities and other risky investments has dramatically increased over time, moving from primarily cash and fixed income during the 1950s to over 50% equity allocations during the late 2000s.

The performance of the fund was 25.9% over the 2009–10 fiscal year (see Exhibit 4), following the rebound of financial markets after the financial crisis over 2008–09 during which the CRF return was -26.4%. The fund’s investment expenses were 27 basis points in 2010 (see Exhibit 5). This is coincidentally the same as the median expense ratio for defined benefit plans in the samples studied by Bauer, Cremers, and Frehen (2010), which covers 40% of the US pension industry over 1997–

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6 Intermediaries and placement agents are frequently retained by asset managers to assist them in raising funds and winning mandates. Many argue that banning them would put smaller asset managers at an unfair disadvantage in winning new business.
2006. The largest 30% of defined benefit plans, however, have expense ratios of 15 basis points per year, much lower than the CRF’s expenses.

Asset allocation theory developed by Paul Samuelson and Robert Merton in the late 1960s and early 1970s advocates holding a liability-hedging portfolio, which has the highest possible correlation to the liabilities of the agent, and an investment portfolio, which invests the funds in excess of the present value of the liabilities in accordance with the agent’s risk preferences and horizon. The investment portfolio could also take advantage of predictability and other variation in investment opportunity sets. A defined benefit pension fund’s liabilities consist primarily of current and future pensions paid to members.

It is still an open question how much equities and other risky assets are appropriate for public defined benefit plans. If the fund’s liabilities are measured only by the current and future payments to present beneficiaries earned to date, not taking into account any future accruals of benefits by existing or future members, then the liability is best matched with bonds with the same cash flow pattern or duration. If the fund’s liabilities take into account future benefits earned by existing employees and the entry of new employees, then stocks could be an appropriate liability hedge as wage growth is positively correlated with equity returns. Even in this case, a portfolio mostly consisting of bonds could be appropriate as it reduces the volatility of funding levels and the likelihood of default, especially in periods where economic growth is low and governments are severely constrained.

For public pension plans, there is another important economic distortion. The true economic value of the fund liabilities differs significantly from the actuarial valuation of the liabilities (see Appendix B). Public pension plan liabilities are discounted by the expected return on assets, rather than a discount rate reflecting the risk of the liabilities. The actuarial rate of return assumed by CRF is 8% (see Exhibit 4), which is typical of state pension plans and roughly reflects the expected returns from a 60–40% equity-bond split of the typical asset allocation of a pension fund. According to the actuarial valuation, the liabilities of the CRF are well covered by the fund’s assets (see Exhibit 6) and the system has had funding ratios (the ratio of assets to liabilities) of over 100% since 2005. This is

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much better than the typical state pension fund (see Exhibit 7). In 2008, Wilshire Consulting calculated that 95 out of 107 state pension systems were less than 100% funded compared to the market values of the fund assets, with 35 systems less than 70% funded.

However, these actuarial valuations are done using a discount rate of approximately 8%. If more realistic discount rates are used, i.e., rates closer to the true risk-free nature of the state’s obligation to pay, then the actuarial liabilities significantly understate the true liabilities. Novy-Marx and Rauh (2009) estimate that at December 2008 the New York system had a true liability of $356.2 billion, where the liabilities are discounted using risk-free rates, compared to a stated actuarial liability of $277.0 billion. They estimate the true under-funded status of the fund to be equivalent to -263% of annual tax revenue or -15% of gross state product.

There are two ways to meet this economic shortfall: to reduce benefits or to increase contributions. New York State has been doing both the former, as new entrants receive less generous benefits than their predecessors, and the latter (see Exhibit 8), as the total employer contributions, and thus the monies transferred from taxpayers to system beneficiaries, have generally increased since the early 2000s.

**Current Governance Structure**

*In New York, the state comptroller is sole trustee of the New York State Common Retirement Fund (CRF). Under this model, Comptroller DiNapoli is directly accountable for the performance, oversight, and management of the Fund.*

—Website, New York State Comptroller

Management of the New York State and Local Retirement System is governed by the Retirement and Social Security Law (RSSL). As the “sole trustee,” the comptroller “is responsible for making sure the CRF meets its annual performance benchmarks while mitigating risks to the CRF’s security. The comptroller also ensures that investment policies and practices adhere to the highest levels of ethical conduct and transparency.” Supporting the comptroller in these duties is the first deputy comptroller who in turn oversees the deputy comptrollers. One deputy comptroller heads up the 60-person division of Pension Investment and Cash Management (PICM), and the other leads Retirement Services. The PICM is responsible for investing the fund and all related activities, and Retirement Services is responsible for the accounting, actuarial, and administrative functions.

The comptroller also utilizes external advisors, consultants, and legal experts to provide him with investment advice. However, there are no external guidelines on how these advisors, consultants, and other experts are appointed or monitored as they are under the complete purview of the comptroller. There is an advisory council for the retirement system, which provides input to the overall design and management of the pension system. Two committees give specific advice on asset allocation and investments: an investment advisory committee and a real estate advisory committee. Finally, there is an actuarial advisory committee to give advice on actuarial assumptions and valuation techniques, and other actuarial considerations. All of these committees are advisory to the comptroller, who retains ultimate authority over the system. While the comptroller operates within certain mandated guidelines, such as a limit on concentration risk within the portfolio that was established by the RSSL, he has almost complete discretion in making the primary portfolio decisions.

In addition to managing the CRF, the comptroller’s responsibilities include administration of the state payroll, maintaining the state’s accounting system, auditing state agencies, and overseeing the finances of local governments.

**The Role of the State**

The key difference between state pension funds and corporate pension funds is the multiple roles played by the government, and hence taxpayers. This has important implications for governance structure, investment practice, funding rules and practices, and disclosure to stakeholders. Unlike a corporate pension plan, in a public plan, the government simultaneously plays multiple roles: it is the regulator or supervisor, employer or plan sponsor, service provider, trustee or fiduciary agent, and residual guarantor. A corporation’s pension liabilities are the responsibility of the corporation, and so any pension promises made to workers must be funded out of that company’s profits. In contrast, governments have the ability to tax and can make promises to workers that are funded by future, not existing, tax revenues; by the issuance of new public debt; or by reducing public spending from other areas, which are reallocated to finance unfunded pension liabilities. The role of government thus creates specific agency problems in public pension plans that are absent in corporate pension plans.

