FINAL REPORT OF
THE SPECIAL COMMISSION TO STUDY THE
MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS

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I. Introduction

The Special Commission to Study the Massachusetts Contributory Retirement Systems met ten times between March and October 2009, and its three subcommittees held additional meetings. The process began by conducting an extensive *Background Analysis* that identified the principles underlying an efficient and effective system and compared the current Massachusetts system to that standard as well as to other comparable state systems. From that process, 32 proposals emerged for 1) creating a fairer and more effective retirement system; 2) sharing retirement costs between the employer and employee; 3) improving the funding of the retirement system; and 4) bringing employer contributions for retiree health insurance in line with service.

Rather than vote on individual items, the Commission decided that it would be more advantageous to forward all the proposals as a package to the Legislature and the Governor. Therefore, this *Report* contains the 32 individual proposals together with their rationales. The Legislature plans to hold hearings on the reforms proposed in this *Report*, and that process will allow for a much wider range of voices than represented by the members of the Commission. Having completed its mandate, the Commission welcomes a broader dialogue and the next steps in the process that will lead to the enactment of legislation.

 The Challenge

The Commonwealth of Massachusetts' public employee retirement system provides similar retirement and disability benefit levels as other states with defined benefit plans and no Social Security coverage, and, before the recent financial collapse, the system was on a path toward full funding by 2028.

Yet taxpayers often perceive the retirement system as excessively generous, particularly in the wake of celebrated abuses reported in the press. The public often fails to recognize that public employees are not covered by Social Security and make substantial contributions to their own benefits. Moreover, taxpayers are often unaware that their taxes have been contributing mostly to pay off the system's large unfunded liability, and not to pay for the state's contribution towards the benefits being earned by current workers. In fiscal year 2008, 77 percent of the Commonwealth's $1.3 billion contribution to State and Teachers' pensions went to cover the unfunded liability; only 23 percent went to pay for the normal cost, the cost of benefits earned by current employees in that year.[1]

Public employees and their employers are also concerned about the system. Employees have seen increasing contribution rates for new employees, perceive that some can "game" the system at their expense, and worry that once retired their benefits will be heavily eroded by inflation due to limited cost-of–living adjustments. Employers are concerned about their ability to attract and retain quality employees.

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[1] Commonwealth of Massachusetts Retirement Systems, *Actuarial Valuation Report, January 1, 2008*.

In June 2009, the Massachusetts Legislature passed unanimously and the Governor signed a bill addressing what were viewed as some of the most egregious abuses in the Massachusetts Contributory Retirement Systems. The enactment of these reforms enabled this Commission to concentrate on the fundamental structure of the system.

The Framework Adopted by the Commission

The Commission agreed from the outset that, as a matter of fiscal policy, Massachusetts should continue to oppose Social Security coverage of its public employees, because the costs would exceed the benefits. While Massachusetts employers and employees each would be required to pay 6.2 percent of payroll to Social Security, only three quarters of that amount would pay for benefits; at least one quarter would go to cover Social Security's legacy costs, associated with having provided benefits in excess of contributions to early generations.

The Commission also agreed to retain the defined benefit structure, because it assures participants the most secure source of retirement income. State and local governments can adapt to risky outcomes slowly over time. This adaptive approach spreads risk more widely, and when risks are spread more widely they are less costly to bear. In addition, defined benefit plans put portfolio management in the hands of professionals, thereby circumventing the widespread tendency of individual investors to make basic errors in investment decisions.

Cost neutrality was the standard set by the Chair because the Commission had no information arguing for either an increase or a decrease in the total compensation for public employees. For the purpose of this Commission, cost neutrality has two components: 1) the total normal cost of the system remains unchanged, and 2) the sharing of the normal cost between the Commonwealth and the employee reflects the distribution under current law. So that policymakers in the future can make informed decisions about the appropriate overall level of retirement benefits, the Commonwealth should conduct a study that compares the total compensation of its public sector and private sector employees.

In the context of retaining a defined benefit structure, no Social Security, and cost neutrality, the Commission discussed a number of changes that would improve the fairness and efficiency of the system for new hires and close some remaining loopholes. The Commission also discussed whether some of the provisions for new employees might also be applicable to current employees.

The Commission's discussion went beyond the retirement system to consider retiree health insurance and whether the public employer's contribution to retiree health insurance should vary by years of service. A set of proposals is included that relates to pro-rating employer contributions based on years of service and dedicating some of the savings to pre-funding this important commitment.

To set the stage for the proposals, a brief description of key features of the Massachusetts system follows.

II.   The Massachusetts Contributory Retirement Systems[2]

Massachusetts public employees are covered by a defined benefit pension plan that is administered by 104 local retirement boards, the Massachusetts State Retirement Board, and the Massachusetts Teachers Retirement Board. PERAC oversees all boards, and all the systems are governed by Chapter 32 of the Massachusetts General Laws. As shown in Table 1, the system now includes almost 320,000 active workers and 190,000 retirees.

Table 1. *Participants in Massachusetts Public Employee Contributory Retirement Systems, 2009*

System	Participants		
	Active	Term vested	Retired
State*	86,529	3,663	50,873
Teachers**	89,788		52,107
Local***	142,454	1,250	86,166
Total	318,771	4,913	189,146

Source: PERAC.
* As of 1/1/09.
** Preliminary as of 1/1/09.
*** Based on date of most recent valuation, which varies by system.

GROUPS
The Massachusetts system consists of 4 classes of membership:
Group 1: General employees and teachers;
Group 2: Certain specified hazardous duty positions;
Group 3: State Police;
Group 4: Police officers, firefighters, and other specified hazardous positions.

ELIGIBILITY
A member is eligible for a retirement allowance (service retirement) upon meeting the following conditions:

- completion of 20 years of service; or
- attainment of age 55 if hired prior to 1978, or if classified in Group 4; or
- attainment of age 55 with 10 years of service, if hired after 1978, and if classified in Group 1 or 2.

AMOUNT OF BENEFIT
Retirement benefits are determined by a formula that multiplies the employee's length of service times average salary times a factor that is determined by age at retirement.[3] Average salary is

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[2] For a complete list of benefits, see the PERAC "Massachusetts Public Employee Retirement Guide."
[3] Massachusetts public retirement systems also provide ordinary and accidental disability retirement benefits for employees whose injuries are job-related and are not job-related and keep them from performing their employment duties. Benefits under accidental disability are 72 percent of pay at the time of injury. Benefits under ordinary disability are equal to a superannuation benefit based on service and salary at time of injury, applying the age 55 factor if the employee is under the age of 55.

the average annual rate of regular compensation received during the 3 consecutive years that produce the highest average, or, if greater, during the last three years (whether or not consecutive) preceding retirement.

Group 1 employees receive an accrual rate that ranges from 1.5 percent of final salary at 55 to 2.5 percent at 65, with lower rates should a retiree (with sufficient service) claim before age 55. Group 2 employees reach an accrual rate of 2.5 percent at age 60, and Group 4 employees achieve an accrual rate of 2.5 percent at age 55 (see Table 2). State police have a separate system in Group 3 whereby they receive 75 percent of final pay after 25 years of service.

Table 2. *Benefit Accrual Rates*

Age	Group		
	1	2	4
65	2.5	2.5	2.5
64	2.4	2.5	2.5
…		2.5	2.5
60	2.0	2.5	2.5
59	1.9	2.4	2.5
…	…	…	2.5
55	1.5	2.0	2.5
54	1.4	1.4	2.4
53	1.3	1.3	2.3
…			
41	0.1	0.1	1.1

Source: Commonwealth Actuarial Report, 2005.

DEFERRED VESTED BENEFIT
A participant who has completed 10 or more years of creditable service is eligible for a deferred vested retirement benefit. The participant's accrued benefit is payable commencing at age 55, or the completion of 20 years, or may be deferred until later at the participant's option.

WITHDRAWAL OF CONTRIBUTIONS
Member contributions may be withdrawn upon termination of employment. Employees who first become members on or after January 1, 1984, may receive only limited interest on their contributions if they voluntarily terminate their service. Those who leave service with less than 5 years receive no interest; those who leave service with greater than 5 but less than 10 years receive 50 percent of the interest credited.

TERMINATION BENEFITS
Employees with 20 years of service who are terminated involuntarily are entitled to an allowance equal to 1/3 of the member's 3-year final average salary plus the annuitized balance of the employee's contributions, determined using a 7 percent return.

COST- OF-LIVING ADJUSTMENT
A cost-of-living adjustment (COLA) of up to 3 percent is paid on the first $12,000 of a retiree's total allowance. Thus the maximum COLA is $360 per year.

A member may elect to receive his or her retirement allowance in one of 3 forms of payment.

- Option A: Total annual allowance, payable in monthly installments, commencing at retirement and terminating at the death of the member.
- Option B: A reduced annual allowance payable in monthly installments, commencing at retirement and terminating at the death of the member with potential for lump-sum payment to the designated beneficiary.[4]
- Option C: A reduced annual allowance payable in monthly installments, commencing at retirement and terminating at the death of the member. At the death of the retired employee, 2/3 of the allowance is payable to the designated beneficiary. If the designated beneficiary dies before the member, the payment "pops up" prospectively to the amount payable under Option A.[5]

The Massachusetts system is funded by a combination of employee contributions, investment returns, and state or local funding. Employee contribution rates are based on the dates they joined the system (see Table 3).[6] The rate for new hires has been raised repeatedly so that contribution rates within the system now range from 5 percent to 12 percent, depending on the date of hire.

Table 3. *Contribution Rates in Massachusetts Public Employee Retirement System*

Date of hire	Contribution rate
Pre-1945	0%
1945-74	5%
1975-78	7%
1979-83	7% + 2 % on portion of salary over $30,000
1984-96	8% + 2 % on portion of salary over $30,000
1996 [a] –present	9% + 2 % on portion of salary over $30,000
Teachers who elected "Retirement Plus"	11%
Teachers hired after 7/1/01	11%
State police hired after 7/1/96	12% + 2% on portion of salary over $30,000

a. The increase in rate became effective 7/1/96.
Source: *Commonwealth Actuarial Valuation Report, 2008.*

III.   The Proposals

Most of the proposals presented below were designed for new hires. Both fairness and legal restrictions limit the extent to which changes that may reduce benefits should be applied to current employees. However, as with the 2009 legislation, it may be appropriate to close some

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[4] The lump-sum payment is the amount by which the member's contributions plus interest exceed the annuity payments received.

[5] The designated beneficiary cannot be changed once the member's retirement becomes effective.

[6] The State began to raise the employee contribution rate during the 1970s, but the Supreme Judicial Court ruled that the rate was part of a contract so that rate hikes were limited to new employees. Opinion of the Justices, 364 Mass. 847 (1973).

loopholes and correct badly-designed elements for at least some current employees and these possibilities are presented at the end. For items involving a significant impact, the Chief Actuary has provided cost estimates expressed as a percent of the present value of benefits (PVB).[7] The proposals with significant cost impact should be viewed as implicitly linked by the rule, described above, that proposals be considered on a cost-neutral basis.

BENEFIT DESIGN

1. IMPROVE BENEFITS FOR SHORT SERVICE WORKERS BY REDUCING THE VESTING PERIOD FOR RETIREMENT BENEFITS (BUT NOT FOR RETIREE HEALTH BENEFITS OR EARLY RETIREMENT BENEFITS) FROM 10 YEARS TO 5 YEARS OF MEMBER SERVICE.

Rationale: The existing vesting period of 10 years is longer than that for most other state plans. Shortening the vesting period to 5 years would better serve short service employees – particularly employees who enter public service when they are older.

Impact on cost: 1.0% of PVB ($360 million for the State and Teachers Systems)

2. IMPROVE BENEFITS FOR SHORT-SERVICE WORKERS BY PROVIDING INTEREST EQUAL TO THE ONE-YEAR TREASURY RATE ON ALL WITHDRAWN MEMBER CONTRIBUTIONS.

Rationale: Employees who leave public service with less than five years of service receive a refund of their contributions with no interest. Those who stay between five and ten years receive a small amount of interest, based on 50 percent of the rates paid on individual savings accounts at a sample of at least ten financial institutions. The current rate is 0.6 percent. Providing more substantial interest is important because Massachusetts workers are not accumulating any credits under Social Security while they work for the Commonwealth, and their state pension is not portable when moving outside the system.

Impact on cost: ≤0.1% of PVB ($25 million for the State and Teachers Systems)

3. ENCOURAGE LATER RETIREMENT AND LOWER SYSTEM COST BY REDUCING THE AGE FACTORS BY 0.125 PERCENT RATHER THAN THE CURRENT 0.10 PERCENT. SAMPLE FACTORS FOR GROUP 1 EMPLOYEES WOULD BE 2.5 PERCENT AT AGE 65 (UNCHANGED), 1.875 PERCENT AT AGE 60, AND

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[7] The cost estimates are for new hires, but assume that future hires will have the same demographic information as current members. In other words, the analysis assumes that any provision being considered has been in place for the full career of the current members. The measure of cost for each proposal is the difference in the Present Value of Future Benefits (PVB) with and without the modification. The data come primarily from the State Retirement System (SRS) data and valuation results as of January 1, 2009. Some analysis also used the Massachusetts Teachers' Retirement System (TRS) data and valuation results as of January 1, 2009. In addition, two local system valuations were used for some comparisons. The dollar amounts were estimated for the State and Teachers Systems by applying the PERAC Chief Actuary's percentage changes to the current PVB of the $16.5 trillion for the State System, and $19.7 trillion for the Teachers System. For further details, see "Memorandum on Cost Analysis of Proposals" from James Lamenzo, Actuary to Special Commission (September 23, 2009). A copy of this memorandum can be obtained from James Lamenzo directly (Lamenzo@per.state.ma.us).

1.25 PERCENT AT AGE 55. SIMILAR CHANGES WOULD APPLY TO THE AGE FACTORS FOR GROUP 2 AND GROUP 4 EMPLOYEES.

Rationale: The factors used to determine a member's retirement allowance depend on the member's age at retirement. The reduction in the factors takes into account the fact that when a member retires at a younger age, the retirement benefit will be paid for a longer period of time. The current factors provide a subsidy to those members retiring at younger ages. In other words, the lifetime value of the benefit is greater at younger ages than at older ages. This proposal would reduce, but not eliminate entirely, the subsidy for early retirement.

Impact on cost: -3.7% of PVB ($1.3 billion for State and Teachers Systems)

4. INCREASE THE PERIOD FOR AVERAGING EARNINGS FOR BENEFIT FROM 3 TO 5 YEARS.

Rationale: A slightly longer averaging period reduces the incentive to inflate late career earnings and slightly reduces initial benefits, thereby freeing up resources to help finance a more adequate COLA and interest on contributions for those leaving early.

Impact on cost: -3.8% of PVB ($1.4 billion for State and Teachers Systems)

5. PRO-RATE BENEFITS ACCORDING TO THE NUMBER OF YEARS IN EACH GROUP.

Rationale: Pro-rating may make employees more willing to accept administrative positions towards the end of their careers, will prevent windfalls for people who have only a short period of service in a high group, and will reduce the ongoing pressure to reclassify jobs. Under the proposal, a person who has worked in Group 4 for 25 years and then changes to Group 1 and retires 5 years later with 30 years of service would receive a benefit based on 25 years of service in Group 4 and 5 years of service in Group 1. Alternatively, an employee who has worked in Group 1 for 25 years and then moves into Group 2 and retires in 5 years with 30 years of service would receive a benefit based on 25 years in Group 1 and 5 years in Group 2.

6A. SYSTEMATICALLY REVIEW THE CURRENT CLASSIFICATION OF JOB TITLES AND CLARIFY THE DEFINITIONS FOR BEING IN EACH GROUP.

6B. REDUCE THE NUMBER OF GROUPS. (COMBINE GROUPS 1 AND 2, USING THE BENEFIT RULES FOR GROUP 1.)

Rationale: The Chapter 32 classification system presents a number of problems for retirement boards, the legislature, and participants: 1) Lack of clarity leads to anomalies where people doing very similar jobs fall into different groups; 2) Classifying by job held at retirement, rather than prorating, can give a large payoff to people changing jobs late in their careers; 3) Basing benefits on final job creates a sense of inequity in that retirement benefits do not reflect the whole of the service provided by the employee to the Commonwealth; 4) No mechanism connects the move to a higher group with the need for more revenues into the fund; and 5) Procedures for moving from one group to another are cumbersome and confusing due to the ambiguity of the definitions.

7. TIGHTEN THE CAP ON EARNINGS FOR PURPOSES OF CONTRIBUTIONS AND BENEFITS TO 75 PERCENT OF THE FEDERAL LIMIT ($245,000 IN 2009).

Rationale: Under the defined benefit plan, Massachusetts taxpayers bear the risk of swings in the market when investment returns diverge from the actuarially assumed rate. One result of this arrangement is that those public employees who earn very high salaries shift risk onto the average taxpayer, who has modest earnings. The proposed cap would limit the amount of pension assets that the average taxpayer would have to secure. The 75-percent cap would have been $183,750 in 2009, indexed for inflation thereafter. This cap would have exceeded the income of all but 10 percent of Massachusetts households. High-wage employees would not make contributions on amounts above the cap, allowing retirement saving in a separate account.

8. INTRODUCE AN ANTI-SPIKING RULE, LIMITING THE INCREASE IN PENSIONABLE EARNINGS IN ANY YEAR TO NO MORE THAN 7 PERCENT PLUS INFLATION OF THE AVERAGE OF PENSIONABLE EARNINGS OVER THE PREVIOUS TWO YEARS. THIS PROVISION WOULD NOT APPLY FOR BONA FIDE PROMOTIONS.

Rationale: A pension plan that bases benefits on only a few years of earnings generates a strong incentive for workers to raise earnings in those last years to earn a larger pension than intended by the system. To limit such gaming, many public plans have anti-spiking rules. Among the largest state plans that make up the Center for Retirement Research at Boston College database, 42 percent have anti-spiking provisions. Of the plans for workers not covered by Social Security, 47 percent have anti-spiking provisions.

9. REPLACE THE CURRENT TERMINATION BENEFIT WITH A RULE THAT A TERMINATED WORKER WITH AT LEAST 5 YEARS OF SERVICE IN THE SAME AGENCY OR TYPE OF POSITION RECEIVES 2 MORE YEARS OF SERVICE WHEN RECEIVING A SUPERANNUATION BENEFIT.

Rationale: Currently employees with 20 years of service who are terminated at no fault of their own are entitled to a benefit equal to 1/3 of high three earnings plus an annuity from contributions. In most cases, the lifetime benefit is significantly larger than what the employee would have received if not terminated and declines with further increases in age and service. It is also larger than the superannuation benefit if another job is found, thereby discouraging the search for another covered job. These outcomes do not seem consistent with the goals of the Massachusetts system. Only two other systems (DC Teachers and Montana PERS) widely offer termination benefits. These two plans award the terminated workers either more years of service or consider them to be older; either approach would be preferable to the current arrangement. If the proposal is adopted to add 2 more years of service, the additional years should not exceed the time from termination to the age for full benefits.

10A. CONSTRUCT A REPRESENTATIVE SAMPLE OF EARNINGS HISTORIES TO ENHANCE ANALYSES OF THE ACTUAL WORKINGS OF THE CURRENT SYSTEM AND POTENTIAL CHANGES.

10B. UNDERTAKE A STUDY OF SWITCHING FROM A FINAL AVERAGING PERIOD FOR BENEFITS TO AN INDEXED CAREER AVERAGE.

Rationale: Short averaging periods for public employees have a long history. Before computers, the ability to keep records for more extended calculations was limited. Now it would be administratively feasible to shift to an indexed career average for new hires. The traditional systems have shortcomings in both fairness and incentives that can be avoided in a career average system. The United Kingdom has just switched to an indexed career average for civil servants. The Commission did not have the time or a readily available set of earnings histories for a careful evaluation and comparison of the current system with a career average system.

RETIREMENT SECURITY

11. IMPROVE THE POST-RETIREMENT COST-OF-LIVING ADJUSTMENT (COLA) BY RAISING THE COLA BASE TO $18,000, IN ANNUAL INCREMENTS OF $1,000, SUBJECT TO AVAILABLE FUNDING AND LOCAL ACCEPTANCE.