Public pension plans are often mandated to make investments that are politically, rather than economically, motivated. Mitchell and Hsin (1994) find that public pension funds required to have a

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15 Under certain circumstances, a bankrupt firm’s pension fund is transferred to the Pension Benefit Guaranty Corporation (PBGC), an independent agency of the US government, which provides some pension benefits to workers after their original pension plans have terminated. The PBGC can also seize corporation pension plans that are deemed to be in danger of failing. Private pension plans pay premiums to the PBGC for this protection. The PBGC was created by the 1974 Employee Retirement Income Security Act.
certain proportion of in-state investments generated lower returns than other unconstrained funds.  

The CRF is no exception in targeting certain economic priorities deemed to be important by the state. For example, the CRF deliberately purchases New York-only mortgage pools, which do not benefit from geographical diversification and thus have higher ex-ante risk, to assist New York residents in owning their homes. The fund also invests in mortgages on residences given to low-income and moderate-income New York families at subsidized rents. The CRF also has a special interest in New York commercial real estate. And, money is invested in the New York Business Development Corporation, which makes loans to small businesses with a special interest in businesses owned by women and under-represented minorities. Since 2000, the CRF has run a New York State Private Equity Investment Program, which is designed to provide private equity financing for New York state businesses.  

Private pension plans that are underfunded must have their shortfalls made up by the sponsoring corporation and become liabilities on a company’s balance sheet. In the extreme case, the government, through the Pension Benefit Guaranty Corporation (PBGC) can seize and terminate a private pension plan and in that case, workers have certain benefits paid through the PBGC. There is no such provision if a public pension plan fails. There is also no penalty for underfunding a public pension plan. The accumulation of unfunded pension liabilities can represent a large risk for public plan beneficiaries if governments choose to renege—and certain municipal pension funds have indeed stopped paying beneficiaries (see Appendix B). Furthermore, public pension liabilities do not appear in the public sector accounts as a liability, and this lack of disclosure can make it hard to obtain a true financial position.  

Public pension plans are subject to the same principal-agent problems as corporate pension plans of the self-interest, self-dealing, and corruption of managers, and the misalignment of manager and beneficiary incentives. In addition, there are also principal-agent problems related to the conflicting interests of taxpayers and politicians and the restrictions imposed by the public pension fund being owned by the government. Taxpayers eventually bear responsibility for all liabilities in a public pension plan, including those arising from mismanagement and underperformance whereas politicians do not. Public agencies often face limits on the expertise as the salaries paid to public sector employees are often not competitive, especially for investment professionals, with the private sector. Thus, the most talented investment managers, in general, are not available to public pension plans. The legislative and political process itself can hamper both the management of a public pension fund, as well as proposals for changing benefits, management, valuation procedures, or other aspects of the fund.  

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Pension Fund Governance

Being a sole trustee gives more power than a good comptroller should want and more power than a corrupt comptroller should have.

—Eric Schneiderman, NY Attorney General

The governance model employed by the State of New York—where one person had absolute decision-making authority for the pension fund—is shared by a few other states. In Michigan, North Carolina, and Connecticut, the state pension plans are under also under the complete purview of the state treasurers. This model of corporate governance, where complete authority is invested in a single person, does not, however, occur in large private pension plans. Most large pension plans have a board of directors, a board of trustees, an oversight committee, or some similar structure where a number of people share responsibility for the pension fund.

The governance schemes of some comparable plans, either in size, scope, or aims, are summarized in Appendix C. All of these plans are governed by boards, although they vary greatly with respect to their size, level of expertise, and the scope of their responsibilities. At one end of the spectrum is the Canada Pension Plan, which is governed by a private organization. This 12-person board is comprised exclusively of investment professionals who are appointed for three-year terms and compensated for their services. This professional board approves investment policy decisions, hires the president and CEO, and sets management compensation. On the other hand, many public pension plan boards are comprised exclusively of member organization representatives and publicly elected officials, and do not necessarily possess investment expertise. The nine-person board governing the Ontario Teachers Plan includes representatives appointed by the two sponsor organizations, and a jointly appointed chair. The board of CalPERS, the California Public Employees’ Retirement System, includes representatives of the member organizations, appointees of the governor and state legislature, and a number of state officials. The Ohio Public Employees Retirement System (OPERS) is governed by an 11-person board made up of member group representatives and investment experts. The board is also advised by the Ohio Retirement Study Group, a permanent oversight council which provides advice to the board.

A 2008 paper by the Organisation for Economic Co-operation and Development (OECD) on pension fund governance argues that “some of the more serious cases of governance failures could be solved through a more balanced representation of stakeholders in the governing body, higher levels of expertise (which may be achieved via training or the use of independent trustees) and the implementation of codes of conduct addressing conflicts of interest.”

including Ambachtsheer, Capelle, and Lum (2006) link good governance with good investment performance. They find that the difference in pension fund returns on funds where governance was “good” compared to those funds where governance was “poor” was approximately 1-2% in favor of the well-governed funds.

Over the years, many have advocated that the New York pension system adopt a board, rather than vesting sole power in the hands of the comptroller. In 1989, Governor Mario Cuomo appointed a task force on pension fund investments. Among its findings, the task force recommended a board of trustees comprised of seven members to oversee the CRF.

In 2010, in his gubernatorial campaign, Andrew Cuomo also advocated moving toward a board structure. His campaign literature argued, “A board of trustees will increase checks and balances by increasing the number of people who set policy and review investment decisions; reduce the potentially corrupting influence of politics and political contributions to the comptroller and other elected officials by sharing decision making with trustees who are not directly subject to political campaign pressures; and provide representatives of the members and beneficiaries of the pension fund—the people who are most directly affected by the fund’s performance—with direct input and oversight of investment operations.”

In a 2011 New York Times editorial, former Comptroller Edward Regan argued, “A board of directors would bolster the integrity of New York’s pension fund.” He added,

> The board’s agenda would be vast. It would want to look at the pension system’s accounting and financing. It would have to make comparisons with the pension funds of other states and of corporations. And it would have to analyze federal laws and policies, new pension-fund standards being developed by federal regulators, and the fiduciary duties of both the board and the comptroller.

> A board would add immensely to transparency. Pension increases are granted by elected officials to public employees through the give-and-take of collective bargaining. We need to know if what the employees give up is equivalent to what they gain in pension benefits. Given that politicians naturally seek the votes of union members, their negotiations must occur under public scrutiny.


However, the board system clearly has its own disadvantages. Boards are often slower-moving and can find it more challenging to take decisive action. As the comptroller’s website advocates, “Having one person ultimately responsible for the CRF has enabled comptrollers to act quickly to respond to market changes and to protect the CRF from being raided by past governors.”

23 The decision-making boundaries between board and manager can often be murky. Instances of fraud, conflicts of interest, and poor governance have occurred in board-administered pension funds as well in plans with a sole-trustee model.

Who would serve on the board? Many trustees appointed by politicians, bureaucrats, or unions would not necessarily have investment expertise to effectively review and assess the investment strategy of the CRF. Edward Regan attempted to change the CRF’s governance structure when he was comptroller, and failed. He recalled,

In the 1980s, when I was the comptroller, I proposed legislation calling for a small board of investment experts for the pension fund, representing local governments and active and retired state government workers. Within weeks of its introduction, however, the bill was the subject of amendments intended to grant additional seats to favored interest groups. So I withdrew my support.

The lesson I learned is that the only way to avoid creating a cumbersome board with special interest seats is to spell out in the State Constitution how a pension board would be set up. That would ensure that the membership could not be enlarged, and thereby diluted, and that the comptroller would be made fully accountable to the board.

24 Thus, having a pension board dominated by special interests groups without professional investment knowledge would also likely be a recipe for mismanagement. Finally, some argue that the nonimpairment clause that was added to the New York State Constitution in 1938 and guarantees public employees a contractual right to their pension benefits means that altering the governance structure of the CRF would require an amendment to the New York state constitution.

25 This is, however, disputed by some constitutional law scholars such as Bentley, “Comptroller as Sole Trustee.”
Next Steps

No reform can protect against all forms of fraud, but New York is the only large state in the country that still lets one public official control such a huge pool of investments.

—Editorial, New York Times

With the Hevesi scandal behind them, New York legislators and government officials considered how best to reform the current pension fund governance structure.

Many observers of the New York pension fund system have questioned whether the current governance structure best served the interests of its members. As a New York Times editorial argued, “What the comptroller’s office needs is an independent, financially savvy board of directors to approve the awarding of investment contracts—with the single goal of protecting and increasing state pension assets, invested for more than a million workers and retirees.”

Was a board of directors the answer? What type of governance structure would best protect and serve the pension system’s members? And would this governance system adequately serve the interests of taxpayers, who were the ultimate residual guarantors of the fund?

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26 Editorial, “From Pay-to-Play to Jail.”
27 Editorial, “From Pay-to-Play to Jail.”
Assignment Questions

BENEFITS
1. For a general member in the State Employees’ Retirement System (ERS), document the reduction in benefits from Tier 1 to Tier 5 using Appendix A. Do this by considering a hypothetical case of a person retiring at age 60 with 30 years of service who starts in the ERS system in each tier. In each case, state the retirement benefit in terms of final average salary.

2. How disadvantaged are younger entrants today relative to older workers starting before July 1, 1973?

3. What other schemes could be implemented to be intergenerationally fairer when there are not enough current assets and expected future contributions to meet accrued and future benefits of members?

VALUATION
4. New York’s pension system is currently fully funded if liabilities are measured following actuarial standards. How many other state pension plans, summarized in Exhibit 7, are in this enviable position?

5. Under actuarial standards for public pension plans, the discount rate used to value liabilities of public pension plans is the same as the expected long-term return assumption on assets. Can this assumption be justified? If not, what should the correct discount rate be?

6. Describe how corporate pension plan liabilities are valued. Should public pension plans use the same valuation methodology?

7. If Novy-Marx and Rauh (2010) are correct, and the unfunded liabilities of state pension plans amount to more than $3 trillion, more than three times the amount of publicly traded state debt, what do you think will happen?

8. Look at Exhibit 8 on employer contributions. Why were employer contributions so low during the 1990s and 2000s?

ASSET ALLOCATION AND PERFORMANCE
9. Should a state pension plan, which is a tool of the state, have a wider social role in its investments beyond just maximizing returns for a predetermined level of risk?

10. What role, if any, should equities and other relatively risky assets play in the asset allocation of the CRF?

11. Viewing the member benefits in Appendix A, how much exposure do the liabilities have to inflation? What other economic factors drive the liabilities?

12. The fund has no direct allocation to real bonds (TIPS), but TIPS are held in the fixed income portion of the fund. Should it?

13. The CRF has no direct allocation to emerging market equities or emerging market bonds. Should it?
14. Using various performance metrics, benchmark the returns of the CRF (see Exhibit 4). What is the CRF’s alpha and beta using the S&P 500 as the market return? Compare the CRF’s performance to a 60–40% equity-bond mix. How does the long-run average of the CRF’s returns compare with the actuarial valuation assumptions?

15. Are the CRF’s expenses too high?

GOVERNANCE AND MANAGEMENT
16. Can you create a professional investment culture in a state-owned asset management organization?

17. Describe the different conflicts of interests in having the state be the fund regulator, employer, service provider, trustee, and guarantor all at the same time. Which of these conflicts of interests still exist for corporate pension plans?

18. According to the comptroller’s website, “Having one person ultimately responsible for the CRF has enabled comptrollers to act quickly to respond to market changes and to protect the CRF from being raided by past governors.” How can governors “raid” the CRF and did previous governors do so?