Rationale: The existing COLA provisions provide up to 3 percent annually applied to the first $12,000 of an eligible retiree's pension, resulting in a maximum COLA of $360 per year. The existing COLA base has been fixed since 1997, resulting in substantial erosion in pension value over time, for current and future retirees alike. If funding permits, this incremental increase in the COLA base constitutes a moderate approach in addressing this problem. For retirement systems, other than the State and Teachers' systems, this proposal is subject to local acceptance.

Impact on cost: 2.6% of PVB for active members ($986 million for State and Teachers Systems)
3.4% of PVB for retired members ($1.1 billion for State and Teachers Systems)

12. INTRODUCE AN OPTION WHEREBY CURRENT EMPLOYEES COULD CHOOSE A LOWER INITIAL BENEFIT IN EXCHANGE FOR A MORE GENEROUS COLA ON A COST-NEUTRAL BASIS.

Rationale: Some current employees may be concerned about the extent to which their future benefits might be eroded by inflation and be willing to trade off a lower initial benefit for more inflation protection. Offering an actuarially equivalent option would not increase system costs but could increase the well-being of some members. To limit gaming based on the latest inflation forecast, this option could be available only to workers at least 5 years from eligibility for retirement. The optional COLA might have a higher initial base or might have a base that is indexed for inflation or some combination.

13. INTRODUCE AN ADDITIONAL ACTUARIALLY EQUIVALENT RETIREMENT BENEFIT OPTION THAT PAYS A CONSTANT PENSION STREAM FOR THE MEMBER AND HIS OR HER SPOUSE.

Rationale: The current system provides various types of annuities for both member and spouse, but it is not clear that these options are well-suited to the needs of all married couples. Many states offer an alternative that provides a constant benefit over the life of the retiree and beneficiary, and it could be developed to be actuarially equivalent to the existing options so as to not increase costs.

14. IMPROVE NOTIFICATION OF MEMBER'S SPOUSE WITH REGARD TO THE ANNUITY OPTION SELECTED BY THE MEMBER BY SENDING AN ADDITIONAL NOTIFICATION LETTER TO A SPOUSE WHO HAS NOT AGREED IN WRITING TO A SINGLE LIFE OPTION.

Rationale: Sending an additional notification letter, if first request for notification is not signed, would help ensure that the member's spouse is informed as to the type of annuity actually going into effect.

15. CLARIFY PENSION FORFEITURE LANGUAGE SO THAT EMPLOYEES DO NOT LOSE PENSION FOR MINOR MISDEMEANORS, BUT PRIMARILY FOR FELONY CONVICTIONS RELATED TO ONE'S EMPLOYMENT.

Rationale: Loss of pension due to a minor misdemeanor seems excessive and causes increased administrative duties to the system.

16. EMPLOYEES MADE INELIGIBLE FOR A PENSION DUE TO FORFEITURE, BUT WHO CONTINUE TO WORK IN PUBLIC SERVICE, SHOULD NOT BE REQUIRED TO CONTRIBUTE TO THE RETIREMENT SYSTEM.

Rationale: If a member has been forced to forfeit his pension, it seems unfair to make that person continue to contribute to the system.

17A. CLARIFY RETIREMENT BOARDS' AND MEMBERS' RIGHTS WHEN BENEFITS BECOME SUBJECT TO THE PENSION FORFEITURE PROVISIONS OF CHAPTER 32.

Rationale: Currently, retirement board practices and interpretations vary regarding their ability to recover pension benefits issued to retirees who are convicted after retirement of an offense related back to their employment. The applicable retirement board should be able to require repayment of benefits received since the effective date of the retirement benefit.

17B. CODIFY THE OPINION OF THE ATTORNEY GENERAL THAT WOULD ALLOW A RETIREMENT BOARD TO WITHHOLD THE PROCESSING OF A PENSION OR OTHER BENEFIT BECAUSE AN INDIVIDUAL HAS BEEN CHARGED WITH AN OFFENSE RELATED TO HIS OR HER EMPLOYMENT.

Rationale: This provision would assist retirement boards in preserving system assets. If a retirement board issues pension payments or a refund of retirement contributions to a member who has been charged with an offense subject to pension forfeiture, it can be placed in the position of having to pursue members to recover such benefits when the member is subsequently convicted of the offense.

18. MEMBERS WHO ARE ELECTED OR APPOINTED FOR A TERM OF YEARS UNDER M.G.L. C. 32 SECTION 5(1)(G) SHOULD BE REQUIRED TO REPAY ANY BENEFITS THEY RECEIVED WITH INTEREST IN ORDER TO REJOIN THE SYSTEM AND WORK FIVE YEARS IN ORDER FOR THEIR BENEFIT TO BE RECALCULATED, CONSISTENT WITH THE PROVISIONS UNDER M.G.L. C. 32 SECTION 105.

Rationale: This change would align the treatment of elected or appointed officials with that of other members.

19. REMOVE THE TEACHERS' PROVISION WAIVING THE HOURS AND COMPENSATION LIMIT FOR THOSE WHO WORK AFTER RETIREMENT.

Rationale: The provision was initially enacted to prepare for a "mass exodus" of teachers under the "Retirement Plus" program. This mass exodus did not occur, and the system is currently providing waivers to about 80 educators per year. Treating teachers differently than other professionals that can be deemed in "critical shortage" status and treating professionals differently than non-professionals that can be deemed in "critical shortage" status creates inequities. Therefore, the provision should be removed.

20. CALCULATE THE EFFECTIVE CONTRIBUTION RATE FOR EMPLOYEES CONTRIBUTING 9 PERCENT PLUS 2 PERCENT ON EARNINGS OVER $30,000 AND INDEX THE $30,000 THRESHOLD.

Rationale: The $30,000 threshold was introduced in the late 1970s and the additional contribution on earnings above this limit was intended to apply only to high earners. As earnings levels have risen, the majority now pay the additional contribution. Therefore, it is important to know how the structure affects the effective rate paid by participants and to consider whether the $30,000 should be indexed so that the structure reflects its original intent.

SYSTEM FINANCING

21. DEFINE THE COMMONWEALTH'S CONTRIBUTION IN TERMS OF A PERCENT OF NORMAL COST SO THAT BOTH THE COMMONWEALTH AND CURRENT EMPLOYEES PAY MORE WHEN NORMAL COST INCREASES, THEREBY REDUCING THE SHIFTING OF THE BURDEN TO NEW EMPLOYEES. THE COMMONWEALTH (AND CITIES, TOWNS AND COUNTIES WOULD CONTINUE TO BE RESPONSIBLE FOR THE UNFUNDED PAST LIABILITY.

Rationale: Of systems without Social Security, Massachusetts has one of the lower normal costs and one of the highest shares of normal cost paid by the employee. Moreover, under current arrangements, changes in normal cost from changes in life expectancy, interest rates, or any legislated improvements fall fully on the government or on future hires through further increases in contribution rates. Thus, workers doing the same job can have different levels of total compensation. Defining the Commonwealth's contribution in terms of a percentage of normal cost would mean that both parties would have to respond to evolving circumstances and could keep contribution rates uniform over employees with different future hire dates and so lead to a more equitable outcome.

Because the Commonwealth's contribution to normal cost is scheduled to decline over time under current law, the above provision is impossible to implement on a cost-neutral basis. An alternative is to apply cost-sharing only for *changes* in normal cost, perhaps restricted to changes arising from legislation.

21′. THE CONTRIBUTION RATE OF EMPLOYEES WILL EQUAL THAT UNDER CURRENT LAW PLUS OR MINUS A SHARE OF ANY CHANGE IN NORMAL COST FOR EACH GROUP. THE COMMONWEALTH (AND CITIES, TOWNS AND COUNTIES) WILL CONTINUE TO BE RESPONSIBLE FOR THE UNFUNDED PAST LIABILITY.

22. REQUIRE MEMBERS RE-ENTERING THE SYSTEM PURCHASING PRIOR CREDITABLE SERVICE, AND THOSE ENTERING THE SYSTEM WHO ARE ELIGIBLE TO PURCHASE CREDITABLE SERVICE BASED ON WORK ELSEWHERE, TO MAKE THAT PURCHASE WITHIN ONE YEAR OR TO PAY THE FULL ACTUARIAL RATE TO COMPENSATE THE SYSTEM FOR NOT HAVING ACCESS TO THEIR FUNDS FOR THE FULL PERIOD.

Rationale: Under existing law, a member re-entering the system or those purchasing service based on activities before pension membership may purchase prior creditable service by paying an amount equal to the accumulated regular deductions withdrawn plus interest or an amount related to earlier employment. However, some members are not required to make such a purchase within a certain period after eligibility to purchase is established. As a result, these purchases often take place immediately prior to retirement. This pattern has the effect of understating the liability associated with the member's service as well as reducing the investable assets of the system.

23. ALTERNATIVELY, REQUIRE MEMBERS RE-ENTERING THE SYSTEM PURCHASING PRIOR CREDITABLE SERVICE, AND THOSE ENTERING THE SYSTEM WHO ARE ELIGIBLE TO PURCHASE CREDITABLE SERVICE BASED ON WORK ELSEWHERE, TO PAY THE FULL ACTUARIAL INTEREST RATE.

Rationale: Under existing law, a member may purchase creditable service for work done elsewhere (for example, teaching in the public school system in another state, Peace Corps) by paying an amount equal to the accumulated regular deductions that would have been paid plus interest. However, the interest rate is 1/2 the actuarial rate. As a result, whenever these purchases take place, the purchase has reduced the ability of the system to finance benefits.

24. MAKE ELIGIBILITY TO PURCHASE CREDITABLE SERVICE BASED ON WORK ELSEWHERE MORE CONSISTENT BY EITHER REDUCING THE CURRENT ABILITY TO PURCHASE (WHERE NOT NEEDED TO ATTRACT QUALITY WORKERS) OR EXTENDING IT TO SIMILAR CLASSES OF WORKERS WHO ARE EQUALLY DIFFICULT TO RECRUIT.

Rationale: The opportunity to purchase creditable years of service is a recruiting tool; the interest rate charged affects the size of recruitment generosity. Currently this opportunity is restricted to particular classes of new hires. It is not clear whether such differences in recruitment incentives are appropriate across positions with similar recruitment patterns.

25. REQUIRE ALL JUDGES TO CONTRIBUTE TO THE SYSTEM.

Rationale: The members of the Supreme Judicial Court do not currently contribute to their benefits. This exception is hard to justify in a contributory retirement system.

26. EXTEND THE CURRENT FUNDING SCHEDULE AND LIMIT THE ABILITY FOR SYSTEMS TO REDUCE FUTURE APPROPRIATIONS UNLESS WELL FUNDED.

Rationale: The recent financial crisis has seriously challenged the ability of Massachusetts public employers to meet the payments required under the current funding schedule. Recent legislation extended the funding deadline from 2028 to 2030. A two-year extension, however, does not provide adequate flexibility for many Massachusetts public employers. In addition, current law has a number of anomalies that require attention. For example, it is silent as to what occurs when the system becomes fully funded and on how to amortize unfunded liability or surplus after 2030.   To provide funding relief and to flesh out guidance, the PERAC Actuarial Advisory Committee recommends a new funding procedure. The new schedule allows for lower funding now, but also requires maintenance of effort when the stock market rebounds.

The unfunded liability will be amortized as follows:
   a. The full funding date will be extended so that the current unfunded liability and any additional amount accumulated over the next ten years will be fully paid off by a fixed date, which is no later than 30 years from the date the legislature allows the funding schedule to be extended, with a cap on the increase in amortization payments of 4 percent a year.
   b. Any *additional* unfunded liability attributed to experienced gains or losses after the initial ten years will be separately amortized within a 20-year period of its occurrence, again with a cap on the increase in amortization payments of 4 percent a year.
   c. In the event of another 2008-type financial crisis, the legislature will determine if the 20-year period should be extended.
   d. If the legislature approves changes, it will specify the period over which the additional unfunded liability will be amortized.

The funding schedule outlined above is subject to the following additional limits if the funding ratio is less than 90 percent:
   a. At the discretion of the Retirement Board, the increase in the appropriation from one fiscal year to the next will be limited to 8 percent.
   b. The appropriation cannot decrease from one fiscal year to the next.
Require an actuarial valuation at least every 2 years and legislative reviews starting in 2015 and every 5 years thereafter.

27. INCREASE RESOURCES FOR SYSTEM ADMINISTRATION.

Rationale: Some of the proposals presented above will require additional record keeping or processing on an ongoing basis. There are further startup costs in changing the record-keeping systems in order to implement changed rules. Moreover, additional resources may be necessary to assemble an adequate sample of complete earnings histories for better analysis of the existing pension benefit determination process and consideration of alternatives.

RETIREE HEALTH INSURANCE

28. PRO-RATE THE EMPLOYER CONTRIBUTION FOR RETIREE HEALTH INSURANCE BASED ON YEARS OF SERVICE. RETIREES WITH 25 YEARS OF SERVICE OR MORE WOULD CONTINUE TO RECEIVE THE FULL CONTRIBUTION FROM THEIR EMPLOYER. THOSE WITH 10 YEARS OF SERVICE WOULD RECEIVE 25 PERCENT OF THE CURRENT CONTRIBUTION. THE SHARE OF THE CONTRIBUTION RECEIVED WOULD INCREASE 5 PERCENT PER YEAR BETWEEN 10 AND 25 YEARS OF SERVICE. THOSE RECEIVING A SUFFICIENTLY DECREASED CONTRIBUTION WOULD BE ELIGIBLE FOR THE HEALTH CONNECTOR, DESPITE THE PRESENCE OF SOME EMPLOYER PROVISION OF RETIREE HEALTH INSURANCE.

Rationale: A general issue arises as to whether all retirees should receive the same level of benefits regardless of how many years of service they have or how many hours per week they have worked. Many other states have delinked retirement and health benefits and pro-rate the retiree health contribution that they make based on years of service, as well as having different vesting rules for cash benefits and health insurance benefits.

29. CONTRIBUTIONS FOR THOSE ON ORDINARY DISABILITY WOULD BE PRO-RATED BASED ON THE YEARS OF SERVICE THEY COULD HAVE ACHIEVED AT THE NORMAL RETIREMENT AGE BUT FOR THE DISABILITY. THOSE ON ACCIDENTAL DISABILITY ARE EXCLUDED FROM THE PRO-RATING SCHEDULE.

Rationale: Disability retirement provides a specific case where the employee is not able to accumulate further service credits. Under the current pension system, disability retirees continue to accumulate service credit while on disability. To align the pension system in terms of fairness to workers with disability, the pro-rating of the employer retiree health care contribution will account for service accrued while on disability.

30. CONTRIBUTIONS FOR RETIREE HEALTH INSURANCE SHOULD BE CHARGED TO EMPLOYING JURISDICTIONS BASED ON THE PORTION OF THE EMPLOYEE'S SERVICE IN EACH JURISDICTION (SIMILAR TO THE PROVISION FOR PENSIONS), WITH EARLIER EMPLOYERS CHARGED BASED ON THEIR OWN CONTRIBUTION RATE OR THE CONTRIBUTION RATE OF THE FINAL EMPLOYER, WHICHEVER IS LOWER.

Rationale: Employees may have spent only a portion of their career in the jurisdiction from which they retire, yet the jurisdiction of final employment is responsible for the full contribution to retiree health insurance. Pro-rating contributions based on time spent in each jurisdiction would allocate the cost more equitably across all the employing entities. Recognizing that jurisdictions pay varying rates toward retiree health insurance, it is recommended that the lower contribution rate should apply for the purposes of the charge-back.

31. RETAIN ELIGIBILITY FOR RETIREE HEALTH INSURANCE AT 10 YEARS OF SERVICE.

Rationale: Contributions for retiree health insurance should be available only to longer service employees. Requiring longer vesting for retiree health insurance than for pension benefits is one

way to achieve that goal. Different vesting periods for retirement benefits and health insurance contributions are common in other states.

32. PROVIDE ONE-HALF OF THE SAVINGS FROM PRO-RATING RETIREE HEALTH INSURANCE CONTRIBUTIONS FOR THE FUNDING OF RETIREE HEALTH INSURANCE. IN ADDITION, THE COMMONWEALTH SHOULD HELP DEVELOP THE TOOLS TO MAKE IT EASIER FOR JURISDICTIONS TO BEGIN FUNDING.

Rationale: Massachusetts currently faces $13 billion in unfunded liabilities for state retiree health insurance. Failure to put money aside for these commitments pushes the burden off to future taxpayers.

APPLYING THE PROPOSALS TO CURRENT MEMBERS

The proposals presented above were assumed to apply only to new hires. Retiree health insurance, however, is not covered by the contract clause, and the proposals could be applied to those who are either not vested or not within 5 years of eligibility. In addition, some of the retirement proposals could be applied to current members or subgroups of current members if the modification were viewed as "*bear[ing] some material relationship to the theory of the pension system and its successful operation, or is necessary to maintain the integrity of the system,*" and not viewed as "*impair[ing] the participants' core of reasonable expectations.*" Proposals that might be applied to current members include:

5. PRO-RATE BENEFITS ACCORDING TO THE NUMBER OF YEARS IN EACH GROUP.

> Implementation would apply only to those changing groups from the date of enactment forward. Members would be assumed to have been in the same group up to date of enactment, unless they choose to provide evidence of having been in a different group in the past.

6A. SYSTEMATICALLY REVIEW THE CURRENT GROUP CLASSIFICATION OF JOB TITLES AND CLARIFY THE DEFINITIONS OF EACH GROUP.

> This provision would not affect the current Group of any employee, but would apply to someone changing jobs if that change involved a change of Group.

8. INTRODUCE AN ANTI-SPIKING RULE.

> This provision would apply only to members younger than age 50 and with less than 15 years of service. Since it would apply only to increases above the bona fide norm, it should not affect a core expectation.

9. REFORM THE CURRENT TERMINATION BENEFIT.

This provision would apply only to members who are not vested. Termination after 20 years without an opportunity to continue in a similar job does not appear to be a core expectation.

12. INTRODUCE AN OPTION WHEREBY CURRENT EMPLOYEES COULD CHOOSE A LOWER INITIAL BENEFIT IN EXCHANGE FOR A MORE GENEROUS COLA ON A COST-NEUTRAL BASIS.

This provision would only be available to members younger than age 50 and with less than 15 years of service who select this option within one year of eligibility.

13. INTRODUCE AN ADDITIONAL ACTUARIALLY EQUIVALENT RETIREMENT BENEFIT OPTION THAT PAYS A CONSTANT PENSION STREAM FOR THE MEMBER AND HIS OR HER SPOUSE.

14. IMPROVE NOTIFICATION OF MEMBER'S SPOUSE WITH REGARD TO THE ANNUITY OPTION SELECTED BY THE MEMBER.

15. CLARIFY PENSION FORFEITURE LANGUAGE SO THAT EMPLOYEES DO NOT LOSE PENSIONS FOR MINOR MISDEMEANORS, BUT PRIMARILY FOR FELONY CONVICTIONS RELATED TO THEIR EMPLOYMENT.

16. EMPLOYEES MADE INELIGIBLE FOR A PENSION DUE TO FORFEITURE, BUT WHO CONTINUE TO WORK IN PUBLIC SERVICE, SHOULD NOT BE REQUIRED TO CONTRIBUTE TO THE RETIREMENT SYSTEM.

17. CLARIFY RETIREMENT BOARDS' AND MEMBERS' RIGHTS WHEN BENEFITS BECOME SUBJECT TO THE PENSION FORFEITURE PROVISIONS OF CHAPTER 32.

18. MEMBERS WHO ARE ELECTED OR APPOINTED FOR A TERM OF YEARS UNDER M.G.L. C. 32 SECTION 5(1)(G) SHOULD BE REQUIRED TO REPAY ANY BENEFITS THEY RECEIVED WITH INTEREST IN ORDER TO REJOIN THE SYSTEM AND WORK FIVE YEARS IN ORDER FOR THEIR BENEFIT TO BE RECALCULATED, CONSISTENT WITH THE PROVISIONS UNDER M.G.L. C. 32 SECTION 105.