20. Enumerate the advantages and disadvantages of having a board as opposed to the CRF being directly controlled by the comptroller.

21. Suppose a board governance model is selected. How do you select the board members and who should serve on the board? How do you ensure that the board is not unduly swayed by special interest groups, as Comptroller Regan thought was a concern?

22. Proposals for the CRF to have a board structure have been made since the 1980s. Why has a board model not yet been adopted by the NY pension system?

23. Compare and contrast the various board structures of the peer funds outlined in Appendix C. In each case, state the advantages and disadvantages of their governance structures.

24. Are there downsides of requiring all board members to have professional investment expertise?

25. In considering a board model, what decisions should be made at the board level? At the manager level? And at the level of the governor, comptroller, or other high-ranking state officials?

26. How do you benchmark board decisions? How can you benchmark the comptroller’s decisions?

27. What governance structure do you recommend for the CRF?
Appendices

Appendix A

Benefits

As of March 31, 2010 and 2009, the System membership for ERS and PFRS consisted of:

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<th></th>
<th>ERS</th>
<th>PFRS</th>
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<tbody>
<tr>
<td></td>
<td>2010</td>
<td>2009</td>
</tr>
<tr>
<td>Active members</td>
<td>3,029,496</td>
<td>3,020,093</td>
</tr>
<tr>
<td>Inactive members</td>
<td>114,429</td>
<td>113,557</td>
</tr>
<tr>
<td>Total members and benefit recipients</td>
<td>3,143,921</td>
<td>3,133,650</td>
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(a) Membership Tiers

Pension legislation enacted in 1973, 1976, 1981 and 2009 established distinct classes of membership. For convenience, the System uses a tier concept to distinguish these groups, generally:

Tier 1
ERS — Those persons who last became members on or after January 1, 1973, or PFRS — before July 1, 1973.

Tier 2
ERS — Those persons who last became members on or after July 1, 1973, but before July 1, 1976; or PFRS — those persons who became members on or after July 1, 1973, but before July 1, 2009.

Tier 3
ERS — Generally those persons who are State correction officers who last became members on or after July 1, 1973, and all others who last became members on or after July 1, 1976; or PFRS — those persons who became members on or after July 1, 1983, but before January 1, 2010.

Tier 4
ERS — Generally, except for correction officers, those persons who last became members on or after September 1, 1963, but before January 1, 2010.

Tier 5
ERS — Generally those persons who first became members on or after January 1, 2010; or PFRS — those persons who became members on or after January 9, 2010 or were previously PFRS Tier 3 members who elected to become Tier 5.

Vesting
Members who joined the System prior to January 1, 2010 need five years of service to be 100% vested. Members who joined on or after January 1, 2010 (ERS) or January 9, 2010 (PFRS) need ten years of service credit to be 100% vested.

(b) Benefits

(1) Tier 1 and Tier 2
Most Tier 1 and Tier 2 members are in a plan with a minimum retirement age of 55, which provides for 1.67% of final average salary for each year of service less than 20 years. Generally, the benefit with more than 20 years is 2% of final average salary for each year of service. Tier 2 members retiring between ages 55 and 62 with less than 30 years of service receive reduced benefits. As a result of Article 19 of the RSSL, eligible Tier 1 and Tier 2 members, whose date of membership is prior to July 1, 1976, will receive an additional month of service credit for each year of vested service they have at retirement, up to a maximum of 24 months.
(2) Tier 3, 4 and 5 –
Except for Tier 3 and 5 correction officers, generally the benefit is 1.67% of final average salary for each year of service if the service is less than 20 years. For 20 to 30 years of service, the benefit is 2% of final average salary for each year of service. An additional benefit of 1.0% of final average salary is applied for each year of service over 30 years. Tier 3 and 4 members must be age 62 with five years of service or at least age 55 with 30 years of service to retire with full benefits. Reduced retirement benefits are available if retirement occurs between ages 55 and 62. Tier 5 members, with the exception of Uniformed Court Officers and Peace Officers employed by the Unified Court System, must be age 62 with at least 10 years of service to retire with full benefits.

(3) Special Plans –
The 25-Year Plans allow a retirement after 25 years of service with a benefit of one-half of final average salary, and the 20-Year Plans allow a retirement after 20 years of service with a benefit of one-half of final average salary. These plans are available to certain PFRS members, sheriffs, and correction officers.

(4) Ordinary Disability Benefits –
Generally, ordinary disability benefits, usually one-third of salary, are provided after ten years of service; in some cases, they are provided after five years of service.

(5) Accidental Disability Benefits –
For all eligible Tier 1 members and Tier 2 ERS members, the benefit is a pension of 75% of final average salary with offset for any Workers’ Compensation benefits received. For Tier 1 and Tier 2 PFRS members, the benefit is a pension of 75% of final average salary with offset for any Workers’ Compensation benefits received. The Tier 3 and Tier 4 ERS benefit is the ordinary benefit with the years of service eligibility requirement dropped.

(6) Ordinary Death Benefits –
Death benefits are payable upon the death, before retirement, of a member who meets eligibility requirements as set forth by law. The first $50,000 of an ordinary death benefit is paid in the form of group term life insurance. The benefit is generally three times salary. For most members, there is also a reduced post-retirement ordinary death benefit.

(7) Post-Retirement Benefit Increases –
A cost-of-living adjustment is provided to:
(i) all pensioners who have attained age 62 and have been retired for 5 years;
(ii) all pensioners who have attained age 55 and have been retired for 10 years;
(iii) all disability pensioners, regardless of age, who have been retired for five years; and
(iv) ERS recipients of an accidental death benefit, regardless of age, who have been receiving such benefit for five years. This cost of living adjustment is a percentage of the annual retirement benefit of the eligible member as computed on a base benefit amount not to exceed $18,000 of the annual retirement benefit. The cost of living percentage shall be 50% of the annual Consumer Price Index as published by the U.S. Bureau of Labor, but cannot exceed 3%.

Appendix B

Public Pension Valuation

Most public pension plans are defined benefit pension plans, which promise the employee a pension upon retirement. The annual payment depends on the employee’s age, tenure, career salary, and other terms. The pension payments, both current and promised, are contractual liabilities of governments. If there are insufficient funds to meet these liabilities, then taxpayers have to step up, or the state or local government has to reduce benefits, or both.

The valuation of public pension plan liabilities is done by actuaries and involves projecting the future payments from the fund and comparing them to the future inflows to the fund and the current value of the fund assets. The future outflows and inflows depend on various assumptions including salary growth, the growth in employee and employer contributions, inflation (as benefits are often indexed), and mortality and morbidity rates. There are a variety of different funding measures used which differ in how comprehensively the liability is defined.

The narrowest funding measure is the Accumulated Benefit Obligation (ABO). The ABO is the present value of the benefits owed to current employees and retirees if the entire workforce were laid off. The liability under the ABO covers what has been currently earned by employees; this is the pension liability if all workers quit work today, waited until retirement age and collected their benefits, and all present retirees continued to collect their benefits until their deaths. A broader measure is the Projected Benefit Obligation (PBO) which takes into account the future expected salaries of current employees. Even this measure is still conservative as it does not count the future benefits of new hires. Most funding is reported with respect to the ABO.

Economic theories of valuation involve computing future expected cash flows and then discounting these expected cash flows at a risk-adjusted discount rate. In the case of government state pension funds, the “risk” is the level of certainty of whether the future cash flows are to be paid. If public pension plan benefits are risk free, then they should be discounted using a risk-free rate—which should be the treasury yield curve.

Are there circumstances, however, under which the retirement benefits would not be paid? For example, could a state renge on its promises? New York, along with several other states, constitutionally protects pension fund benefits. Article V, Section 7 of the constitution of New York states that, “membership in any pension or retirement system of the state or of a civil division thereof shall be a contractual relationship, the benefits of which shall not be diminished or impaired.” Under its present constitution, New York cannot simply choose to reduce its pension benefits. Thus, ABO pension liabilities rank among the most senior of all unsecured state debt. Thus, financial theory suggests that the appropriate discount rate is a risk-free rate or very close to a risk-free rate.

Actuaries do not use a risk-free rate to value state pension plan liabilities. Under GASB 25 and Actuarial Standards of Practice (ASOP) 27, the discount rate used to value the liabilities is the same.
as the expected long-term return assumption on assets.\textsuperscript{28} This corresponds to a discount rate of approximately 8% for the equity-bond mix typically held by most public pension plans.\textsuperscript{29}

To put into context the problems with this assumption, it is helpful to consider the example of Ang and Green (2011).\textsuperscript{30} Consider Mr. and Mrs. Average with a $250,000 mortgage and $50,000 in net savings all held in Treasury bonds. The couple owes $200,000 to the bank (the liability) and needs access to an income stream with a present value of $200,000 to meet the liability. Now suppose the couple switches their savings from bonds to equities. Their net wealth remains the same ($50,000), and they still owe the bank $200,000. In a correct accounting treatment, the value of what they owe the bank is not dependent on the asset mix they hold; the asset risk is unrelated to the risk of the liability stream.

This is not what happens in public pension funds. If Mr. and Mrs. Average were a public pension fund, switching their net savings from bonds to equities would decrease the stated amount they owe the bank on a financial statement. Because equities have a higher expected return than bonds (which they must have in equilibrium to compensate for the higher risk of equities vs. bonds), a public pension fund actuary would report that the amount they owe the bank would decrease, say from $200,000 to $150,000. Under GASB 25 and AOSP 27, the expected return of their (net) assets has increased, and according to these perverse standards, this reduces the reported liability owed to the bank.

Economically this is incorrect because the risk of equities held by Mr. and Mrs. Average has no relation to the cash flows they owe their bank, despite what their actuary says. Of course, this is just accounting: they still owe the bank $200,000 and have to pay the full present value of $200,000 at some stage. In fact, if they paid only what their accountant says they should pay, $150,000, a bank would eventually foreclose on their house. Thus, by relying on their (erroneous and economically naive) actuary, Mr. and Mrs. Average severely understate their liabilities.

The misleading accounting just described is the accounting used by public pension funds. Using a discount rate of 8% severely understates the liabilities of state and local governments; the true liabilities at a risk-free discount rate are substantially higher than the ABOs reported.

Novy-Marx and Rauh (2009) estimate the underfunding problem of states and municipalities compared to the stated accounting reserves using GASB 25.\textsuperscript{31} They estimate that as of June 2009,

\begin{itemize}
\item \textsuperscript{28} For GASB 25 and AOSP 27 see http://www.gasb.org/st/summary/gstsm25.html and http://actuarialstandardsboard.org/pdf/asops/asop027_109.pdf, respectively.
\item \textsuperscript{29} Pursued to the extreme, states or municipalities would have few unfunded pension liabilities if they held a close to 100\% equity portfolio and, in fact, would have large pension surpluses if they levered an all-equity portfolio.
\item \textsuperscript{31} Novy-Marx and Rauh, “Liabilities and Risks.”
\end{itemize}
states have accrued $5.7 trillion of liabilities to their workers, assuming that states cannot default on their obligations. Assets in state pension plans total less than $2 trillion at the same date and, thus, Novy-Marx and Rauh estimate the underfunding of state pension plans to be approximately $3.2 trillion. In comparison, the outstanding publicly traded debt issued by states is approximately only $1 trillion. The problem is as bad, if not worse, for local municipalities in terms of liabilities-to-revenue comparisons. Examining the largest pension plans of major cities and counties, which cover approximately two-thirds of all local government workers, Novy-Marx and Rauh estimate a total unfunded obligation of $7,000 per municipal household. All of these liabilities are incurred but not reported on state balance sheets. Novy-Marx and Rauh estimate that unfunded pension liabilities work out to over $10,000 for each person in the United States. Already in 2009 some municipal pension plans, such as Prichard AL, started to default and ceased sending pension checks to retired workers.