19. REMOVE THE TEACHERS' PROVISION WAIVING THE HOURS AND COMPENSATION LIMIT FOR THOSE WHO WORK AFTER RETIREMENT.

22A. REQUIRE MEMBERS RE-ENTERING THE SYSTEM AND PURCHASING PRIOR CREDITABLE SERVICE TO MAKE THAT PURCHASE WITHIN ONE YEAR OF ELIGIBILITY OR TO PAY INTEREST AT THE FULL ACTUARIAL RATE, OR

23A. ALTERNATIVELY, REQUIRE MEMBERS RE-ENTERING THE SYSTEM AND PURCHASING PRIOR CREDITABLE SERVICE TO PAY INTEREST AT THE FULL ACTUARIAL RATE.

Both of these proposals would apply only to current members who have not left yet; those who have left with anticipation of repurchasing on favorable terms would be unaffected. A vested termination, withdrawal of contributions, and re-entry into membership does not appear to be a core expectation.

RETIREE HEALTH INSURANCE

28. PRO-RATE THE EMPLOYER CONTRIBUTION FOR RETIREE HEALTH INSURANCE BASED ON YEARS OF SERVICE.

29. CONTRIBUTIONS FOR THOSE ON ORDINARY DISABILITY WOULD BE PRO-RATED BASED ON THE YEARS OF SERVICE THEY COULD HAVE ACHIEVED AT THE NORMAL RETIREMENT AGE BUT FOR THE DISABILITY. THOSE ON ACCIDENTAL DISABILITY ARE EXCLUDED FROM THE PRO-RATING SCHEDULE.

30. CONTRIBUTIONS FOR RETIREE HEALTH INSURANCE SHOULD BE CHARGED TO EMPLOYING JURISDICTIONS BASED ON THE PORTION OF THE EMPLOYEE'S SERVICE IN EACH JURISDICTION (SIMILAR TO THE PROVISION FOR PENSIONS), WITH EARLIER EMPLOYERS CHARGED BASED ON THEIR OWN CONTRIBUTION RATE OR THE CONTRIBUTION RATE OF THE FINAL EMPLOYER, WHICHEVER IS LOWER.

31. RETAIN ELIGIBILITY FOR RETIREE HEALTH INSURANCE AT 10 YEARS OF SERVICE.

32. PROVIDE ONE-HALF OF THE SAVINGS FROM PRO-RATING RETIREE HEALTH INSURANCE CONTRIBUTIONS FOR THE FUNDING OF RETIREE HEALTH INSURANCE. IN ADDITION, THE COMMONWEALTH SHOULD HELP DEVELOP THE TOOLS TO MAKE IT EASIER FOR JURISDICTIONS TO BEGIN FUNDING.

<center>**Background Analysis[8]**</center>

I. The Challenge

The Commonwealth of Massachusetts' public employee retirement system provides retirement and disability benefits that are similar to other states with defined benefit plans and no Social Security coverage, and, before the recent financial collapse, the system was on a path toward full funding by 2028.

Yet, taxpayers often perceive the retirement system as excessively generous, particularly in the wake of celebrated abuses reported in the press. But the public often fails to recognize that public employees are not covered by Social Security and make substantial contributions to their own benefits. Moreover, taxpayers are often unaware that their taxes are contributing largely to pay off the system's large prior unfunded liability, and not to pay for the benefits of current workers. In fact, for fiscal year 2008, 77 percent of the Commonwealth's $1.3 billion contribution to State and Teachers' pensions went to cover the unfunded liability; only 23 percent was for the normal cost, the cost of benefits earned by current employees in that year.[9]

Public employees and their employers are also concerned about the system. Employees see increasing contribution rates for new employees, perceive that some can "game" the system at their expense, and worry that – once retired – their benefits will lose too much purchasing power due to limited cost-of–living adjustments (COLAs). Employers are concerned about their ability to attract and retain employees.

In June 2009, the Massachusetts Legislature passed unanimously and the Governor signed a bill addressing what were viewed as some of the most egregious abuses in the Massachusetts Contributory Retirement Systems.[10] The enactment of these reforms addressed concerns that would otherwise have been part of this Commission's charge to undertake a comprehensive study of the Massachusetts Contributory Retirement Systems. The Commission therefore addressed the fundamental structure of the system to see if it meets the needs of today's employees and the employing governments, and provides transparency, predictability, and consistency in the calculation, determination, and funding of retirement benefits.

The Commission agreed from the outset that, as a matter of fiscal policy, Massachusetts should continue to oppose Social Security coverage of its public employees. While coverage would eliminate some gaps in insurance protection, the increased costs to the Commonwealth would exceed the benefits received. This discrepancy arises because the Social Security system has legacy costs associated with providing benefits to early generations of retirees in excess of what

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[8] The original version of this Background Analysis was drafted by Alicia H. Munnell, Chair, and Peter A. Diamond. Virtually all members of the Commission or their staff commented on the original draft, and many have commented on a revised draft. Nevertheless, some Commission members may still not agree with every statement in the final document.

[9] Commonwealth of Massachusetts Retirement Systems, *Actuarial Valuation Report, January 1, 2008.*

[10] Chapter 21 of the Acts of 2009, An Act Providing Responsible Reforms in the Pension System.

could be financed by their own contributions. That is, while Massachusetts employers and employees would each be required to pay 6.2 percent of payroll to Social Security, only three quarters of that amount would pay for benefits; at least one quarter would go to cover Social Security's legacy costs.

This document provides background information that was designed to assist the Commission in identifying problems and making recommendations. It begins by reaffirming the commitment to a defined benefit structure. It then lays out principles of fairness and efficiency as criteria against which to evaluate plan provisions and identifies the major policy and financing questions to be resolved.

Four major issues emerge from this review of the contributory retirement system. First, short earnings averaging periods for calculating retirement and disability benefits favor those with rapidly rising earnings profiles, who tend to be high earners, and opens the system to manipulation. Second, the limited COLA means that many older retirees see too large an erosion in the purchasing power of their benefits and are at risk should inflation accelerate. Third, the current classification system involves considerable ambiguity in its definitions and invites "gaming." And finally, the contribution rate for new employees is nearly the highest of any state-administered system, which raises two important issues – how the cost of the pension system should be shared between workers and employers and how to achieve fairness among future new hires who will enter the system at different times.

Beyond the pension system, a question arises as to the equity of providing the same health insurance benefits for retirees regardless of the length of previous employment and the distribution of the burden of that provision, particularly on local governments.

II. Defined Benefit vs. Defined Contribution Plan

Defined benefit plans dominated both the private and state and local sectors in the 1970s. Today they are disappearing in the private sector, but are alive and well in the state and local sector. The reasons for these divergent trajectories include the different nature of the public sector workforce – older, more risk averse, and less mobile; the different nature of the public employer – a perpetual entity facing fewer market pressures; and a different regulatory environment – free from the administrative costs of ERISA and the cost of the Pension Benefit Guaranty Corporation.

Impact on Employees

Defined benefit and defined contribution plans subject the employee to very different types of risk. In the typical public sector defined benefit plan, the employer bears the investment risk during the worker's employment and retirement, longevity risk after retirement, and some of the inflation risk. But employees face 'mobility risk.' That is, under final earnings plans and plans with delayed vesting, workers who leave public service early typically accrue substantially lower benefits than they would have under either defined contribution plans or career-average defined benefit plans.

In defined contribution plans, employees bear all the investment risk during the accumulation phase as well as longevity and inflation risk after retirement, unless they annuitize their balances, in which case they face annuity pricing risk. The employee, and often the employer, contributes a specified percentage of earnings into the account. These contributions are invested, usually at the direction of the employee, mostly in mutual funds consisting of stocks and bonds. Upon retirement, the worker generally receives the balance in the account as a lump sum. One important advantage of these plans is that mobile employees do not lose benefits when they shift jobs as their accumulated assets can move with them.

For long-service employees, defined benefit plans sponsored by perpetual entities such as state and local governments provide a more secure retirement for long-tenured employees than defined contribution plans. And state and local employees tend to have longer tenures than their private sector counterparts. State and local governments can more easily bear investment risk than most individuals because they can adapt to risky outcomes slowly over time. This adaptive approach spreads risk more widely, and when risks are spread more widely they are less costly to bear. In addition, defined benefit plans put portfolio management in the hands of professionals, thereby circumventing the widespread tendency of individual investors to make basic errors in investment decisions.

Impact on Costs

Despite the advantages of a defined benefit plan, critics sometimes suggest that introducing a defined contribution plan could save the state money. In fact, *for any given level of benefits*, administrative expenses make defined contribution plans more expensive than defined benefit plans (see Figure 1). The freedom from private sector regulatory costs and the economies of scale achieved by large state pension funds has kept the cost of administering these plans very low. According to the U.S. Census of Governments, the weighted average administrative cost (including cost of administration and investment management) for the nation's public defined benefit plans is 0.3 percent of assets. Defined contribution plans maintain individual accounts and typically update these accounts daily. In addition, most defined contribution plans use mutual funds or similar instruments as investment options and, as a result, have costs that average 0.9 percent of assets.

Figure 1. *Administrative Expenses as a Percent of Assets by Type of Plan, 2006*
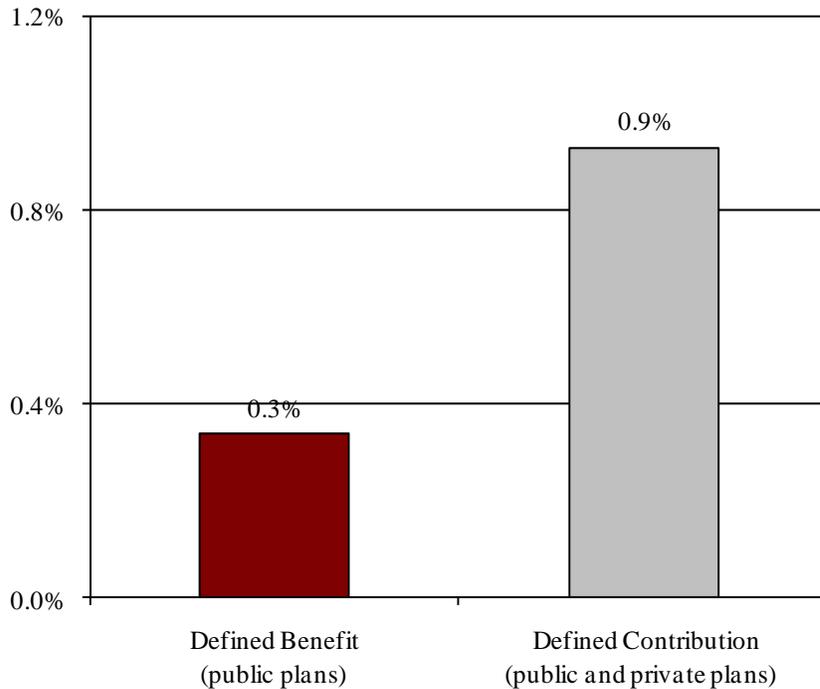
Sources: U.S. Census Bureau (2006) and Investment Company Institute (2009).

Even if aggregate costs increased, taxpayers could hope for relief if by switching to a defined contribution plan they could transfer the burden of future accruals under the new plan from the government employer to the individual employee. After all, transferring the contribution burden to the employee provided a major economic incentive to move from defined benefit to 401(k) plans in the private sector. But such an outcome would be difficult to achieve in the public sector where employee contributions to defined benefit pensions are already high.

Finally, in the debate over retirement plans, supporters of defined contribution plans often use the magnitude of the unfunded liabilities to highlight the need to shift to a defined contribution plan. The reality, however, is that, even with a switch to a new defined contribution plan, the public employer must still cover the cost of accrued benefits from past service and of continuing accrual for workers currently in the existing defined benefit plan. Public employees have considerable legal protection against any reduction in their expected benefits or any increase in required contributions. Thus, even if the introduction of a new plan – either defined benefit or defined contribution – reduces pension costs going forward, such a step does nothing to solve the current funding problem.

In short, it is absolutely clear that *for a given level of protection* a defined benefit plan is cheaper.

III. Principles

Beyond providing an adequate level of retirement benefits in return for the service of its employees, several principles should guide the construction of any retirement system. First, the system should be fair and its rules understandable – workers in similar positions with similar work histories should receive similar benefits. Excessively generous benefits for some will raise public criticism and create an incentive for others to lobby for better treatment. Similarly, dramatically different ratios of benefits to contributions are hard to justify. This outcome can arise when newly hired workers, who pay higher contribution rates, and older workers, who pay much lower contributions, are doing the same job and receiving similar benefits. Dramatically different benefit-to-contribution ratios can also occur when a worker receives a large increase in earnings in the three-year window before retirement.

Efficiency is another important principle. The pension is part of the system of incentives that influences recruitment, retention, and retirement decisions, and thereby the willingness of employees to move across jobs within and outside the employment covered by the pension system. The goal to "retain" means encouraging employment within the system when workers have acquired skills and abilities that the Commonwealth particularly values. Thus, the pension system should not unduly encourage early departures. At the same time, it should not foster continued employment at a job with the Commonwealth when moving to other employment or retirement makes sense for the Commonwealth and the worker together. Efficiency also encompasses the sharing of risks between workers and employers.

Reducing the need for frequent legislation is also a desirable goal of pension design.[11] The legislative process can be slow and the outcomes uncertain and not always well-designed, making properly designed automatic adjustments more attractive. For example, automatic indexation gives retirees predictability in how their pensions will adapt to changing circumstances, much greater predictability than relying on repeated legislation. Moreover, if legislated increases in benefits are not accompanied by legislated provision of funds, the degree of actuarial funding of the pension system will decline, increasing the cost to future taxpayers. Social security systems around the world rely heavily on automatic indexing. In the United States, a wage index is used to update earlier earnings when calculating average earnings, a key step in determining initial benefits. And a full COLA offsets inflation after age 62.[12] Another form of indexing used in some countries (but not US Social Security) is to adjust for increases in life expectancy at retirement age. Examples, in quite different forms, include Sweden and

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[11] The ability of the Commonwealth to lower the value of pensions is limited by the court's interpretation of the contractual nature of the pension system for current employees, although some changes are likely to be allowed and no such restriction applies to future hires. The Commonwealth can increase benefits, as has happened from time to time in the past.

[12] The approach taken in France and Germany is equivalent to wage indexing in both the calculation of initial benefits and the adjustment of benefits in payment. Finland uses a weighted average of prices and wages, with different weights before and after retirement. In a recent reform of its pension system for civil servants, the United Kingdom closed its final salary pension plans to civil service workers hired after July 30, 2007 and introduced a career average revalued earnings plan (Novus) with full inflation indexing in both the determination of initial benefits and the adjustment of benefits in payment. This plan is an option along with a defined contribution alternative with mandatory annuitization.

Germany. Some additional automatic indexing in Massachusetts may be able to play a useful role, as discussed below.

The principles outlined above have implications for the financing and the provision of benefits under the retirement system.

IV. The Financing of the Massachusetts System

Massachusetts public employees are covered by a defined benefit pension plan that is administered by 104 local retirement boards, the Massachusetts State Retirement Board, and the Massachusetts Teachers Retirement Board. The Public Employee Retirement Administration Commission (PERAC) is responsible for the regulation and oversight of all boards and all the systems are governed by Chapter 32 of the Massachusetts General Laws. As shown in Table 1, the system now includes almost 320,000 active workers and almost 190,000 retirees.

Table 1. *Participants in Massachusetts Public Employee Retirement System, 2009*

System	Participants		
	Active	Terminated Vested	Retired
State*	86,529	3,663	50,873
Teachers**	89,788	NA	52,107
Local***	142,454	1,250	86,166
Total	318,771	4,913	189,146

Source: PERAC.
* As of 1/1/09.
** Preliminary as of 1/1/09.
*** Based on date of most recent valuation, which varies by system.

Contribution Rates

The Massachusetts system is funded by a combination of employee contributions, investment returns, and state or local funding. Employee contribution rates are based on the dates they joined the system (see Table 2).[13] The rate for new hires has been raised repeatedly so that contribution rates within the system now range from 5 percent to 12 percent of pay, depending on the date of hire.

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[13] The State began to raise the employee contribution rate during the 1970s, but the Supreme Judicial Court ruled that the rate was part of a contract so that rate hikes were limited to new employees. Opinion of the Justices, 364 Mass. 847 (1973).

Table 2. *Contribution Rates in Massachusetts Public Employee Retirement System*

Date of hire	Contribution rate
Pre-1945	0%
1945-74	5%
1975-78	7%
1979-83	7% + 2 % on portion of salary over $30,000
1984-96	8% + 2 % on portion of salary over $30,000
1996-present[a]	9% + 2 % on portion of salary over $30,000
Teachers who elected "Retirement Plus"	11%
Teachers hired after 7/1/01	11%
State police hired after 7/1/96	12% + 2% on portion of salary over $30,000

[a]The new contribution rate applied to employees hired as of 7/1/1996
Source: *Commonwealth Actuarial Valuation Report, 2008*.

Massachusetts contribution rates for new employees are high relative to other plans. This pattern is to be expected given that Massachusetts public employees are not covered by Social Security and therefore require a larger pension than public employees in states where Social Security benefits serve as the basic retirement income. But the notable fact is that among plans without Social Security the Massachusetts plans are among the highest in terms of employee contribution and the lowest in terms of normal cost (see Table 3).[14]

Table 3. *Employee Contribution Rates among State Plans without Social Security Coverage*

Plan name	Employee contribution [a]	Total normal cost	Employee contribution as a percent of total normal cost
Alaska PERS	6.8%	10.3%	65.9%
Alaska Teachers	8.7	11.5	75.4
California Teachers	8.0	17.3	46.3
Colorado Municipal	8.0	13.7	58.5
Colorado School	8.0	14.0	57.1
Colorado State	8.0	13.9	57.6
Connecticut Teachers	6.0	10.4	57.7
District of Columbia Teachers	8.0	10.0	80.0
District of Columbia Police and Fire	8.0	25.7	31.1
Illinois Teachers	9.4	18.7	50.4
Illinois Universities	8.0	18.8	42.7
Kentucky Teachers[b]	7.6	13.5	56.7
Louisiana SERS[c]	8.0	9.7	82.5
Louisiana Teachers	8.0	15.4	52.1
Maine Local[d]	6.5	Varies	Varies
Maine State and Teacher	7.7	13.2	58.1

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[14] A rigorous comparison of contribution rates across states would involve examining the assumptions used in determining normal costs, and estimates of total compensation would be relevant for analyzing contribution rates.

Massachusetts SERS[e]	9.0	12.2	73.8
Massachusetts Teachers	11.0	11.6	94.8
Missouri Teachers	13.0	21.7	59.9
Nevada Police and Fire	17.3	30.2	57.2
Nevada Regular Employees	10.5	17.0	61.8
Ohio PERS	10.0	14.9	67.2
Ohio Police & Fire	10.0	22.1	45.3
Ohio School Employees	10.0	14.1	71.0
Ohio Teachers	10.0	14.8	67.5
Texas Teachers	6.4	10.4	61.4

[a]The reported employee contribution percentages pertain to general employees hired as of the date of the most current annual reports and benefit handbooks and does not reflect the average contribution rates of current employees.
[b]For University Employees. Non-University employees contribute 9.105 percent and the total normal cost is 17.11 percent.
[c]Louisiana SERS employees hired prior to 2006 contribute 7.5 percent with a total normal cost of 15.6 percent in 2008.
[d]Pertains to Regular AC & AN Employees of Maine. Normal costs vary by locality.
[e]Massachusetts SERS employees contribute 9 percent plus an additional 2 percent for the portion of their salary above $30,000.
Sources: The Center for Retirement Research at Boston College *State and Local Public Pension Survey*; Survey of various annual reports and benefit handbooks.

Table 3 reports on contributions of the most recently hired workers. Since contribution rates have risen with date of hire, the current average contribution in Massachusetts is below the figures in the table. On average, in 2006 those in Group 1 were projected to pay for 74 percent of their retirement benefits, and the average across all groups is projected was 68 percent (see Table 4). The assertion is frequently made that for some new hires, their contributions will more than cover their pension benefits according to actuarial calculations.[15] These calculations assume a safe rate of interest of 8 percent, which is unlikely to be achieved by the workers without the Commonwealth absorbing all of the risk of the investment portfolio. That is, the actuarial calculation looks at expected contributions and expenditures and does not recognize any cost to bearing risk. Using a lower interest rate, more comparable to what individuals could earn on their own with safe investments, and thus attributing to the employers the cost of bearing portfolio risk in line with standard financial economics, would considerably reduce the measure of the share that employees pay for their benefits.