Appendix C

Governance of Selected Peer Public Pension Funds

The Ohio Public Employees Retirement System (OPERS) had assets of $75.7 billion as of 12/31/10 and nearly 954,000 members. The OPERS fund included a defined benefit pension plan, defined contribution pension plan, and a healthcare fund, and was governed by a 11-person Board of Trustees. Seven of these were representatives of the various employee groups who participated in the system, one was the director of the department of administrative services, and three were investment experts. (One of those investment experts was appointed by the state treasurer, one by the general assembly, and one by the governor.) “The OPERS Board of Trustees appoints the Executive Director, an actuary, and other advisors necessary for the transaction of business….The Board meets monthly and receives no compensation, but is reimbursed for necessary expenses.” The management of OPERS is responsible for the day-to-day activities of OPERS including accounting and control. Additionally, the Ohio state legislature created the Ohio Retirement Study Council in 1968. The purpose of the Ohio Retirement Study Council was to provide oversight of the pension administration system. As the council’s website argued,  

In short, the merits of a permanent pension oversight council, such as Ohio’s, are several. First, pensions are an increasingly complex subject area requiring a degree of expertise and knowledge; once acquired, it should continue to be available. Second, pension laws demand continuous supervision and attention. A single, ill-conceived retirement bill could have serious fiscal consequences that are not fully recognized for many years later. Third, there is

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a need for continuity of policy based on sound pension principles rather than special interests. Change of policy should always be possible, but it should be accompanied by knowledge of the past. Fourth, permanent pension councils can apply consistent policy to the perpetual stream of retirement bills. A great deal of pension law grows by patchwork, yielding in time to favoritism and special interests in the absence of consistent application of sound public policy. Finally, legislative term limits make the establishment of permanent pension councils essential if legislators are to have an independent source of information to help them place retirement issues in the widest possible context of public policy.

The Canada Pension Plan (CPP) Fund was CA$148.2 billion in assets and provided retirement benefits for all Canadians. The CPP Fund was managed by the CPP investment board, which was created by an Act of Parliament in December 1997. This legislation charged the CPP investment board with the following mandate:

To invest in the best interests of CPP contributors and beneficiaries.

To maximize long-term investment returns without undue risk, taking into account the factors that may affect the funding of the Canada Pension Plan and its ability to meet its financial obligations.

To provide cash management services to the Canada Pension Plan so that they can pay benefits. 33

Unlike the oversight boards set up by most other pension funds, the CPP investment board was a private organization comprised of investment professionals. However, the CPP investment board was accountable to the Canadian government and subject to periodic review and examination. The CPP investment board’s members were appointed for a three-year term (with the possibility of reappointment for a maximum of three terms) by the federal finance minister in consultation with the participating provinces. Board members were compensated. The board’s responsibilities included: appointing the auditor, establishing investment policies, monitoring investment decisions, and approving financial statements.

The Ontario Teachers’ Pension Plan had CA$107.5 billion in assets as of 12/31/2010. Established in 1917, the Plan was administered by the Teachers’ Superannuation Commission of Ontario until 1990, when the Ontario government created the Ontario Teachers’ Pension Plan board. The Ontario Teachers’ Pension Plan board was comprised of nine individuals. Four board members were appointed by each of the plan’s two sponsors—the Ontario Teachers’ Federation and the Ontario government. Both sponsors jointly appointed the board’s chair. Board members were appointed for staggered two-year terms and could serve a maximum of four terms. Under the plan’s governance structure, board members were responsible for acting independently of plan sponsors, and making

decisions that best serve the plan beneficiaries. The board was “responsible for the overall management of the fund,” including supervising and reviewing investment strategy and performance. Management and staff “administer the pension plan, invest the pension fund, and pay members and their survivors the benefits promised to them.”

The California Public Employees’ Retirement System (CalPERS) served 1.6 million employees, retirees, and their families and had $231.4 billion in assets as of February 2011. CalPERS was created in 1932 to provide retirement benefits for state employees. In 1939, its membership was expanded to include public agency and classified school employees. And in 1962, CalPERS was further expanded to include the provision of health benefits.

CalPERS was governed by a 13-member board of administration. Six of these members were elected by member organizations, two were appointed by the governor, and one was appointed by the speaker and Senate Rules Committee. The state treasurer, state controller, director of the department of personnel administration, and a member designated by the state personnel board also served on the board. According to the CalPERS website, “The Board of Administration is responsible for the management and control of CalPERS, including the exclusive control of the administration and investment of the Retirement Fund.” “The Executive Staff are committed to administering the direction set by the CalPERS Board and are responsible for day to day operations.” (See Exhibit 9 for selected data of these plans.)

### Exhibit 1

**Largest Pension Funds as of Year-End 2009**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Fund</th>
<th>Country</th>
<th>Total Assets (USD millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Government Pension Investment Fund</td>
<td>Japan</td>
<td>1,315</td>
</tr>
<tr>
<td>2</td>
<td>Government Pension Fund -- Global</td>
<td>Norway</td>
<td>476</td>
</tr>
<tr>
<td>3</td>
<td>ABP</td>
<td>Netherlands</td>
<td>300</td>
</tr>
<tr>
<td>4</td>
<td>National Pension Fund</td>
<td>Korea</td>
<td>235</td>
</tr>
<tr>
<td>5</td>
<td>Thrift Savings Plan</td>
<td>US</td>
<td>234</td>
</tr>
<tr>
<td>6</td>
<td>California Public Employees Retirement System (CalPERS)</td>
<td>US</td>
<td>199</td>
</tr>
<tr>
<td>7</td>
<td>Local Government Officials Pension Fund</td>
<td>Japan</td>
<td>165</td>
</tr>
<tr>
<td>8</td>
<td>California State Teachers Retirement System (CalSTRS)</td>
<td>US</td>
<td>131</td>
</tr>
<tr>
<td>9</td>
<td>New York State Common Retirement Fund</td>
<td>US</td>
<td>126</td>
</tr>
<tr>
<td>10</td>
<td>PFZW</td>
<td>Netherlands</td>
<td>124</td>
</tr>
<tr>
<td>11</td>
<td>Central Provident Fund</td>
<td>Singapore</td>
<td>122</td>
</tr>
<tr>
<td>12</td>
<td>Canada Pension Plan</td>
<td>Canada</td>
<td>122</td>
</tr>
<tr>
<td>13</td>
<td>Florida Retirement System Pension Trust Fund</td>
<td>US</td>
<td>115</td>
</tr>
<tr>
<td>14</td>
<td>National Social Security</td>
<td>China</td>
<td>134</td>
</tr>
<tr>
<td>15</td>
<td>Pension Fund Association</td>
<td>Japan</td>
<td>113</td>
</tr>
<tr>
<td>16</td>
<td>ATP</td>
<td>Denmark</td>
<td>112</td>
</tr>
<tr>
<td>17</td>
<td>New York City Retirement Fund</td>
<td>US</td>
<td>112</td>
</tr>
<tr>
<td>18</td>
<td>GEPF</td>
<td>South Africa</td>
<td>111</td>
</tr>
<tr>
<td>19</td>
<td>Employees Provident Fund</td>
<td>Malaysia</td>
<td>109</td>
</tr>
<tr>
<td>20</td>
<td>General Motors</td>
<td>US</td>
<td>99</td>
</tr>
</tbody>
</table>

## Exhibit 2

### Asset Allocation

**FISCAL YEAR MAR 31, NUMBERS IN THOUSANDS**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term investments</td>
<td>3,086,085</td>
<td>3,826,655</td>
<td>6,443,059</td>
<td>8,551,143</td>
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<tr>
<td>Government bonds</td>
<td>24,105,872</td>
<td>27,025,184</td>
<td>26,096,724</td>
<td>23,712,007</td>
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<tr>
<td>Corporate bonds</td>
<td>962,194</td>
<td>9,516,419</td>
<td>10,474,749</td>
<td>9,824,205</td>
</tr>
<tr>
<td>Domestic equity</td>
<td>51,495,373</td>
<td>34,332,034</td>
<td>58,582,079</td>
<td>65,297,430</td>
</tr>
<tr>
<td>International equity</td>
<td>21,178,608</td>
<td>13,538,962</td>
<td>24,571,663</td>
<td>24,822,250</td>
</tr>
<tr>
<td>Private equity</td>
<td>12,799,735</td>
<td>10,563,694</td>
<td>12,699,376</td>
<td>10,044,806</td>
</tr>
<tr>
<td>Absolute return</td>
<td>3,817,538</td>
<td>2,381,015</td>
<td>5,328,266</td>
<td>4,681,324</td>
</tr>
<tr>
<td>Real estate</td>
<td>6,396,799</td>
<td>7,776,699</td>
<td>9,681,802</td>
<td>7,642,481</td>
</tr>
<tr>
<td><strong>Total Investments</strong></td>
<td><strong>123,842,204</strong></td>
<td><strong>108,960,662</strong></td>
<td><strong>153,877,718</strong></td>
<td><strong>154,575,646</strong></td>
</tr>
</tbody>
</table>

*Source: New York State and Local Retirement System, Comprehensive Annual Financial Reports.*
Exhibit 3a

**Peer Asset Allocation 2009**

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Bonds</td>
<td>27.1%</td>
</tr>
<tr>
<td>Non-US Bonds</td>
<td>1.2%</td>
</tr>
<tr>
<td>Domestic Equity</td>
<td>34.7%</td>
</tr>
<tr>
<td>Non-Domestic Equity</td>
<td>18.2%</td>
</tr>
<tr>
<td>Private Equity</td>
<td>7.4%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>6.5%</td>
</tr>
<tr>
<td>Other</td>
<td>4.9%</td>
</tr>
</tbody>
</table>

100.0%


Exhibit 3b

**Portfolio Allocations of State and Local Government Pension Funds**

## Exhibit 4

### Returns
Fiscal Year Mar 31

<table>
<thead>
<tr>
<th></th>
<th>NYSLRS</th>
<th>Equity</th>
<th>Bonds</th>
<th>Actuarial Investment Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>25.9%</td>
<td>49.8%</td>
<td>7.7%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2009</td>
<td>-26.4%</td>
<td>-38.1%</td>
<td>3.1%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2008</td>
<td>2.6%</td>
<td>-5.1%</td>
<td>7.7%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2007</td>
<td>12.6%</td>
<td>11.8%</td>
<td>6.6%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2006</td>
<td>14.6%</td>
<td>11.7%</td>
<td>2.3%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2005</td>
<td>8.5%</td>
<td>6.7%</td>
<td>1.1%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2004</td>
<td>28.8%</td>
<td>35.1%</td>
<td>5.4%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2003</td>
<td>-10.2%</td>
<td>-24.8%</td>
<td>11.7%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2002</td>
<td>2.8%</td>
<td>0.2%</td>
<td>5.3%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2001</td>
<td>-8.7%</td>
<td>-21.7%</td>
<td>12.5%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2000</td>
<td>17.8%</td>
<td>17.9%</td>
<td>1.9%</td>
<td>8.50%</td>
</tr>
<tr>
<td>1999</td>
<td>8.8%</td>
<td>18.5%</td>
<td>6.5%</td>
<td>8.50%</td>
</tr>
<tr>
<td>1998</td>
<td>30.4%</td>
<td>48.0%</td>
<td>12.0%</td>
<td>8.50%</td>
</tr>
<tr>
<td>1997</td>
<td>10.9%</td>
<td>19.8%</td>
<td>4.9%</td>
<td>8.50%</td>
</tr>
<tr>
<td>1996</td>
<td>21.8%</td>
<td>32.1%</td>
<td>10.8%</td>
<td>8.75%</td>
</tr>
<tr>
<td>1995</td>
<td>8.8%</td>
<td>15.6%</td>
<td>5.0%</td>
<td>8.75%</td>
</tr>
<tr>
<td>1994</td>
<td>6.9%</td>
<td>1.5%</td>
<td>2.4%</td>
<td>8.75%</td>
</tr>
<tr>
<td>1993</td>
<td>12.5%</td>
<td>15.2%</td>
<td>13.3%</td>
<td>8.75%</td>
</tr>
<tr>
<td>1992</td>
<td>10.7%</td>
<td>11.0%</td>
<td>11.4%</td>
<td>8.75%</td>
</tr>
<tr>
<td>1991</td>
<td>11.7%</td>
<td>14.4%</td>
<td>12.9%</td>
<td>8.75%</td>
</tr>
<tr>
<td>1990</td>
<td>13.9%</td>
<td>19.3%</td>
<td>12.3%</td>
<td>8.75%</td>
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<tr>
<td>1989</td>
<td>13.4%</td>
<td>18.1%</td>
<td>5.2%</td>
<td>8.75%</td>
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<tr>
<td>1988</td>
<td>1.6%</td>
<td>-8.3%</td>
<td>4.9%</td>
<td>8.00%</td>
</tr>
<tr>
<td>1987</td>
<td>17.8%</td>
<td>26.2%</td>
<td>8.7%</td>
<td>8.00%</td>
</tr>
<tr>
<td>1986</td>
<td>24.0%</td>
<td>37.7%</td>
<td>28.7%</td>
<td>8.00%</td>
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<tr>
<td>1985</td>
<td>13.7%</td>
<td>18.9%</td>
<td>17.2%</td>
<td>7.50%</td>
</tr>
<tr>
<td>1984</td>
<td>7.9%</td>
<td>8.7%</td>
<td>5.3%</td>
<td>7.50%</td>
</tr>
<tr>
<td>1983</td>
<td>21.4%</td>
<td>44.3%</td>
<td>31.9%</td>
<td>7.50%</td>
</tr>
<tr>
<td>1982</td>
<td>3.3%</td>
<td>-13.1%</td>
<td>9.9%</td>
<td>7.50%</td>
</tr>
<tr>
<td>1981</td>
<td>16.7%</td>
<td>40.1%</td>
<td>13.0%</td>
<td>5.50%</td>
</tr>
</tbody>
</table>