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[15] This is likely to occur for some Group 1 employees who are contributing at the 9 plus 2 percent rate and who do not retire with a disability benefit, according to James R. Lamenzo, PERAC, Actuary.

Table 4. *Employee Contributions as a Percent of Total Normal Cost for the State Retirement System as of January 1, 2006*

Group	Total normal cost	Expected employee contributions	Employer normal cost	Employee contributions as a percent of total normal cost
Group 1	11.2%	8.3%	2.9%	74.1%
Group 2	12.7	8.1	4.6	63.8
Group 3	21.2	8.6	12.6	40.6
Group 4	19.8	8.9	10.9	44.9
All	12.3	8.3	4.0	67.5

Note: Teachers, who are included in Group 1, have a normal cost of 11.61 percent and an employee contribution rate of 9.65 percent, which means the employee share of the total normal cost is 83.1 percent.
Source: James R. Lamenzo, PERAC, Actuary

Looking beyond Massachusetts, public employees generally are covered by Social Security and also make contributions to their public employer's plan. Employees and employers in both the public and private sectors who are covered by Social Security make payments of 6.2 percent for retirement, survivor, and disability benefits (up to the maximum taxable earnings of $106,800 for 2009). In the private sector, the share of retirement contributions paid by employees depends on the nature of their pension coverage. Roughly half of private employees at any moment in time are also covered by an employer-sponsored plan. Nearly two-thirds of employees with coverage participate in a 401(k) plan, where typically the employee contributes 6 percent and the employer makes a 3-percent matching contribution.[16] The other one-third with coverage participates in a defined benefit plan where the employer is responsible for funding and the employee makes no contribution. Given the variation in coverage and the different types of plans, comparisons between private sector and public sector employees depend on the particular situation.

Three issues arise when assessing the current financing of the Massachusetts pension system: (i) How should the anticipated costs of a cohort of workers be shared between the workers and the Commonwealth?; (ii) How should the sharing change over time as normal costs change after a worker has been hired?; and (iii) How should the contribution rates change as new cohorts of workers are hired, cohorts who are likely to have longer life expectancies and therefore more costly pensions as long as the pension system makes no adjustments directly for life expectancy?

Under current arrangements, normal costs not covered by employee contributions are paid by the Commonwealth and other government entities, and the Commonwealth and cities, towns and counties make payments to amortize the unfunded liability. Changes in normal cost from changes in life expectancy, interest rates, or any legislated improvements in secondary benefits for current employees fall fully on the government or on future hires in the form of legislated higher contribution rates. In some instances, benefit improvements have been introduced as an option for current employees subject to additional contributions.[17] Under the current arrangement, where pay is related to the employee's job and the contribution rate related to the

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[16] The most common match in a 401(k) plan is 50 percent of the employee's contribution up to 6 percent of earnings, which produces an effective employer match rate of 3 percent of earnings. See Profit Sharing/401(k) Council of America, *48th Annual Survey of Profit Sharing and 401(k) Plans* (2005).

[17] For example, when "Retirement Plus" was introduced for teachers, the contribution rate for new hires no longer excluded the first $30,000 of earnings from the 2 percent additional contribution cap. Current employees could opt into Retirement Plus if they paid at least 5 years of contributions at the higher rate.

employee's date of hire, workers doing the same job can have very different levels of total compensation. Selecting a suitable degree of sharing of the normal cost of pensions between employer and employee could keep contribution rates uniform over employees with different future hire dates and so lead to a more equitable outcome.

Instead of setting a concrete contribution rate for new hires, one option might be to set the share of normal costs to be paid by the Commonwealth and the employees. Such an arrangement would mean that both parties would have to respond to evolving circumstances. For example, in 2006 employees covered under the State Retirement System paid roughly 68 percent and the Commonwealth pays 32 percent of normal cost (see Table 4). Assume for the moment, that this existing ratio is the desired target. The question then is what happens when the normal cost for a cohort of workers increases? Under such a scheme, the Commonwealth would pick up 32 percent of the additional cost and the public employees 68 percent.[18] Of course, any such arrangement would require new legislation.

Then the question is whether a 68/32 split is fair. To answer that question requires two pieces of information: (i) How does the compensation of workers in the public sector compare to that of their private sector counterparts? and (ii) Does the Commonwealth want to pay more, less, or the same in total compensation as the private sector? Assume that the Commonwealth wants to pay the same as the private sector for a given type of job. To oversimplify, if we knew that public sector workers were paid one half what their private sector counterparts earned, then, if cash wages are not adjusted, the equitable ratio would be 100 percent for the Commonwealth and zero percent for public employees. On the other hand, if public sector workers were paid twice their private sector counterparts and if cash wages are not adjusted, then they probably should pay 100 percent of the normal cost and the Commonwealth zero. Thus, it may be useful for the Commonwealth to request a comparative study on public versus private sector compensation to inform a determination of how pension costs should be distributed between employees and the employing entity, a determination that might accompany a review of the other elements in total compensation.[19]

Since it has been deemed desirable to have different pension systems for police and firefighters than the rest of employees, the question arises whether a consistent cost sharing across categories is appropriate. If police and fire paid the same percent of the total normal cost as the other groups, their absolute contribution would be higher because the total normal costs of their pensions are greater. To date, the Commonwealth has contributed a greater share to the pensions of police and fire than to other public employees.

In all cases, the burden of amortizing the unfunded liability from past service should be spread broadly among taxpayers and not borne by today's public employees. The amortization schedule determines how this burden is allocated across taxpayers in different years.

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[18] A slightly more complex option, but one that would represent less of a break from current practice, is to have the sharing of changes in normal costs apply only to future changes.

[19] Legislated changes in the pension system would not have to wait for the result of such a study; a level of rate and sharing could be established and then adjusted for new hires once the results were available.

Impact of the Financial Crisis

Prior to the financial crisis, the Massachusetts systems generally were on their way to fully funding their pension liabilities by 2028.[20] In 2008, assets were 89 percent of liabilities for the State Employees system and 74 percent for the Teachers Retirement System. These ratios put Massachusetts in the middle of the pack of state-administered plans in terms of funding. Funding ratios at the local level varied significantly across the Commonwealth.

The recent financial crisis has seriously challenged the ability of Massachusetts' public employers to meet the payments required under the current funding schedule when the impact of the 2008 investment losses are reflected.[21] Recent legislation extended the funding deadline from 2028 to 2030. A two-year extension, however, does not provide adequate flexibility for many Massachusetts public employers. In addition, current law has a number of anomalies that require attention. For example, it is silent as to what occurs when the system becomes fully funded and on how to amortize unfunded liabilities or surpluses after 2030.

To provide funding relief and to flesh out guidance, the PERAC Actuarial Advisory Committee recommends a new funding procedure. The new schedule allows for lower funding now, but also requires maintenance of effort when the stock market rebounds. This requirement provides symmetry. Plan sponsors are not being asked to put more money into the pension exactly when they cannot afford it, but also they will not be able to reduce future appropriations when stock values increase. Below is a summary of the PERAC recommendations:

The unfunded liability will be amortized as follows:
   e. The full funding date will be extended so that the current unfunded liability and any additional amount accumulated over the next ten years will be fully paid off by a fixed date, which is no later than 30 years from the date the legislature allows the funding schedule to be extended, with a cap on the increase in amortization payments of 4 percent a year.
   f. Any *additional* unfunded liability attributed to experienced gains or losses after the initial ten years will be separately amortized within a 20-year period of its occurrence, again with a cap on the increase in amortization payments of 4 percent a year.

The funding schedule outlined above is subject to the following additional limits if the funding ratio is less than 90 percent:
   c. At the discretion of the Retirement Board, the increase in the appropriation from one fiscal year to the next will be limited to 8 percent.
   d. The appropriation cannot decrease from one fiscal year to the next.

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[20] The funding requirements in Chapter 32 were established in 1987 and initially required that each system be fully funded by June 30, 2028, 40 years after the implementation of the law.
[21] The following discussion is drawn from PERAC Actuarial Advisory Committee (2009).

V.   Retirement Benefits Provided by the Massachusetts System[22]

"Recruit, retain, and provide retirement income to quality workers" nicely summarizes the goals of the Massachusetts retirement system.[23] Workers are concerned with having adequate retirement income, and so appreciate having a pension as part of compensation for their work. A pension serves as a commitment device that helps employees save for retirement and allows them to take advantage of the favorable tax treatment afforded pensions under the federal personal income tax. By being part of a defined benefit pension system, participants do not bear the risks of fluctuating asset values and do not need to make investment decisions (for this portion of their retirement incomes), which can require expertise they may not have. Participants also receive their benefits as an annuity and can avoid the risks and costs of seeking out private market annuities or failing to annuitize when they should.

It is generally agreed that retirees need roughly 70 to 80 percent of previous earnings in initial benefits in order to maintain the standard of living to which they may have become accustomed. The need is less than 100 percent because retirees no longer need to save for retirement and can use their considerable additional time to provide themselves services that they had previously purchased. In their later years, however, many often need to purchase services – cooking dinner, paying bills, shopping etc – that they had provided themselves their whole lives. The "standard of living to which they may have become accustomed" is not an employee's earnings during the final period prior to retirement, but rather a measure of the consumption they could have been financing with the salary earned over a somewhat extended period leading up to retirement. Maintaining this standard of living during retirement requires some degree of cost-of-living adjustments.

Most public employees do not spend their entire careers in public employment.[24] Some enter at young ages and then leave for other jobs after a period of years; others work in the private sector and enter public employment mid-career. For workers leaving employment with the Commonwealth before ending work (and so having the continuing ability to save for retirement), the contribution to retirement income needs to be put in a context with additional savings. And for those entering later in their career, their ability to have saved for retirement before employment as a public employee needs to be taken into account.

A member may begin receiving benefits after completion of 20 years of service or after age 55. Workers in Groups 1 and 2 hired after 1978 must have at least ten years of service to retire at age 55.

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[22] For a complete list of benefits, see the PERAC "Massachusetts Public Employee Retirement Guide."

[23] Letter to Representatives Kaufman and Dorcena Forry from Joan Schloss, Executive Director of the Massachusetts Teachers' Retirement Board, dated January 21, 2009.

[24] In analysis based on the retirement of state employees between 1991 and 1995, Ellen Bruce found that only 11 percent of retirees had 30 or more years of service and 72 percent left prior to vesting (Bruce, 1997).

The determination of benefits paid to a new retiree in a year is the result of a multi-step process. The steps are:

A.	Calculate average earnings
B.	Classify the retiree for benefit determination
C.	Determine the benefit accrual rate for normal retirements
D.	Determine eligibility for termination benefits
E.	Apply a benefit limit, if relevant
F.	Adjust for type of annuity
G.	Consider vesting, withdrawals, deferred benefits, and buybacks

A. Average Earnings

The calculation of average earnings requires three decisions:[25] (i) What to include in earnings? (ii) How many years of earnings to count?; and (iii) What adjustments, if any, to make to earlier earnings in order to reflect rising wages and prices over time?; Note that none of these decisions need affect the overall level of benefits because the benefit accrual rate can be adjusted to offset any change in average earnings.

What to include in earnings? The recent legislation redefines "regular compensation" to specifically exclude certain monetary benefits like housing, lodging, travel, automobile usage or annuities for the purposes of a pension benefit calculation. This change is one that we applaud. Similarly, no rationale exists for including accumulated unused sick or vacation days, and these forms of compensation are not included in average earnings under Chapter 32.

How many years of earnings to count in determining the average? Massachusetts currently uses 3 years, which is consistent with the 3-5 years widely used by other state systems. A short averaging period has the advantage of limited record keeping and producing an earnings base that reflects resources available near retirement. But a short averaging period also: i) benefits those with the most rapidly rising earnings trajectories, who tend to be the higher paid (see Figure 2); ii) exposes employees to the risk that expected earnings growth in those last few years does not materialize; and creates an incentive to manipulate earnings in the last years.[26] On the other hand, the longer the averaging period, the less the base resembles earnings towards the end of life. However, wage or price indexing can bring early years more in line with later ones without reintroducing the potential for manipulation.

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[25] A somewhat lesser issue is the question of whether to use highest years, last years, or highest consecutive years. Massachusetts uses the higher of the highest three consecutive or the last three, whether or not consecutive. An advantage of using highest years is that workers who would like to reduce their work load, at the price of lower pay, may choose easier, lower-paid jobs without damaging their pension benefit levels as much. Using consecutive years has advantages and disadvantages relative to highest years in trying to be representative of overall earnings. On the one hand, a scattering of higher-paid temporary assignments over a career might give an unrepresentative picture of overall earnings. Conversely, the use of consecutive years can severely penalize someone taking a furlough or temporary assignment that is not part of the pension system and can make a worker reluctant to take such a furlough or temporary assignment when it might be desirable.

[26] Such an outcome could occur if expected general pay increases do not materialize or an expected promotion does not happen.

Figure 2. *The Ratio of Contributions to Benefits by Wage Growth, 8-Percent and 4-Percent Discount Rate*
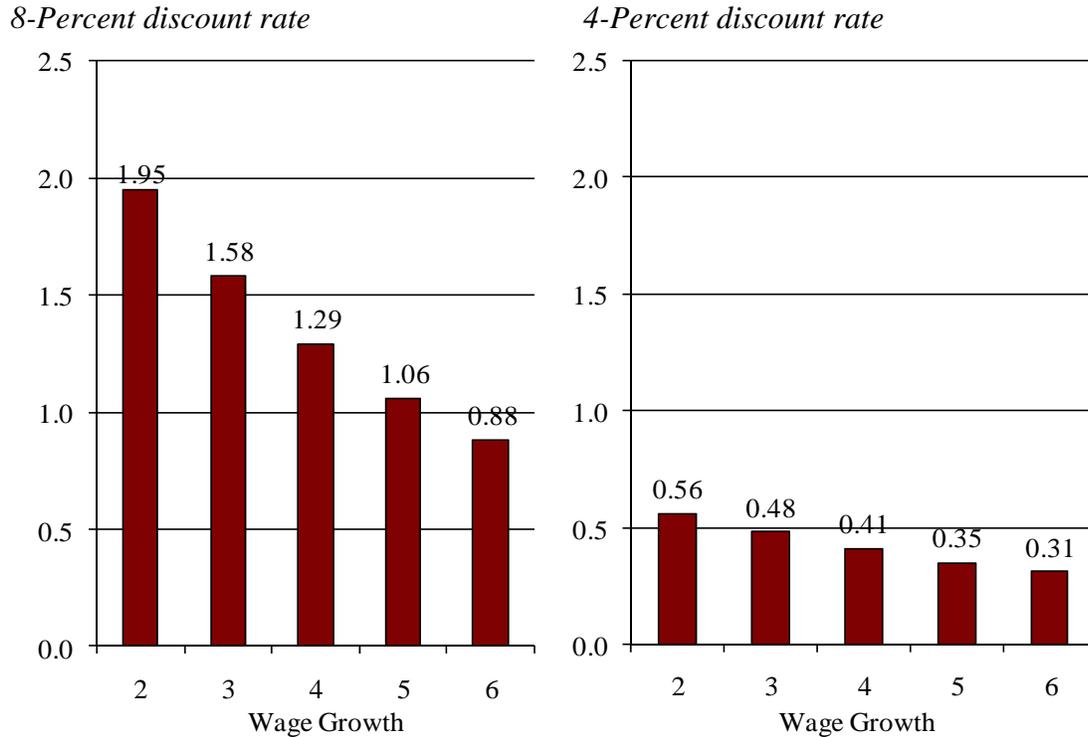
8-Percent discount rate

4-Percent discount rate

Source: Preliminary estimates by Peter A. Diamond. Results to be reviewed by James Lamenzo, Chief Actuary, PERAC.
Note: Workers are assumed to work from age 25-65.

This report uses both 8-percent and 4-percent discount rates when considering the accumulated value of worker contributions and the expected present discounted value of pension benefits. An 8-percent rate is a typical rate used in actuarial analyses of the finances of a pension system and reflects the expected return on the portfolio of assets used to help finance pensions. A calculation using an 8-percent rate can be thought of as the expected cost to the Commonwealth of providing a particular benefit.[27] A separate issue is how much it costs workers to make contributions over their working lives. For this calculation, it is appropriate to recognize that workers do not have the opportunity to earn a safe rate of return of 8 percent if they invest directly. Using a 4-percent return then measures the value of safe alternatives for workers and also for retirees. So calculations using the two different discount rates are suggestive of how the system works from the cost perspectives of the Commonwealth and the worker.

In short, moving away from a very short averaging period has distinct advantages. Five years, ten years, and career average are possible candidates. If the averaging period were lengthened

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[27] An assumed rate of 8-percent does not recognize the riskiness in the returns on assets held in pension funds. The current financial crisis has driven home that the higher expected return associated with equity investment comes with a high level of risk. Stock returns have been extremely low for extended periods. For example, from 1965 to 1979 the return on stocks was only 5 percent.

significantly, indexing of annual earnings before averaging should also be done, in contrast with the current practice of averaging nominal dollars

How to adjust earlier earnings to reflect rising wages and prices over time? The U.S. Social Security system adjusts previous earnings with a wage index. [28] Other national systems use a weighted average of wages and prices. More simply, one can use just a price index as is done by the Nuvos system which has recently been created for new hires of UK civil servants.

Anti-Spiking Provisions

In order to protect against potential abuse, 45 of the 108 largest state-administered plans currently have anti-spiking laws in place. These provisions limit the increases in annual salary applicable when calculating the pension benefit. Some states simply have language that prohibits unusual payments in the years just prior to retirement, but 27 plans have percentage limits on the annual increases that can be considered for calculating final average salary. These anti-spiking provisions vary, with limits on annual salary growth of 5 to 20 percent, with a median of 10 percent (see Appendix Table A1). [29]

B. Classification

The Commonwealth's retirement system is defined by four different classes of employees. [30] When originally created, these classes were based on the then current understanding of life expectancy of employees in different professions.

Group 1: Officials and general employees
Group 2: Employees with job titles presumably reflecting hazardous duties
Group 3: State police officers
Group 4: Fire fighters, police officers, and some correction officers

The current classification has a rationale shared by many systems in the country in that it separates general employees from employees in positions that carry greater physical challenges. However, the Chapter 32 enumeration of those covered under the different classes belies the rather straightforward justification for the four groups. As a result, the classification system presents a number of problems for retirement boards, the legislature, and participants: i) Lack of clarity leads to anomalies where people doing very similar jobs fall into different groups; ii) Classifying by job held at retirement, rather than pro-rating based on years employed in each group, can give a large payoff to people changing jobs late in their careers; iii) Basing benefits

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[28] Since the Social Security benefit formula is progressive, indexing break points to average wages and using a wage index roughly preserves the distribution of replacement rates, which would not happen with price indexing in both places. The Massachusetts benefit formula is linear, so this issue does not arise.

[29] While such nominal limits control manipulation, they also put employees at risk if inflation were to accelerate. A better formulation might be some rate of real wage growth, such as 2 percent plus inflation.

[30] Although technically in Group 1, teachers hired after 2001 and those hired prior to 2001 that opted-in are covered under the Retirement Plus Plan. Under Retirement Plus, retirement benefits for participating members with at least 30 years of service are increased by 2 percent for each full year of creditable service in excess of 24 years, up to the statutory maximum of 80 percent. The contribution rate for Retirement Plus participants is set at a flat 11 percent.

on final job creates a sense of inequity in that retirement benefits do not reflect the whole of the service provided by the employee to the Commonwealth; iv) No mechanism connects the move to a higher group with the need for more revenues into the fund; and v) Procedures for moving from one group to another are cumbersome and confusing due to the ambiguity of the definitions.

In 2006, The Blue Ribbon Panel made the following recommendations, which we modify in *italics* for greater clarity:
- The system should have only two groups:
  - Given the enormous improvements in health, life expectancy, and education, most Massachusetts employees should be able to work productively until age 65. *Workers should be able to retire earlier or later than this age, with a suitable adjustment of pension benefits.*
  - An earlier retirement age should be available for Fire, Police, and those Corrections Officers whose jobs involve significant daily physical exertion AND, given the skills required for their jobs and the numbers of such workers, are unlikely to find suitable alternative employment in the public or private sector.