*Sources:* NYSLRS: Annual Report to the Comptroller on Actuarial Assumptions; Equity: S&P 500; Bond: Barcap US Agg.
Exhibit 5

**Investment Expenses**

Fiscal Year Mar 31, numbers in thousands

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment Expenses</td>
<td>364,278</td>
<td>362,748</td>
<td>289,220</td>
<td>174,382</td>
</tr>
<tr>
<td>Total Net Assets</td>
<td>134,251,732</td>
<td>110,937,778</td>
<td>155,845,869</td>
<td>156,625,243</td>
</tr>
<tr>
<td>Expense Ratio</td>
<td>0.27%</td>
<td>0.33%</td>
<td>0.19%</td>
<td>0.11%</td>
</tr>
</tbody>
</table>

*Source: New York State and Local Retirement System, Comprehensive Annual Financial Reports.*

Exhibit 6

**Funding Status**

Fiscal Year Mar 31

<table>
<thead>
<tr>
<th>Year</th>
<th>Accrued Liability</th>
<th>Actuarial Assets</th>
<th>Funding Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>146,733</td>
<td>148,861</td>
<td>101.5%</td>
</tr>
<tr>
<td>2008</td>
<td>141,255</td>
<td>151,683</td>
<td>107.4%</td>
</tr>
<tr>
<td>2007</td>
<td>134,599</td>
<td>142,495</td>
<td>105.9%</td>
</tr>
<tr>
<td>2006</td>
<td>126,638</td>
<td>132,036</td>
<td>104.3%</td>
</tr>
<tr>
<td>2005</td>
<td>120,026</td>
<td>123,745</td>
<td>103.1%</td>
</tr>
</tbody>
</table>

*Note: Combines New York State Employees' Retirement System (ERS) and New York State Police and Fire Retirement System PFRS.*

Exhibit 7

Peer Funding

Distribution of 107 State Pension Systems by FY08 Funding Ratio

Exhibit 8a

Employer Contribution Rates
Fiscal Year Mar 31

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>ERS (%)</td>
<td>16.3</td>
<td>11.9</td>
<td>7.3</td>
<td>8.5</td>
<td>9.6</td>
<td>10.7</td>
</tr>
<tr>
<td>PFRS (%)</td>
<td>21.6</td>
<td>18.2</td>
<td>15.1</td>
<td>15.8</td>
<td>16.6</td>
<td>17.0</td>
</tr>
<tr>
<td>Total Employer Contributions</td>
<td>4.9 billion</td>
<td>3.6 billion</td>
<td>2.3 billion</td>
<td>2.5 billion</td>
<td>2.6 billion</td>
<td>2.7 billion</td>
</tr>
</tbody>
</table>

Source: Annual Report to the Comptroller on Actuarial Assumptions.

Exhibit 8b

Trends in Employer Contributions

### Exhibit 9

#### Peer Governance

<table>
<thead>
<tr>
<th>Fund</th>
<th>Total Assets 12/31/2010</th>
<th>Number of Participants</th>
<th>Number of Representatives on Board</th>
<th>Number of ex-officio members</th>
<th>Number of members with explicit professional experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York State and Local Retirement System</td>
<td>$140.6</td>
<td>1,055,000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Ohio Public Employees Retirement System (OPERS)</td>
<td>$75.7</td>
<td>~950,000</td>
<td>11</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Ontario Teachers Pension Plan (1)</td>
<td>$107.5</td>
<td>363,000</td>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>California Public Employees’ Retirement System (CalPERS)(2)</td>
<td>$231.4</td>
<td>~1,600,000</td>
<td>13</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Canada Pension Plan (CPP)(1) (3)</td>
<td>$148.2</td>
<td>4,400,000</td>
<td>12</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

(1) Canadian dollars. As of 12/31/2010, SUS1 = $CAN 0.99.
(2) Plan assets as of February 24, 2011.
(3) Data for the fiscal year ended 31 March 2011.

*Source:* See Appendix C.