- Benefits should be pro-rated over the number of years in each group. This change may make people more willing to accept administrative positions after having been *in a job covered by pensions for police and fire*, and it will prevent windfalls for people who have only short service in the higher *benefit* group.

- *Reclassification requests may arise despite the clarity of the distinction.* Amend Chapter 32 to require that individual reclassification requests be filed with the employee's retirement board. Individuals dissatisfied with the board's classification should be able to appeal to the Contributory Retirement Appeal Board (CRAB) and if dissatisfied should follow the established appeal process. No individual requests for reclassification should be entertained by the legislature.

- All requests to the legislature for group reclassifications should be accompanied by a price tag that shows the impact of the reclassification on the retirement system's unfunded liability.[31]

- When groups of employees petition the legislature to change their classifications, the Public Service Committee should require an opinion of the affected retirement board as to the appropriate classification and a justification for the change based on the criteria set out for each group.

- The criteria for movement to *the Police and Fire* Group should be based on job responsibilities – not job title.

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[31] Increases in the unfunded liability due to reclassification should be amortized over three years rather than over the remainder of the funding period. In addition, a system should be established for charging any costs related to reclassification of workers back to the employing entity.

- o The basis for classification to this group should be: (i) the daily physical exertion of the job makes it impossible to safely and effectively carry out the functions beyond a certain age, AND (ii) given the skills required for their jobs and the numbers of such employees, workers with these responsibilities are unlikely to find suitable alternative employment in the public or private sector.
  - o Training, certification, and exposure to hazardous substances should be reflected in compensation, NOT in movement to a higher group.

- Earlier ages for full pensions should be reflected in higher contribution rates. An explicit decision should be made of how those higher contribution rates should be divided between employee and employer. Thus, employee contributions should no longer be based on date of hire as under current law.

The 2006 Blue Ribbon Panel concluded that, whether the number of groups is reduced or not, a thorough review and clarification of the Chapter 32 rules is required for allocating workers to different groups.

C. Benefit Rates

Retirement benefits are determined by a formula that multiplies the employee's years of service times the average of his highest three years of earnings times a factor that is determined by age at retirement.[32] Group 1 employees receive an accrual rate that ranges from 1.5 percent of final salary at 55 to 2.5 percent at 65, with lower rates should a retiree (with sufficient service) claim before age 55. Group 2 employees reach an accrual rate of 2.5 percent at age 60, and Group 4 employees achieve an accrual rate of 2.5 percent at age 55 (see Table 5). State police have a separate system in Group 3 whereby they receive 75 percent of final pay after 25 years of service.

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[32] Massachusetts public retirement systems also provide accidental and ordinary disability retirement benefits for employees whose injuries are job-related as well as those that are unrelated to their job and keep them from performing their employment duties. Benefits under ordinary disability are equal to a superannuation benefit based on service and salary at time of injury, applying the age 55 factor if the employee is under age 55. Benefits under accidental disability are 72 percent of pay at the time of injury.

Table 5. *Benefit Accrual Rates*

Age	Group		
	1	2	4
65	2.5	2.5	2.5
64	2.4	2.5	2.5
…		2.5	2.5
60	2.0	2.5	2.5
59	1.9	2.4	2.5
…	…	…	2.5
55	1.5	2.0	2.5
54	1.4	1.4	2.4
53	1.3	1.3	2.3
…			
41	0.1	0.1	1.1

Source: Commonwealth Actuarial Report, 2005.

Massachusetts is unusual in expressing benefit rates as factors that vary by age. Most other state-administered systems apply the same factor regardless of age (see Table 6) and then adjust explicitly for taking benefits early. The two approaches, however, are equivalent. Massachusetts simply does the multiplication, reducing the benefit factor to reflect the longer expected retirement period.

Table 6. *Distribution of the Largest State Plans, by Type of Accrual Rate*

Type of accrual rate	Number of plans		
	Total	With Social Security	Without Social Security
Constant accrual rate	82	68	14
Accrual rate varies by service	21	13	8
Accrual rate varies by age	4	1	3

Note: Accrual rates are for general employees hired as of the most current annual report.
Sources: Center for Retirement Research at Boston College *State and Local Public Pension Survey*; Survey of various annual reports and benefit handbooks.

D. Termination Benefits

Section 10 of Chapter 32 has special provisions for employees with 20 years of service who are terminated involuntarily. The termination allowance is calculated as 1/3 of the member's 3-year final salary plus the annuitized balance of the employee's contributions, determined using a 7-percent return. For a typical worker, the 1/3 rule determines the bulk of the benefit, which is typically somewhat more than 40 percent of the final average salary. The June 2009 legislation

eliminated termination benefits for public employees who are terminated through failed re-election, or nomination.[33]

The rationale for the termination benefits for general public employees is straightforward. Benefits are back-loaded in part to encourage continued work. But the incentive to continue work is not relevant for someone who was terminated. Some individuals planning a career in public service may be terminated through no fault of their own and end up with relatively little in the way of pension benefits, especially since they are not covered by Social Security. For example, under rules for superannuation benefits, a person in Group 1 entering at age 29 who is terminated at 49 would be entitled to a pension of 18 percent (0.9 x 20 years) of high-three salary. Similarly, someone who entered at 32 and was terminated at 52 would be entitled to a benefit of 24 percent (1.2 x 20 years).[34] In each case, the termination benefit would boost that amount to one third plus the annuity.

While the case exists for some type of termination benefit, the pattern resulting from the current structure produces some anomalies. The dashed lines in Figure 3 report the present discounted value of termination benefits for a worker with a typical earnings trajectory who began employment at age 25 and was terminated at different ages. The solid lines show the superannuation benefits for the same worker who departs voluntarily and claims his benefit at the age of separation or age 55, whichever is later. Two patterns are evident. First, termination benefits are high relative to superannuation benefits, particularly at younger ages. For example, the value of the termination benefit is 3.5 times the superannuation benefit when claimed at age 45. Second, the lifetime values of termination benefits are lower for people who claim them later, despite the fact that they have worked longer.

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[33] Prior to the recent legislation, those in appointed positions and elected officials were also vested for normal retirement benefits at age 55 after 6 years of service. The Pension Reform bill extended the required service from 6 to 10 years, to align with the majority of employees for the state.

[34] Terminated workers can defer the start of superannuation benefits to increase the monthly benefit level.

Figure 3. *Present Discounted Value of Lifetime Retirement and Termination Benefits for Typical Public Employee, at 8-percent and 4-percent Discount Rate, in Thousands*
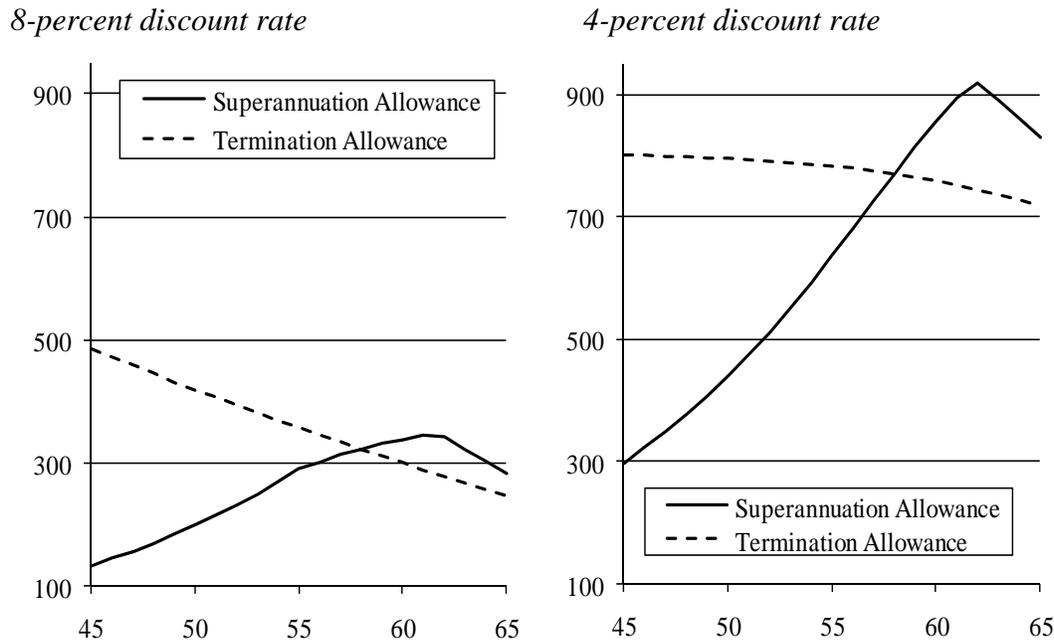
8-percent discount rate　　　　　　　　*4-percent discount rate*

Source: Preliminary estimates by Peter A. Diamond. Results to be reviewed by James Lamenzo, Chief Actuary, PERAC.
Note: Workers are assumed to start work at age 25.

If the 1/3 portion of the termination benefit were reduced, or the annuity were not added to the benefit, the termination benefit would be smaller, but it would still have some unsatisfactory properties. While the superannuation benefit is larger for a retiree with more years of service (age and earnings held constant) and for an older worker (years of service and earnings held constant), neither pattern holds for the one-third rule. [35]

From the perspective of providing adequate income at ages when most people fully retire, the early start in termination benefits is probably not as valuable as a sufficiently larger benefit starting later, but the one-third portion of the termination benefit does not include an increased monthly amount for a delayed start.

An examination of the member handbooks of the 107 largest state retirement systems outside of Massachusetts revealed only two other major plans that provide widely applicable involuntary termination benefits – Montana and the District of Columbia Teachers Retirement Plan. [36] The DC Teachers Plan gives workers over age 55 the same benefit as if they were 60 and eligible for the retirement benefit. [37] The Montana Public Employees' Retirement System allows terminated workers to buy up to three additional years of service with the employer paying part of the cost. Both of these approaches appear to have better properties than the current 1/3 rule. Allowing

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[35] The first pattern holds until the 80 percent maximum binds; the second holds until age 65 for a retiree in Group 1.
[36] Some workers in Virginia have a termination benefit that removes the early retirement reduction for involuntarily terminated workers claiming prior to the normal retirement age.
[37] Workers under age 55 receive a .167 percent reduction in their retirement benefit for every month prior to age 55.

purchase of three additional years of service would permit terminated workers with 20 years of service to have a 15 percent larger benefit than they would receive without the special treatment. Similarly, adding two years to a worker's age would allow a terminated worker claiming benefits at age 53 to receive the 15.4 percent larger superannuation benefit than a worker at age 55.[38]

E. Benefit Limits

Currently, the amount determined by the benefit formula cannot exceed 80 percent of the member's highest three-year average salary. Since the benefit formula multiplies average earnings by years of service and the benefit rate, this limit is equivalent to a constraint on the number of years of creditable service that can count for the benefit formula when retiring at any given age.[39]   With rates at the highest ages of 2.5 percent (and 3 percent for those in Group 3), this amounts to a limit of 32 years (27 for those in Group 3 where a maximum benefit of 75 percent of earnings is used in the calculation). More than half of other state plans have similar limits, although some of them have Deferred Retirement Option Program ("DROP") accounts so that a worker continuing in covered employment does not face as large a financial impact from reaching the limit.

F. Type of Annuity

Retirees currently have three benefit options at retirement:
- Option A: Total annual allowance, payable in monthly installments, commencing at retirement and terminating at the death of the member.
- Option B: A reduced annual allowance payable in monthly installments, commencing at retirement and terminating at the death of the member with potential for lump-sum payment to the designated beneficiary.[40]
- Option C: A reduced annual allowance payable in monthly installments, commencing at retirement and terminating at the death of the member. At the death of the retired employee, 2/3 of the allowance is payable to the designated beneficiary. If the designated beneficiary dies before the member, the payment "pops up" prospectively to the amount payable under Option A.[41]

Although these options provide various types of protection for both member and spouse, it is not clear that these options are well-suited to the needs of all married couples. For example, a member selecting Option B who lived long enough to receive payments in excess of contributions plus interest would leave nothing for his or her spouse. Option C provides the peculiar pattern that if the member survives he gets a larger benefit than the spouse, who receives 2/3 of the reduced amount. Thus, the pop-up, while possibly serving to encourage selection of Option C, does not seem to provide benefits when most needed.

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[38] The benefit provided under this approach is worth somewhat less than in percentage terms to an older terminated worker, which may be appropriate as the older worker probably anticipated fewer years of further employment.
[39] This rule is supplemented by limits on earnings for workers who start retirement benefits and also do consulting work within the framework of the pension system.
[40] The lump-sum payment is the amount by which the member's contributions plus interest exceed the annuity payments received.
[41] The designated beneficiary cannot be changed once the member's retirement become effective.

In correspondence, the Massachusetts Organization of State Engineers and Scientists (MOSES) urged the Commission to add an Option that would provide a constant benefit over the lives of the retiree and beneficiary.[42] Many states offer such an alternative, and it could be developed to be actuarially equivalent to the existing options so as to not increase costs. The Commission might want to consider this option and perhaps its role as the default.

At present a married member's form choosing one of the options must be signed by the member's spouse. If the married member files an unsigned form, the retirement board must send the spouse notification within 15 days. After a maximum 45 days, an unacknowledged Option form goes into effect. Thus, a spouse not signing a form does not limit the member's choice. While some states have only notification rules, as is effectively the case in Massachusetts, some others require a spousal notarized signature for a single life option and some mandate some joint life protection (see Table 7). Protecting the spouses of public employees in Massachusetts is particularly important in that many may have little or no protection under Social Security, which provides both spousal and widow's benefits.

Table 7. *Post-Retirement Survivor Benefits and Rights among the Largest State Plans*

| | | Plans in States | |
| | | with Social Security | without Social Security |
Survival benefit type	Total plans		
Mandatory joint-and-survivor	3	3	0
Default joint-and-survivor requiring spousal consent to opt-out	20	14	6
Spousal consent necessary for all benefit payment options	8	7	1
Spousal notification necessary for all benefit payment options	7	3	4
No specific provisions	70	55	15

Source: Center for Retirement Research at Boston College survey of various annual reports and benefit handbooks.

G. Vesting, Withdrawals, Deferred Benefits, and Buy-backs

For workers employed for only part of their careers in public employment, a good retirement system should make a reasonable contribution to retirement income. Massachusetts' 10-year vesting requirement means that many workers leave public service with little more than their own contributions.[43] In addition, crediting service on a pro-rata basis, as Massachusetts does, means that part-time workers may not be vested for 20 years. The current vesting provisions

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[42] Letter to Chairwoman Munnell from Joe Dorant, President of Massachusetts Organization of State Engineers and Scientists (MOSES), and Chris Breshahan, Chairman of MOSES Ad-hoc Committee on Pension reform.
[43] Employees who leave public service with less than five years of service receive a refund of their contributions with no interest. Those who stay between five and ten years receive 50 percent of the interest credited on their contributions, with an interest rate based on the rate paid on savings accounts. An employee who is removed or discharged will receive interest regardless of years of service.

raise three questions: (i) Is ten years the appropriate vesting period?; (ii) If a long vesting is appropriate, what should workers who leave before vesting receive when they leave?; and (iii) How should vesting be determined for part-time workers? The tradeoff, of course, is that for any given level of expenditure, the more money that goes to workers who leave early, the less is available for those staying longer and collecting benefits. The Commonwealth may want to attract individuals who may not turn into long-service employees.

The vesting requirement in Massachusetts is longer than the 5-year cliff vesting required for private sector defined benefit plans under ERISA and for federal employees under the new Federal Employee Retirement System FERS (see Table 8). Moreover, in the private sector, part-time workers with at least 1,000 hours of work in a given year are provided a full year of credit toward vesting and, therefore, would vest in five years as well. A 10-year vesting period is also on the high end of vesting for major state and local plans (See Figure 4). Thus, more rapid vesting and crediting 1,000 hours of employment as one year of service may merit consideration.[44]

Table 8. *ERISA and FERS Vesting Rules*

	Cliff Vesting	Graduated Vesting
ERISA	5	3(20%) - 7(100%)
FERS	5	

Sources: U.S. Department of Labor (2006); U.S. Office of Personnel Management (1998).

Figure 4. *State Pension Plans by Vesting Period*
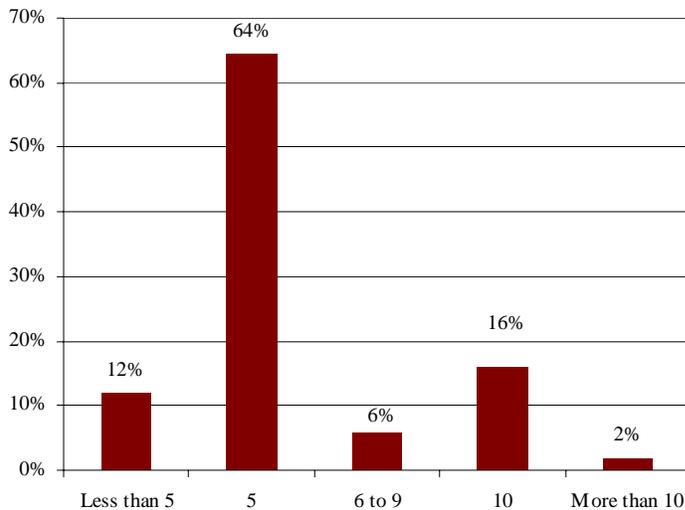
Note: Based on 101 of largest state pension plans.
Source: Center for Retirement Research at Boston College survey of various annual reports and benefit handbooks.

Whether or not Massachusetts decides to retain a 10-year vesting period, some thought should be given to what workers who leave early receive or could receive on a deferred basis when they

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[44] A shortening of the vesting period, while of no consequence with lifetime averaging for benefit calculation would have the potential for some anomalies with a ten-year averaging period and a vesting period less than ten years. While rules could be designed to address this issue, it would be a further complication of the benefit rules.

reach full retirement age. This issue is particularly important since these workers are not accumulating any credits under Social Security while they work for the Commonwealth. Employees who leave public service with less than five years of service receive a refund of their contributions with no interest. Those who stay between five and ten years receive interest based on the rates paid on individual savings accounts at a sample of at least ten financial institutions. Comparisons with the private sector defined benefit plans are not possible since they are not contributory. Under the old federal Civil Service Retirement System, where workers are not covered by Social Security, regular contributions covering between one and five years of service earn interest at 3 percent, and since 1985 voluntary contributions beyond the normal required deduction earn interest based on the average yield on new investments purchased by the Fund during the previous year. Under the new Federal Employees Retirement System, where workers are covered by Social Security and may not make voluntary contributions beyond the normal deduction, employees who leave with at least one year of service receive their contributions plus interest – again based on the average yield on new investments purchased by the Fund.

In the Massachusetts system, those who are vested (at least 10 years of service) but not yet eligible for a benefit (less than 20 years service and under age 55) may withdraw their contributions with full interest (set at a rate typical for a savings account) or receive a deferred benefit. The size of the benefit rate depends on the age at which the member claims his retirement benefit. The average earnings to which the benefit rate is applied are not adjusted for inflation between termination and the start of benefits. As a result, the real value of the future benefit declines as prices increase. This decline in value, due to lack of indexing, is widely seen as inhibiting labor mobility for those covered by a defined benefit pension. If workers do leave and opt for the deferred benefit, they have a great incentive to return to covered employment when nearing benefit eligibility age, since after three years of service they can apply their previous service credits to an updated average earnings basis.

For those who take their money out of the system, "creditable service" bills allow members of the retirement system to "buy back" years of service if they return later. Those who buy back creditable service generally pay the amount into the system that would have been deducted at the time of their employment plus "buy-back interest." The interest is half the actuarially assumed interest rate, which varies by system in Massachusetts. For former employees, who have withdrawn their money from the retirement system and return to state service, some buy-back provision makes sense, but the appropriate rate of interest merits consideration. For employees whose previous service was not with the state, bills have given groups or individuals creditable service for time in the Peace Corps, out-of-state teaching, or other activities. Some of these bills are to reward or encourage certain activities, while others may be part of recruiting particular classes of workers; all of them increase the demands on the retirement funds. Additionally, varying rules apply to employee eligibility for certain types of service "buy back" that lack clear justification. For example, school superintendents are able to purchase out-of-state credit, but not town managers.

VI. Cost-of-living Adjustments

Even moderate levels of inflation will erode the purchasing power of retirement benefits over time. As shown in Figure 5, without any COLA, 3-percent inflation will cut the purchasing power value of a benefit received at age 55 in half by age 80.   In recognition of this problem, Social Security adjusts benefits fully for inflation after retirement. Social Security, however, is not intended to provide an adequate retirement income, but merely to serve as a foundation for pensions and other saving. Outside Social Security, the level of inflation protection varies. Under FERS, federal government employees receive essentially CPI minus1 percent;[45] most state and local plans provide some inflation adjustment; while indexing in the private sector is virtually non-existent. [46] Workers with 401(k) plans can purchase inflation-protected annuities, but generally individuals do not purchase any type of annuity – much less those with inflation protection.

Figure 5. *Purchasing Power of $1 Received at Age 55, by Age and Inflation*
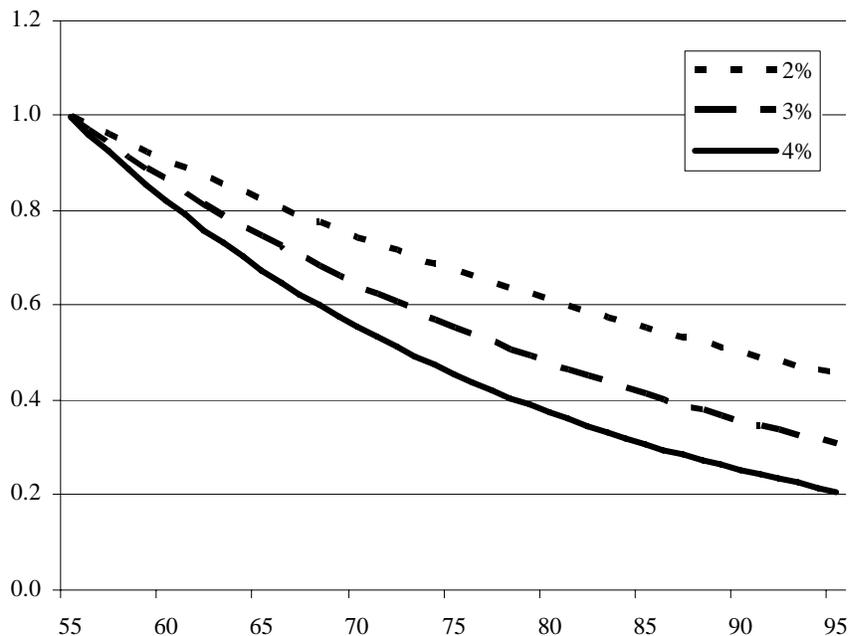
Source: Illustration.

A history of COLA adjustments for the Massachusetts system is presented in Appendix Table A1. Since legislation in 1997, subject to annual vote of the general court, Massachusetts provides a COLA of 3 percent per year on the first $12,000 of benefits. That is, the maximum increase is $360. This arrangement raises four questions: (i) Should the adjustment be automatic rather than subject to an annual vote?; (ii) Should the inflation adjustment be able to exceed 3 percent?; (iii) Should the adjustment be applied to a higher dollar limit?; and (iv) Should the

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[45] The new federal system provides the actual increase in the CPI for inflation up to 2 percent; 2 percent for inflation between 2 and 3 percent, and CPI minus 1 percent for inflation in excess of 3 percent. Under the old CSRS, participants receive a full COLA.
[46] When inflation was very high in the late 70's some firms made ad hoc benefit increases.

limit amount be indexed in some way to reflect either the increase in prices or the growth of wages?

The current COLA in Massachusetts would fall into the "ad hoc" category in Figure 6, since it has to be approved each year by the legislature. Most state systems, in contrast, make the adjustment automatically.

Figure 6. *Distribution of the Largest State Plans, by Type of Cost-of-Living Adjustment*
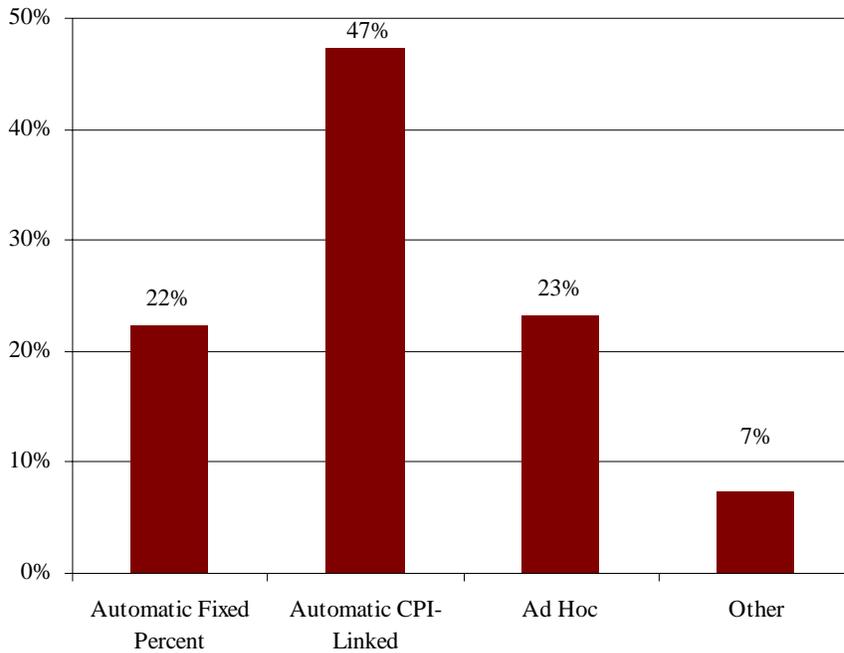
Source: Center for Retirement Research at Boston College survey of various annual reports and benefit handbooks.

The second issue is the 3-percent cap. If inflation should become a serious problem, the 3-percent cap would mean that even retirees with benefits below $12,000 would see their purchasing power eroded. Several states have a 5-percent cap, but interestingly these are not the states without Social Security coverage (see Figure 7 and Appendix Tables A3-A4)

Figure 7. *Limitations on Maximum COLA Percentage among the Largest State Plans*
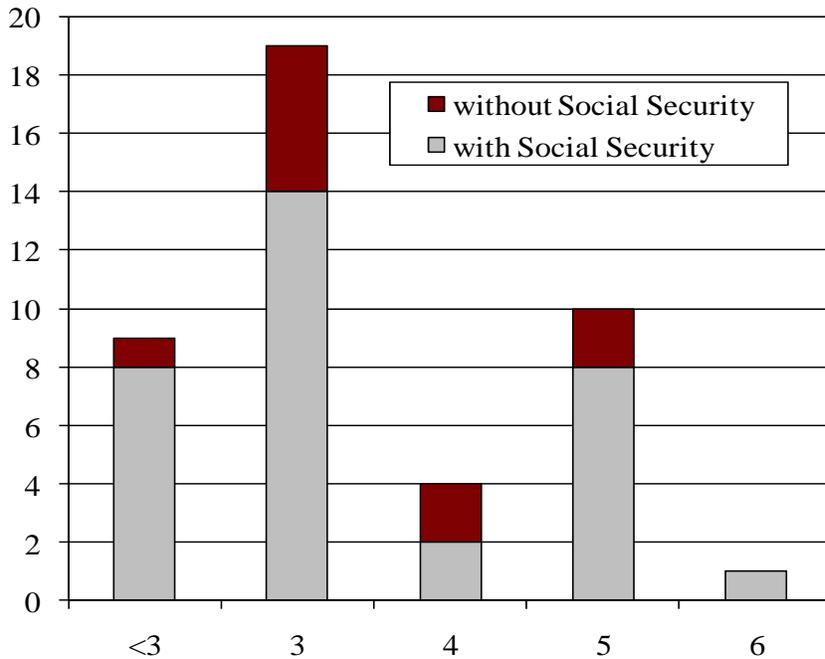
 As the provisions now stand, the COLA is targeted towards those with the lowest benefits, but those with benefits above $12,000 see the value of their benefits erode over time. The legislative history suggests that the intent was to provide indexing up to the amount of the average benefit. The $12,000 cap is well below the current average benefit in the State Retirement System of $24,075.[47] The question is whether the $12,000 should be increased, and, if so, by how much and when. Only two other states limit the base to which the COLA is applied: Michigan pays a maximum COLA of $300 and New York applies the COLA to only the first $18,000 of benefits. A second question is whether the increases in the base should be subject to legislation as under current rules, or automatic or at the discretion of the retirement boards with the approval of their governing body.[48]

Relaxing the constraints on the COLA, however, will raise the cost of the program. For current employees, one possibility is to offer the option of a lower initial benefit in exchange for more extensive indexing. For new employees, a more generous COLA could be included along with a package of offsetting benefit reductions or higher contributions.

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[47] Commonwealth of Massachusetts, State Retirement System, *Actuarial Valuation Report, January 1, 2009.*

[48] One member of the Commission suggests that, while increases may be desirable, many boards are struggling to recover from the market decline and could not afford to raise the base immediately. He suggests that any adjustments should be left to the discretion of the local retirement boards and at the State level, any increase would be determined by the Legislature with the approval of the Governor. Letter from Ralph White dated June 17, 2009.

VII. Disability

Poor health can interfere with the ability to work at an existing job or make it difficult to perform. Many employers, including the Commonwealth, provide paid sick days to accommodate short-term worker health problems and the early stage of what may turn out to be a longer problem. Additional programs providing benefits when not working are workers' compensation, 111F benefits, and disability benefits.[49]

The Commonwealth distinguishes between disability by reason of a non-job related condition (ordinary disability) and as a result of injury or hazard while in the performance of duties (accidental disability).[50] By and large, the former has a minimum years-of-service condition of 10 years for eligibility, while the latter does not have any minimum. This difference is common across states (see Table 9).

Table 9. *Distribution of the Largest State Plans by Vesting Period for Long-Term Disability Benefits*

Vesting period (years)	Off-the-job disability	On-the-job disability
0	11	55
1-4	14	8
5	51	29
8-9	4	3
10	24	9
10+	1	1

Source: Center for Retirement Research at Boston College survey of various annual reports and benefit handbooks.

With ordinary disability, the benefit equals the retirement benefit, calculated as if the member was age 55. If over 55, the superannuation benefit will be received if larger.[51]
With accidental disability, the benefit is 72 percent of salary,[52] plus an annuity based upon accumulated member contributions with interest. There is a limit of 100 percent of pay (reduced to 75 percent for post 1/1/1988 hires). Additional payments are available for those with young[53] or disabled children and for veterans. In other states, the basis for disability benefits is shown in Table 10.

The disability system in the Commonwealth has been the subject of considerable press attention, without careful distinction among different programs providing benefits. The flow chart shown

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[49] Since Massachusetts public employees are not covered under Social Security, only recent hires still meeting the coverage conditions would be eligible for Social Security Disability Insurance benefits.

[50] There is no distinction between injuries while holding a job with higher risk of disability and those with jobs without such a distinction.

[51] If the member is a veteran, the benefit is 50 percent of the final rate of salary during the previous 12 months, plus an annuity based upon accumulated member contributions with interest.

[52] In this case, salary refers to the greater of the annual rate of regular compensation on the date of injury or the average annual rate of regular compensation for the 12-month period for which the member last received regular compensation.

[53] Under 18 years or age or under 22 years of age and a full-time student.

in Appendix C needs to be completed in order to understand what portion of those who become sick end up on disability benefits each year.

Table 10. *Salary Base for On-the-Job Long-Term Disability Benefits among the Largest State Plans*

Salary base	Number of plans	
	On-the-job disability	Off-the-job disability
Earnings at disablement	18	10
1-2 years	8	8
Three years		
Consecutive	23	26
Non-consecutive	8	8
No specific rule	25	29
Five years		
Consecutive	12	12
Non-consecutive	1	0
No specific rule	5	6
Other[a]	4	5

[a] "Other" includes one plan with 3.5 consecutive year salary base, two plans with four consecutive years, one plan with four years with no specific rules on consecutive years, and one plan that provides a flat benefit.
Source: Center for Retirement Research at Boston College survey of various annual reports and benefit handbooks.

Due to time constraints, the Commission did not investigate disability retirement benefits provided under Chapter 32 or the broader system of disability determination and benefits that includes Workers Compensation and the benefits provided under Section 111F. For future groups evaluating the determination of disability, a flow chart similar to that provided in Appendix C might serve as a useful starting point.

VIII. Retiree Health Insurance

In Massachusetts, the state provides retiree health insurance for members of the State System; at the local level, health insurance is generally made available through the municipality for employees and retirees, including teachers. The contribution to retiree health insurance varies depending on each municipality's health insurance provisions. Along with pensions, health insurance is one of the largest liabilities that cities and towns face. Unlike pensions, most communities do not pre-fund their health insurance costs.

In most cases, employees are eligible for retirement benefits after 20 years of service, or at least ten years of service and having reached the age of 55. That means an individual with 10 years of creditable service can leave state employment before retirement, return at age 55 when eligible to

draw retirement allowance and qualify for the state, city, or town's full contribution towards retiree health insurance.[54]

Under the Commonwealth's retiree health insurance, retirees not eligible for Medicare, or too young for Medicare, receive benefits as though they were active employees. Retirees eligible for Medicare must enroll in that program, so that the state becomes the second payer. The State does not reimburse retirees for Medicare Part B premiums. As a result, the per-person cost to the State of retiree health insurance for those 65 and over is modest.

A general issue arises as to whether all retirees from a given public employer should receive the same level of benefits regardless of how many years of service they have or how many hours per week they have worked. Many other states have delinked retirement and health benefits by either pro-rating the contribution that they make towards retiree health benefits based on years of service and/or having different vesting rules for cash benefits and retiree health insurance benefits (See Appendix B). Massachusetts may want to consider following a similar path. For example, some states pay 25 percent of the subsidy for people with 5 years of service and 100 percent of subsidy for people with 20 years of service, with an increasing percentage between the two points.[55]

The Commission also received testimony regarding special issues faced by localities.[56] These issues include i) the vagueness of Chapter 32B, which does not contain a definition for the word retiree, or a definite vesting requirement; ii) the non-uniformity of benefits and contributions across localities; and iii) the lack of portability, which means that benefits are based on the plan and paid only by the city or town from which the employee retires.[57] Cities and towns may want to consider some standardization, at least perhaps to service requirements and some form of sharing of costs, as is done for pensions.

In addition to their comments of pension funding, the 2009 PERAC Actuarial Advisory Committee recommends that state and local employers should draw upon their past experiences at pre-funding their pension benefits and coordinate the funding of retiree health insurance and pension benefits.

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[54] Some jurisdictions such as Wellesley have created rules that require that an employee be eligible for and receiving health insurance benefits at the time of retirement and actually retire in order to get benefits. In those jurisdictions, an employee cannot leave service, return, and be provided with health insurance.

[55] Without changes to current law, prorating the state's contribution could create hardship for some low-paid public employees. CommCare provides health insurance for low-income workers who lack employer-based insurance. Currently, any level of employer insurance disqualifies persons for coverage under CommCare. Under current rules, retired public employees not eligible for CommCare because of coverage under the public employee health insurance, at least receive full retiree health insurance benefits from the public employee insurance program on the same terms as active workers. Pro-rated insurance may result in people who get no coverage under CommCare and minimal public employee health insurance benefits through the State.

[56] Kevin Feeley, Jr. of Collins, Loughran & Peloquin, P.C.

[57] In response, the town of Wellesley has drafted a regulation that requires employees to satisfy the following criteria in order to be eligible to receive health insurance benefits: i) the employee must retire directly from the community; ii) have a minimum 10 years of creditable service; and iii) enroll in Part B Medicare if eligible.

Appendix A. Summary of Anti-Spiking Provisions and COLA Benefits
in Largest State Plans

Table A.1a *State-Administered Plans with Percentage Anti-Spiking Provisions*

Plan name	Limit on annual increases for final average salary	Years in final average salary
Georgia ERS	5%	2
Arkansas Teachers	10	3
Colorado Municipal	8	3
Colorado School	8	3
Colorado State	8	3
Connecticut SERS[a]	14	3
Connecticut Teachers[a]	14	3
Iowa PERS	10	3
Louisiana SERS[b]	15	5
Louisiana Teachers	10	3
Maine Local	5	3
Maine State and Teacher	5	3
Maryland PERS[c]	20	3
Maryland Teachers[c]	20	3
Missouri PEERS	20	3
Missouri Teachers	10	3
Nebraska Schools	7	3
New York State Teachers[d]	20 (Tier 1); 9.5 (Tier 2); 4.9 (Tiers 3 and 4)	3
New York State & Local ERS[e]	4.9	3
New York State & Local Police and Fire	20	3
South Dakota PERS[f]	5	3
Utah Noncontributory[g]	10	3
Vermont Teachers	10	3
Illinois Universities	20	4
Kansas PERS	15 (current plan); 7 (new hires)	3
Mississippi PERS	8	4
Texas Teachers[h]	10	5

[a] Cap is limited to 130 percent of the average of the previous 2 years' salaries.

[b] No increases during their last four years of employment can increase the Average Compensation by more than 15 percent.

[c] With the exception of salary increases due to promotions, any increase in salary exceeding 20 percent is excluded from the calculation of the average final compensation unless approved by the Board of Trustees.

[d] Tier 2 annual salary increases limited to 120 percent of the average of the previous 2 years' salaries; Tier 3 annual salary increases limited to 110 percent increase of the average of the previous 2 years' salaries.

[e] Annual salary increases limited to 110 percent increase of the average of the previous 2 years' salaries.

[f] Applies to compensation received in the last four calendar quarters, as it relates to the amount earned in the highest calendar quarter prior to the last four calendar quarters considered. Compensation earned in the last quarter may also not exceed the amount earned in the highest previous calendar quarter by 25, 15, and 5 percent respectively.

Table A1b. *State-Administered Plans with Non-Percentage Anti-Spiking Provisions*

Plan name	Years in final average salary
Washington PERS Plan 1	2
Washington Teachers Plan 1	2
Montana Teachers	3
North Dakota Teachers	3
Ohio PERS	3
Ohio School Employees	3
Ohio Teachers	3
Oregon PERS	3
Pennsylvania School Employees	3
Virginia Retirement System	3
Wisconsin Retirement System	3
Wyoming Public Employees	3
Idaho PERS	3.5
California Teachers [a]	3
Illinois SERS	4
Illinois Teachers	4
Florida RS	5
Kentucky Teachers [b]	5

[a] Employees of the California Teachers plan use a 1-year averaging period if they have at least 25 years of service.
[b] Employees of the Kentucky Teachers plan use a 3-year averaging period if they are at least 55 years old with at least 27 years of service.

Table A2. *Massachusetts COLA History*

Year	Allowed percentage	Retirement benefit base
1971	6.0%	$6,000
1972	4.3%	$6,000
1973	3.3%	$6,000
1974	6.2%	$6,000
1975	11.0%	$6,000
1976	5.0%	$6,000
1977	5.0%	$6,000
1978	6.5%	$6,000
1979	5.0%	$6,000
1980	6.0%	$6,000
1981	3.0%	$7,000
1982	3.0%	$7,000
1983	3.0%	$7,000
1984	4.0%	$7,000
1985	4.0%	$8,000
1986	4.0%	$9,000
1987	3.0%	$9,000
1988	4.0%	$9,000
1989	NO COLA	
1990	NO COLA	
1991	NO COLA	
1992	5.0%	$9,000
1993	NO COLA	
1994	3.0%	$9,000
1995	NO COLA	
1996	3.0%	$9,000
1997	NO COLA	
1998	2.1%	$12,000
1999	3.0%	$12,000
2000	3.0%	$12,000
2001	3.0%	$12,000
2002	3.0%	$12,000
2003	3.0%	$12,000
2004	3.0%	$12,000
2005	3.0%	$12,000
2006	3.0%	$12,000
2007	3.0%	$12,000

Source: Massachusetts Teachers' Retirement System (2009).

Table A3. *Distribution of the Largest State Plans, by Type of COLA Benefit*

Cost-of-living adjustment	Number of plans		
	Total	Uncapped	Capped
With Social Security coverage			
Automatic fixed percentage adjustment	14	13	1 [a]
Automatic CPI-linked adjustment [b]	39	6	33
Full CPI	29	1	28
Partial CPI	10	5	5
Ad-Hoc legislative or board approved adjustment	22	22	0
Based on investments or funding status	7	5	2
Without Social Security coverage			
Automatic fixed percentage adjustment	10	10	0
Automatic CPI-linked adjustment	12	2	10
Full CPI	11	1	10
Partial CPI	1	1	0
Ad-Hoc legislative or board approved adjustment	3	1	2
Based on investments or funding Status	1	1	0

[a] Michigan SERS caps COLA at $300 annually.
[b] Includes Connecticut Teachers, whose plan COLA is based on the Social Security cost of living, which is derived from the CPI-W, and Tennessee Political Subdivisions, where the employer chooses whether or not to offer a CPI-Linked COLA with a maximum of 3 percent.

Table A4. *Limitations on Maximum COLA among the Largest State Plans.*

COLA type	Number of plans	With Social Security	Without Social Security
Automatic [a]	1	1	0
CPI-linked	43	33	10
Capped below 3% [b]	9	8	1
Capped at 3% [c]	19	14	5
Capped at 4%	4	2	2
Capped at 5% [d]	10	8	2
Capped at 6%	1	1	0
Ad Hoc	2	0	2
Based on investments or funding status [e]	2	2	0

[a] Michigan SERS caps COLA at $300 annually.
[b] Louisiana SERS allows up to 1 percent in additional COLA benefits dependent on investment returns.
[c] New York State ERS, TRS, and Police and Fire COLA benefit is capped at 3 percent and applied only to the first $18,000 of annual pension benefits. Colorado PERS, Teachers, and Local provide COLA at 3.5 percent.
[d] Connecticut Teachers lowers the cap depending on investment performance. If investment returns are under 8.5 percent, the cap is lowered to 1 percent and if investment returns are under 11.5 percent, the cap is lowered to 3 percent.
[e] Capped at 4 percent.

Appendix B. Summary of Retiree Health Insurance in Other States

Table B1. *State Plans with "De-Linked" Vesting for Retirement and Health Benefits*

Plan name	Service retirement	Retiree health insurance
Alaska PERS	5	10
Kentucky County	5	10
Kentucky ERS	5	10
Kentucky Teachers	5	10
Minnesota PERF	3	5*
Minnesota State Employees	3	5*
Minnesota Teachers	3	5*
New Jersey PERS	10	25*
New Jersey Police & Fire	10	25*
New Jersey Teachers	10	25*
New York State Teachers	5	10
NY State & Local ERS	5	10
NY State & Local Police & Fire	5	10
Ohio PERS	5	10
Ohio School Employees	5	10
Ohio Teachers	5	15
Oklahoma Teachers	5	8
Pennsylvania State ERS	5	15
Texas ERS	5	10
Texas LECOS	5	10
Texas Municipal	5	10
Texas Teachers	5	10
Tennessee State and Teachers	5	10

*Employee must retire immediately upon termination to be eligible for retiree health insurance benefits.
Source: Various annual reports and benefit handbooks.

Table B2. *States that Currently Pro-Rate Retiree Health Insurance Premiums Based on Credited Service*

Alabama	Louisiana	North Dakota
Arizona	Maine	Ohio
California	Maryland	Oregon
Colorado	Missouri	Rhode Island
Delaware	Nebraska	South Carolina
Hawaii	Nevada	Tennessee
Illinois	New Mexico	West Virginia
Kentucky	North Carolina	Virginia

Sources: Retiree Health Plans: A National Assessment (2008); and various annual reports and benefit handbooks.

Table B2a. *States that Pro-Rate the Health Insurance Premium as a Percentage of the Total Premium*

	Maximum subsidy		
	Years of service	Percent of premium	
State			Pro-rate formula
Alabama	25	100	2 percent reduction per year of service below 25 years
California[a]	20	100	5 percent reduction per year of service below 20 years
Delaware	20	100	25 percent reduction for every 5 years of service below 20 years
Illinois	20	100	5 percent reduction per year of service below 20 years
Louisiana	20	75	18-19 percent reduction for every 5 years of service below 20 years
Maine[b]	10	100	10 percent reduction per year of service below 10 years
Maryland[b]	16	100	0.5208 percent reduction per month of service below 16 years
Nebraska[c]	28	100	90 percent for 20-27 years of service, 70 percent for those with 16-19 years of service, and 50 percent for those with 10-15 years of service
New Mexico	20	100	6.25 percent reduction per year of service below 20 years
North Carolina	20	100	50 percent reduction per year of service below 20 years
Ohio	30	100	5 percent reduction per year of service below 30 years
Rhode Island	28	100	The state pays 80 percent of the premium for those with at least 20 years of service and provides no subsidy for those with less than 20 years service.
South Carolina[d]	25	100[e]	The state contributes 100 percent of employer portion of premium for retirees with 25+ years of service, 50 percent for 15-25 years, and no contribution for 5-15 years.

[a]California requires that the employee retire within 120 days of termination in order to be eligible for retiree health insurance.
[b]Requires that the employee retire immediately after termination in order to be eligible for retiree health insurance.
[c]For those who retire at age 65 or older. For those who retire between age 60 and 65, 100 percent of the premium is paid for 35 years of service, 90 percent for 28-34 years of service, 70 percent for 16-27 years of service, and 50 percent for 10-15 years of service.
[d]The state only subsidizes the employer portion of the health insurance premium. Retirees must always pay the full amount of the employee portion of the premium. Retirees pay a decreasing portion of the employer premium as they accumulate years of service.
Sources: Retiree Health Plans: A National Assessment (2008), and various annual reports and benefit handbooks.

Table B2b. *States That Pro-Rate Health Insurance Premium as a Dollar Amount*

State	Maximum Subsidy		Pro-rate formula
	Years of service	Dollar amount	
Arizona[a]	10	$150	$15 reduction per year of service below 10 years
Colorado[b]	20	$230	5 percent reduction per year of service below 20 years
Hawaii	25	$445.54	25 percent reduction 15-25 years of service and 50 percent reduction for 10-15 years of service
Kentucky	N/A	N/A	$15 ($10) per year of service for Hazardous (Non-Hazardous)
Nevada	20	$191 to $477	$27 subsidy reduction per year of service below 20 years
North Dakota	N/A	N/A	$4.50 per year of service
Oregon	30	$253	$25-$26 subsidy reduction per 5 years of service below 30 years
Tennessee	30	Retiree pays $96 - $102 premium	$143-$152 for 20-29 years of service, and $191-$203 for less than 20 years of service
Virginia	N/A	N/A	$4.00 per year of service

[a]For non-Medicare-eligible retirees. For Medicare eligible retirees, a maximum subsidy of $100 is allowed for those with at least 10 years service with a $10 subsidy reduction per year of service below 10 years.
[b]For non-Medicare-eligible retirees. For Medicare eligible retirees, a maximum subsidy of $115 is allowed for those with at least 20 years service with a 5 percent subsidy reduction per year of service below 20 years.
Sources: Retiree Health Plans: A National Assessment (2008), and various annual reports and benefit handbooks.

Appendix C. Process for Injured Employee, beginning with Sick Leave up until Disability Retirement

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┌──────────────────────────┐        ┌────────────────────────────────────┐
│ Police and Fire Sick Leave│        │ General Employees and Teachers Sick Leave│
└──────────────────────────┘        └────────────────────────────────────┘

┌──────────────────┐                                      ┌──────────────────┐
│ Returned to Work │                                      │ Returned to Work │
└──────────────────┘                                      └──────────────────┘

        ┌──────────┐                          ┌──────────────┐
        │   111F   │                          │ Workers  Comp│
        └──────────┘                          └──────────────┘

┌──────────────────┐                                      ┌──────────────────┐
│ Returned to Work │                                      │ Returned to Work │
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                                                  │  Lump Sum    │
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                    ┌──────────────────────┐
                    │ Apply for Disability │
                    │     Retirement       │
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        ┌────────┐        ┌─────────┐        ┌─────────┐
        │  Deny  │        │ Approve │        │ Remand  │
        └────────┘        └─────────┘        └─────────┘
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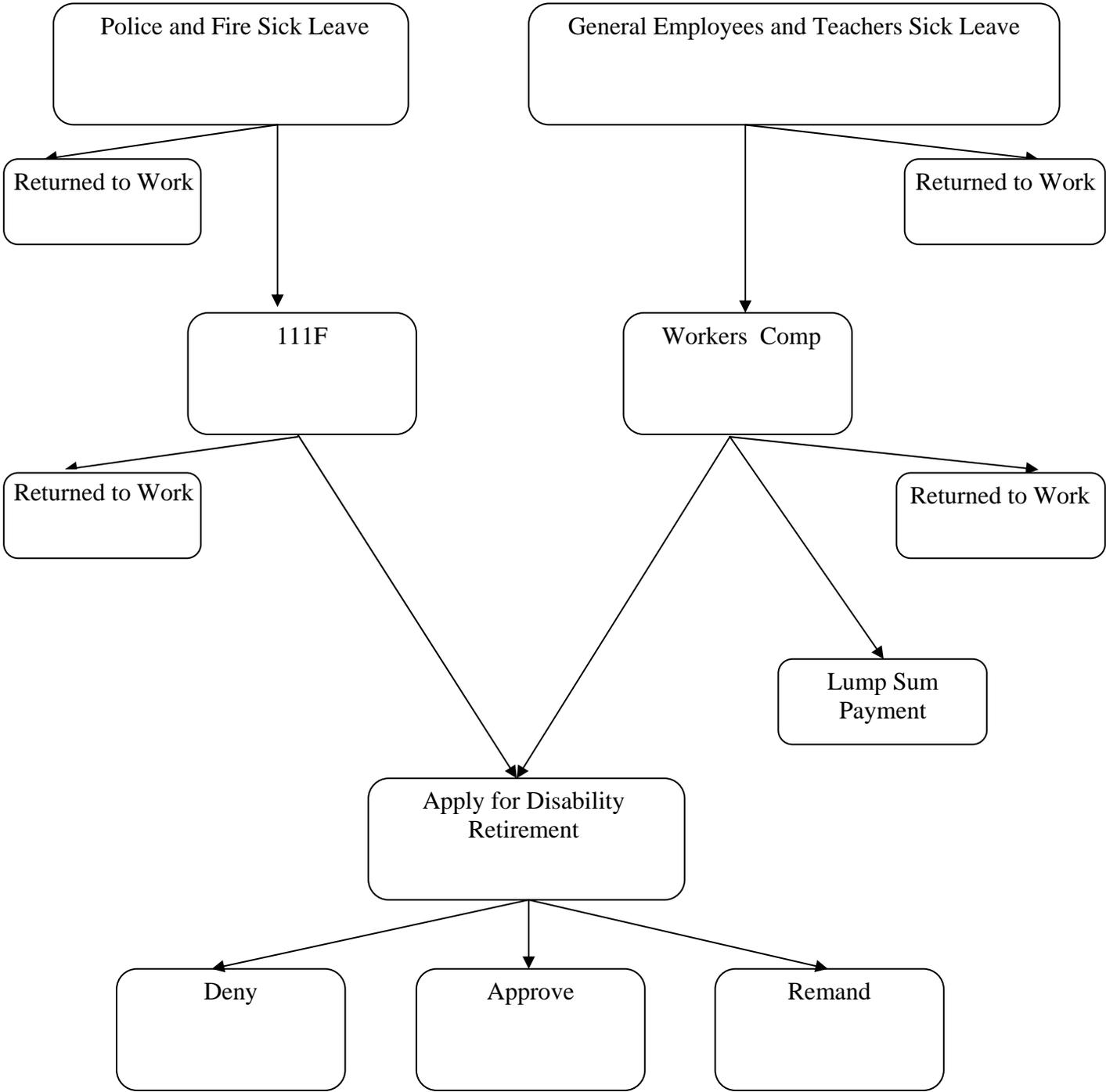
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Technical Analysis

I. Introduction

While the central elements affecting the level of retirement benefits are straightforward to describe – three-year salary average, 2.5 percent accrual rate for each year of service, 80 percent cap on the replacement rate, and annual cost-of-living adjustments on a base limited to $12,000 – their implications are not transparent. This appendix examines the implications of current retirement provisions for workers with different career characteristics. It also explores some workings of termination allowances and Retirement Plus. While a complete analysis of these issues should be based on a sample of earnings histories representative of the actual members of the system (and projections of likely future histories), such a sample was not available for this Commission. Thus, the following analysis uses hypothetical earnings histories.[58]

II. Distribution of Benefits and Contributions

The distribution of benefits and contributions among workers depends on promotions and pay freezes near the end of a career, differing rates of wage growth throughout a career, varying ages for the start of a career, varying timings of a public sector career within a longer working career, and the rate of inflation.

In order to compare the lifetime experiences of different workers, this analysis presents the ratio of the value of lifetime pension benefits to accumulated contributions. Aggregating annual benefits and contributions requires the choice of a discount rate. The bulk of the presentations use a 4-percent discount rate, while some use an 8-percent discount rate. The 8-percent rate represents the expected return on pension fund assets and therefore the *expected* cost to the Commonwealth to provide benefits. Since this assumption ignores the fluctuations in the rate of return on the actual portfolio from year to year, it ignores the cost to taxpayers of bearing the risk associated with providing benefits that are supported by the portfolio. While the state is much better able to bear risk than the typical individual worker, these fluctuations can be substantial and do impose a real cost on taxpayers, as 2008 made painfully clear.

Workers do not have access to assets that pay a safe return of 8 percent. Instead, their available return on a safe asset would be closer to 4 percent. Thus, the calculations use both 4 percent and 8 percent, which represent the value to the worker from paying contributions and receiving benefits, on the one hand, and the expected cost to the Commonwealth of providing the benefits, on the other. Both are relevant for interpreting the pattern of benefits and contributions across different earnings paths for different questions. The 4-percent case is appropriate for evaluating the fairness of the treatment of different workers and the incentive for a worker to retire. The 8-percent calculations are relevant for calculating the expected cost to the Commonwealth of hiring

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[58] This "Technical Analysis" presents refinements and extensions of the material in the "Background Document," which was submitted on September 1, 2009. As a result, the figures in the "Background Analysis" (formerly the "Background Document") and the "Technical Analysis" may differ slightly. Technical analyses of teacher pension plans have been done for a number of states, including Massachusetts. See Robert M. Costrell and Michael Podgursky, "Peaks, Cliffs and Valleys: Incentives in Teacher Retirement Systems and their Consequences for School Staffing," Education Finance and Policy, Spring 2009 Vol 4, No. 2, Pages 175-211.

people with different earnings expectations. Additional calculations and the computer code will be made available upon request.

A. Late-career Promotions, Pay Freezes, and General Earnings Growth

A critical part of the benefit formula is the averaging of earnings over three years. For a given age and number of years of service, the initial benefit is proportional to this earnings average. Thus, the earnings path during those three years is important. If two workers with identical histories are candidates for a promotion in the last years of work, with one getting it while the other does not, their pension benefits will differ. If the promotion raises the average salary over the three years by 10 percent beyond normal increases, the initial pension benefit will be 10 percent higher. For a long-career worker with an 80 percent replacement rate, this 10 percent increase in the initial pension benefit is 8 percent *of average earnings*. In present discounted value, each additional $1.00 of an initial pension benefit starting at age 65 is worth $12.51.[59] Thus the value of the lifetime pension increases by roughly 100 percent of the annual earnings prior to the promotion. The increase in total compensation, salary plus pension benefits, is approximately 4.3 times the value of the promotion over the three years.[60]

While some difference in pension value is appropriate as a consequence of a promotion, the size of the increase in the current pension system raises a question of fairness between a worker who receives a promotion and one with a similar earlier career who does not. This large payoff to a late promotion might affect who applies for promotions and who gets them and so may affect the efficient provision of public services.

Reliance on the last three years of earnings creates not only opportunities for employees but also risks. A worker with a 50-percent chance of getting a promotion faces a large risk as to pension level. If pensions were less sensitive to late-career effects, and were of the same average size, retirees would face less risk in benefit level from the uncertainty over who will get a promotion. Risk to benefit levels also arises from general fiscal circumstances. For example, if fiscal circumstances result in a one-year pay freeze between the last two years, then, relative to a projected 4.5 percent raise, the initial benefit is reduced by 1.5 percent, affecting all later benefits as well. A two-year pay freeze nearly triples this reduction to 4.4 percent. Recognizing the large present discounted value of benefits, the risk to total receipts, earnings plus pension, is much larger than the risk to earnings alone.

B. Distribution Over Varying Rates of Earnings Growth

Different occupations within government may offer different rates of earnings growth over the course of a career. With benefits calculated on the basis of final three-year averages, workers who experience faster rates of wage growth will receive higher returns on their pension contributions than those with relatively flat earnings profiles. This result occurs because the

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[59] This calculation assumes that the pension is larger than the limit on benefits receiving a COLA, so that there is no additional COLA as a consequence of the pension being larger.

[60] The increased pension value is 12.51 times the 80 percent replacement rate times the 10 percent increase in average earnings, where 12.51 is the present value factor for an additional dollar of pension benefit beginning at age 65, assuming that the pension already exceeds the COLA base.

benefit depends only on the late-career earnings, while the contributions depend on earnings throughout the career.

To demonstrate the quantitative importance of different earnings patterns on benefits, Figure 1 shows the ratio of lifetime pension value to accumulated contributions for employees with different rates of earnings growth. Someone with earnings growth of 3 percent will receive benefits equal to 2.29 times contributions, compared to 2.95 for someone with earnings growth of 5 percent – nearly 30 percent larger. While some variation in the expected rate of return on contributions is appropriate in a defined benefit plan, these differences seem large and difficult to justify. With an 8-percent discount rate, someone with earnings growth of 3 percent will receive benefits equal to 0.68 times contributions, compared to 0.98 for someone with earnings growth of 5 percent – 44 percent larger.

C. Distribution Over Varying Starting Ages

The current workforce started public employment at a wide range of different ages. The starting age affects how well one does under the pension system. Calculations of this starting-age effect require making some assumption about the initial salary of individuals who begin public employment at later ages. For simplicity, the assumption used here is that earnings depend solely on age and not tenure with the state, which is reasonable for individuals who begin state employment after working in other capacities. It would not be representative of a worker who enters the labor force for the first time at a later age.

Figure 2 shows the ratio of lifetime benefits to accumulated contributions for workers starting at different ages, all of whom retire at age 65. With a 4-percent discount rate, a worker starting at age 35 receives 18 percent (3.26/2.77) more in benefits relative to contributions compared with a worker starting at age 25. And a worker starting at age 45 receives 17 percent more (3.24/2.77). Thus, those starting younger get less in lifetime pension benefits for each dollar of accumulated contributions. These differences arise for several reasons. The most important is that the longest-serving individuals in this example will have hit the 80 percent cap on the replacement rate. Figure 3 shows the relative sizes of the ratios under the assumption that a worker retires on reaching the 80-percent cap, if that is before age 65. While a worker starting at age 35 gets an 18-percent higher return on contributions than one starting at 25 if they both work to age 65, they get roughly the same return on contributions if the earlier starter retires on hitting the 80-percent cap on benefits. This comparison shows the disincentive to continued work once the 80-percent cap is reached, a topic that will be addressed in more detail below.

Another perspective comes from comparing the ratio of benefits to contributions for workers with 20 years of service but different starting and ending dates. In each case, the assumption is that benefits are not claimed before age 55. Those starting earlier get lower lifetime benefits relative to accumulated contributions than those starting later – workers starting at age 35 receive 30 percent (3.16/2.47) more in benefits relative to contributions compared with workers starting at age 25 (see Figure 4).[61] Depending on the nature of retirement savings opportunities with

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[61] Note that this ignores the complications of allowing a refund of contributions, but in the current case the value of the pensions exceeds that of a refund of the contributions.

other employment, this difference may be compounded by the differences in these other opportunities.

D. Distribution Due to Varying Levels of Inflation

The future of inflation is uncertain. With initial benefits proportional to the three-year final earnings average, the ratio of the three-year final average to the earnings in the final year is a measure of the impact of inflation within this three-year period. The full impact of inflation on the purchasing power of benefits depends on how the inflation affects earnings. A baseline case to consider is where earnings keep up with inflation. For this case, Figure 5 shows the ratio of the three-year average earnings to final earnings for different inflation rates, measured relative to the ratio with 3-percent inflation, which is a rate that seems appropriate with 4.5 percent earnings growth toward the end of a career. The variation is significant, going from a 3-percent higher ratio with zero inflation to 8-percent lower with 13-percent inflation, a level reached in the late 1970s. This calculation shows the risk associated with not having earnings indexed for inflation when calculating the three-year average of earnings.[62]

Another way that inflation affects the purchasing power of benefits is from the limits on the COLA. The COLA is restricted to 3 percent, so if inflation exceeds 3 percent the COLA will not maintain the purchasing power of the pension. In addition, the COLA is restricted to the first $12,000. Thus even when the COLA percentage increase matches the inflation rate, the purchasing power of the benefit is not maintained when it exceeds $12,000. In this case, the higher the inflation rate the more rapidly the pension grows and so the less successful the COLA is in maintaining the purchasing power of the pension over time. These two elements are brought together in Figure 6, which shows the present value of benefits at different inflation rates after retirement relative to that at 3-percent inflation for our standardized full-career worker, calculated for a given initial benefit equal to approximately 3.9 times the COLA base limit, and assuming that inflation-adjusted discount rates are not affected by the level of inflation. The lifetime value of inflation-adjusted benefits is 38 percent higher at 1 percent inflation than at 5 percent.[63]

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[62] At the other extreme, if inflation has no effect on nominal earnings levels, the ratio of the current three-year average to final pay does not vary with inflation. However, in this case, final earnings are not a good measure of the purchasing power of initial benefits. Focusing just on the inflation within the averaging period, we look at the ratio of the three-year average benefits to the purchasing power of the earliest earnings in the averaging period. Again using 4.5 percent earnings growth, the ratio of the three-year average benefits to the earliest of the averaged earnings, adjusted for purchasing power, can be compared to that with 3-percent inflation. The ratio is 6 percent higher with zero inflation and 17 percent lower with 13 percent inflation than with 3 percent.   At a national level, the very high inflation rates of the late 1970s were associated with real wage declines.

[63] As in other figures, we use a $40,000 COLA base here since the calculation is for workers retiring 40 years from now. The effects are identical to those that would occur with a $12,000 COLA base, just at a higher level. The assumption made here is that inflation is constant throughout retirement; however, the impact on the results is driven by inflation in the first years after retirement, so the scenarios are not as extreme as they might appear.

III. Incentives for Continued Work

The pension system matters for retaining workers in public service due to the incentives it creates to keep working or to retire. One way to measure these incentives is the accrual of pension value relative to earnings net of the pension contribution. Since the pension applies to a large set of workers with widely varying circumstances, economic theory supports a relatively smooth incentive from the pension system rather than one that varies between large incentives to continue work and large disincentives, sometimes over short intervals

A. Pension Accrual as Part of the Incentive to Work for the Current Year

Figure 7 reports the year-by-year pension contribution to the incentive for an additional year of work (as a percent of net earnings) for workers 55 and over who started at ages 25, 35, and 45.[64] If a worker who started at age 25 is 55 and delays retirement for one year, the increase in the lifetime value of the pension from another year of work is equal to 46 percent of the salary net of contributions. For the workers who started at 35 and 45, the increases in lifetime pension value are 36 percent and 48 percent of net earnings, respectively. One striking finding shown in the figures is the role of the 80-percent maximum benefit in sharply decreasing the incentive to continued work. After reaching the 80-percent cap, the lifetime value of the pension decreases significantly with each year of further work. Workers starting at 25 reach the 80-percent cap prior to reaching 65 and experience one sharp drop in the incentive to continue work, while workers starting at 35 experience a stepwise decrease in which they first hit the highest benefit accrual rate at age 65 and then, a few years later, the 80-percent cap. Workers starting at 45 do not reach the 80 percent cap until after age 69. Thus the pension system adds a great deal to the incentive to continue employment for a while, but then subtracts a great deal from that incentive once the 80-percent cap binds.

Figure 8 shows the same calculation for a worker starting at age 25 extended to include vested terminations before age 55. This figure illustrates the backloading of the pension, as the accrued pension relative to net earnings is much lower at earlier ages.

B. Pension Accrual as Part of the Incentive to Return to Work After a Gap

Basing benefits on the last three years of earnings and not indexing the average earnings for inflation over the period from a termination until a deferred pension claim creates a strong incentive for a worker who left public service after vesting to return to work for three years. Figure 9A shows the increase in lifetime pension value from returning to work relative to the net earnings during the three-year return period for different periods of time outside public

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[64] Consider a 55 year old. Stopping work would result in a pension, which we assume is begun immediately. Working for an additional year, the pension would be based on the 3-year average earnings that included the next year's salary and the benefit factor for being a year older, although the latter would not apply if the 80 percent maximum benefit rule applied. This results in a higher monthly pension that would start a year later. We discount the higher pension back to the decision point at age 55, allowing for the possibility of dying during the year on the value of the pension. The evaluation of the incentive to continue work ignores survivor benefits for workers who die before claiming retirement benefits. The calculations for this figure assume that the COLA base is constant throughout the career. If the base changes from time to time, the calculations show the incentive assuming an accurate forecast of the level actually present at the time of retirement, and assumed unchanged thereafter.

employment.[65] The numbers are very high, much higher than those in the incentive to simply continue working, as reported above. Figure 9B repeats this calculation using the 8-percent discount rate, reflecting the expected cost of pension benefits. With an 8-percent discount rate, a return to work delays the start of benefits and so allows further accumulation of earlier contributions, reducing the measured ratio compared with a 4-percent discount rate. The ratios remain high for early departures, but turn negative for one close to retirement.

One can also relate the increase in pension value to the contributions during a return to work. As an example, consider a worker who starts with the state at age 25 and works until age 50. This worker's pension upon leaving at 50 would be worth $662,000, claimed at 55 (the evaluation discounted to age 50). Now suppose instead that the worker returns to work at age 62 and works until 64. The three-year average earnings increase 4.5 percent per year over the gap years from $100,000 to $193,000 and the pension value increases to $940,000 (the evaluation discounted to age 50). However, the added contributions paid over these three years are only $37,000 (evaluated at age 50). Thus, the increase in the pension value is 7.5 times the added contributions. If earnings on the return to work only reflected 3 percent inflation, rather than 4.5 percent wage growth, the earnings growth and so the pension growth would not be so large. In this case, the increase in pension value is still 4.5 times the added contributions. Since the increase in pension value exceeds the additional contributions so dramatically, the pension system generates a strong incentive to return to work for these three years beyond that provided by the salary.

C. Pension Accrual Incentives Under Retirement Plus

Since July 2001, all newly-hired teachers have been enrolled in an alternative pension system known as Retirement Plus.[66] This alternative system has a contribution rate of 11 percent (rather than the 9 percent plus 2 percent of salary in excess of $30,000 present earlier) and provides members who have at least 30 years of service an extra 2 percent of final average salary for each full year of creditable service in excess of 24 years, up to the same statutory maximum of 80 percent. This new system changes the incentive to continue working. Figure 10 shows the role of the pension in the incentive to work another year with and without Retirement Plus for teachers starting at age 25. Retirement Plus greatly encourages continued work when close to 30 years of service. Conversely, as a result of interaction with the 80-percent cap, Retirement Plus greatly discourages the longest teaching careers.

IV. Termination Allowances

Workers with at least 20 years of service at the time of an involuntary termination (not for cause) are entitled to a termination allowance in place of their superannuation benefit. The termination allowance is calculated as one-third of the member's 3-year average salary plus the annuitized

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[65] These calculations continue to assume that wages are solely a function of age and thus there is no reduction in wages after the return due to departure. Also, the accumulated contributions are left with the state, not withdrawn followed by repurchase of the years of service.

[66] Teachers hired before July 2001 were eligible to opt-in upon payment of an additional contribution amount.

balance of the employee's accumulated contributions, determined using a 7-percent return.[67] For a typical worker, the 1/3 rule determines the bulk of the benefit. A typical value of the 1/3 allowance plus annuitized balance is a bit more than 40 percent of the final average salary in a sample of termination allowances recently claimed in the state retirement system.[68] The benefit starts immediately, with no increase available for deferring its start.

A rationale for the termination allowance is that benefits are backloaded (as shown in Figure 8) in part to encourage continued work. But the incentive to continue work at the same job is not relevant for someone who was terminated, although there is concern about the incentive to seek another job in public employment. Possible termination with a small pension subjects employees to a risk, which is of particular concern since the public employees are not covered by Social Security. A typical employee starting at 25, who voluntarily terminates at 45, would be eligible for a superannuation benefit of $7,979 if claimed immediately.   This amount equals 10 percent of final average earnings. However, if the termination was involuntary, the initial termination benefit would be $37,562, or 47 percent of the final average salary. The termination allowance provides a substantial add-on to the pension available via the superannuation allowance.

Figure 11 shows the relative sizes of termination and superannuation pensions. The dashed line is the present discounted value of lifetime termination benefits for a worker with a typical earnings trajectory who began employment at age 25 and was terminated at different ages. The solid line shows the lifetime superannuation benefits for the same worker if the departure were voluntary and the benefit is claimed at the age of separation or age 55, whichever is later. Two patterns are evident. First, the lifetime values of termination benefits are high relative to those of superannuation benefits, particularly at younger ages. Second, the lifetime values of termination benefits are lower for people who are terminated later, despite the fact that they have worked longer. For example, under the rules for superannuation benefits, a Group 1 employee entering at age 25 who voluntarily terminates at 49 would be entitled to a superannuation pension worth roughly $500,000.[68] However, if the termination were involuntary, the termination pension has a lifetime value of $960,000, almost twice as much. Similarly, an employee voluntarily terminating employment at 55 would receive a superannuation pension worth $740,000 while a termination allowance at the age is worth $880,000. Thus, while the value of the superannuation pension is increasing sharply with each additional year of service (until the 80 percent cap binds), the value of the termination pension is actually falling. Moreover, Figure 11 shows that the lifetime value of the pension if terminated at age 45 is worth more than the superannuation pension with continued work no matter what the retirement age. This design element strongly discourages former employees from returning to work for the Commonwealth.

Also, from the perspective of providing adequate income at ages when most people fully retire, the early start in termination benefits is probably not as valuable as a sufficiently larger benefit

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[67] In computing termination pensions and accumulated balances, interest is credited to the annuity savings fund at the 3.5 percent rate consistent with the actuarial assumptions in the valuations of the state retirement system and teachers' retirement system. Interest is credited monthly.

[68] This calculation assumes that the employee waits until age 55 to claim the pension.

starting later, but the one-third portion of the termination benefit does not include an increased monthly amount for a delayed start.[69]

V. Conclusion

This appendix has examined some implications of the current design of the retirement pension and select ancillary benefits with a focus on the distribution of benefits and on the incentives to work. The analysis has identified a number of features of the current system.

In present discounted value, each additional $1.00 of an initial pension benefit starting at age 65 is worth $12.51. Thus a great deal is riding on each dollar of additional earnings in the three-year averaging period. As a consequence, two workers with similar careers that diverge at the end can get benefits of very different lifetime values. Also, there is considerable pension risk for workers related to what happens to earnings within the averaging period – risks coming from getting or not getting a promotion, from the general level of pay increases, and from inflation. Moreover, this reliance on only three years of earnings is an invitation to manipulate earnings.

With contributions paid throughout a career and benefits based on earnings levels in just three years, there are wide differences in the value of lifetime pension benefits relative to the accumulated value of contributions. Those with more rapidly rising earnings trajectories throughout their careers get more in benefits relative to contributions than those with slowly rising earnings trajectories. Workers who complete 20-year careers starting at earlier ages get less in benefits relative to contributions than those starting later. Evaluations across different length careers ending at retirement ages depend on which retirement ages are chosen – a reflection of the considerable importance of the 80-percent cap on benefits of those with the longest careers.

The 80-percent cap strongly discourages continued work once the cap is reached. The interaction of the cap with Retirement Plus strongly encourages retirement at a younger age than without Retirement Plus. More generally, the pension system is backloaded so that those in their fifties are receiving far more in accrued pension value (relative to earnings) than those in their thirties. This structure offers a large incentive to vested terminated workers to return to work toward the end of their careers.

Termination benefits are large relative to superannuation benefits available at the same ages. They decrease in lifetime value when they occur at a later age with more years of service. They strongly discourage looking for alternative work covered by the pension system.

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[69] An examination of the member handbooks of the 107 largest state retirement systems outside of Massachusetts revealed only two other major plans that provide widely applicable involuntary termination benefits – Montana and the District of Columbia Teachers Retirement Plan. The DC Teachers Plan gives workers over age 55 the same benefit as if they were 60 and eligible for the retirement benefit and workers under age 55 receive a .167 percent reduction in their retirement benefit for every month prior to age 55. The Montana Public Employees' Retirement System allows terminated workers to buy up to three additional years of service with the employer paying part of the cost. Some workers in Virginia have a termination benefit that removes the early retirement reduction for involuntarily terminated workers claiming prior to the normal retirement age.

Some of this analysis lends support to some of the recommendations considered by the Commission. However, the Commission has not given consideration to more fundamental changes. To pursue the potential value of more fundamental changes, one would want a sample of individual earnings histories to see the extent that the points made with hypothetical earnings paths apply to actual ones. Having noted some shortcomings inherent in a benefit design based on earnings in a short period toward the end of a career, we note that private plans have not only moved away from defined benefit plans but that companies that have preserved defined benefit plans have been shifting away from final average plans.[70] And we note that the United Kingdom has moved away from a final average plan for civil servants to a career CPI-indexed plan.[71]

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[70] Among defined benefit plans, according to a 2006 Watson Wyatt survey of defined benefit plans with at least 1000 active participants, 56 percent are final average pay, while 27 percent are career average. In the largest plans (25,000 or more participants) there were 47 final average pay plans and 31 career average plans in 2006, while the numbers were 62 and 22 a year earlier. 2006 Survey of Actuarial Assumptions and Funding, available at http://www.watsonwyatt.com/research/resrender.asp?id=2007-US-0083.

[71] See http://www.civilservice.gov.uk/Assets/nps_tcm6-1866.pdf.

Figure 1. *Lifetime Pension Benefit Relative to Accumulated Contribution, By Rate of Earnings Growth, 4-Percent Discount Rate*
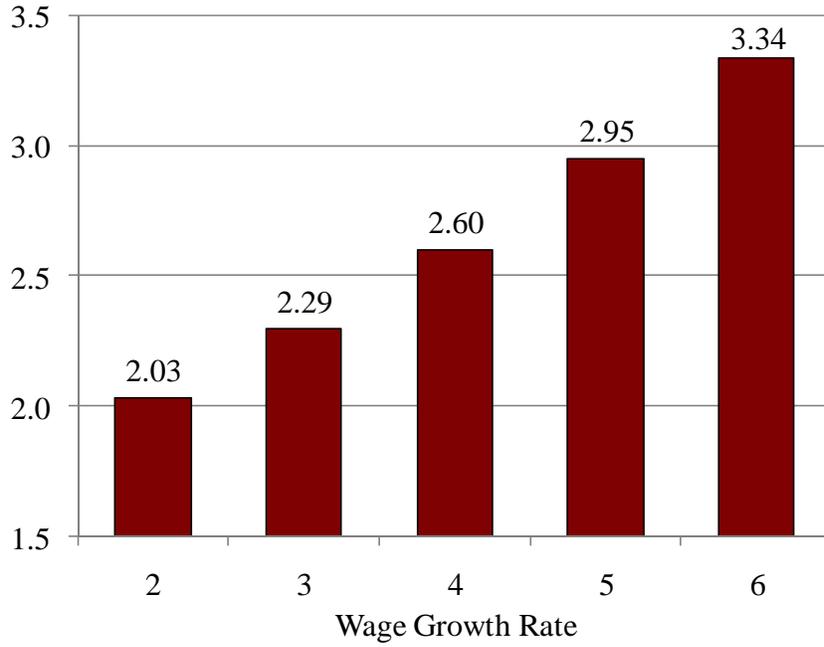

Figure 2. *Lifetime Pension Benefit Relative to Accumulated Contribution for an Employee Departing At Age 65, By Starting Age, 4-Percent Discount Rate*
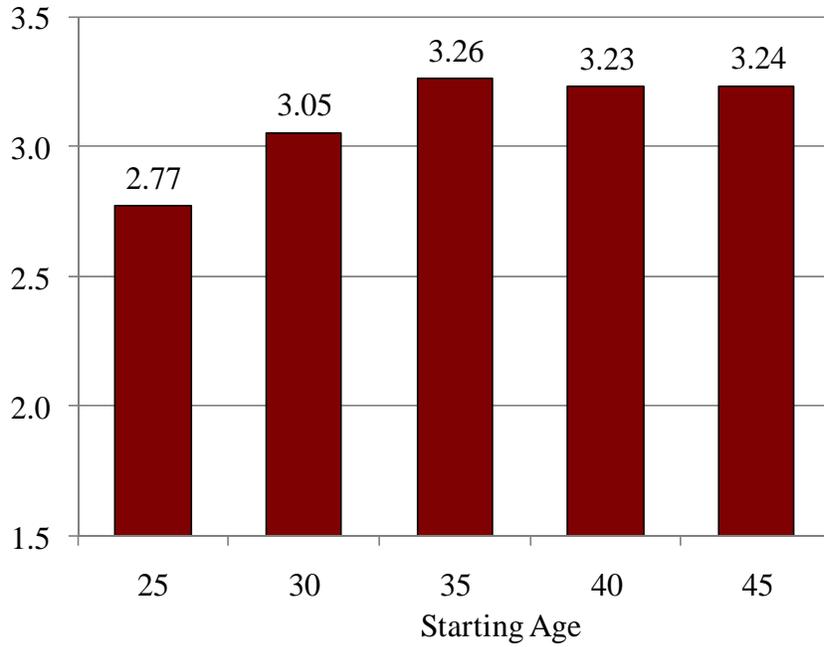
Figure 3. *Lifetime Pension Benefit Relative to Accumulated Contribution for an Employee Departing at the 80-Percent Cap If Before Age 65, 4-Percent Discount Rate*
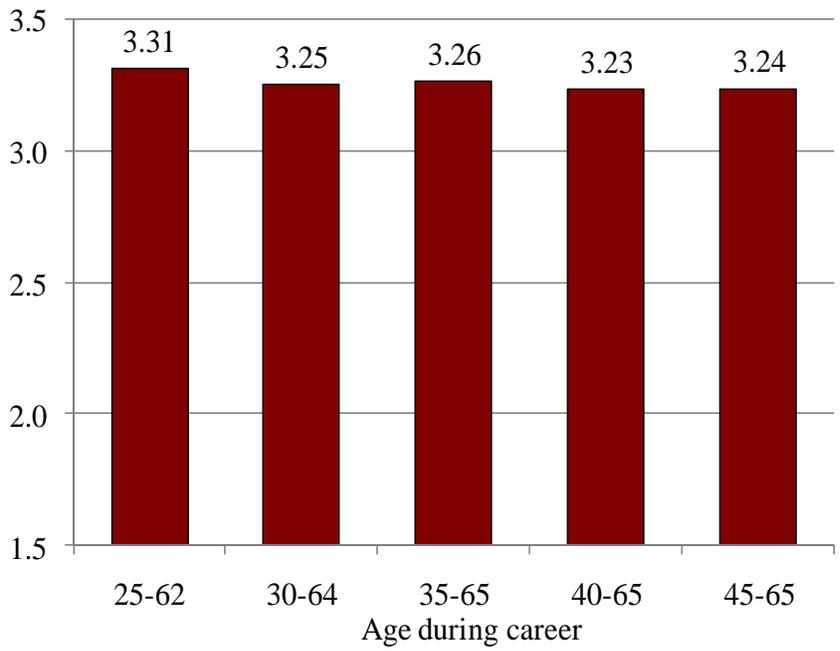

Figure 4. *Lifetime Pension Benefit Relative to Accumulated Contribution for an Employee with 20 Years of Service, By Starting Age, 4-Percent Discount Rate*
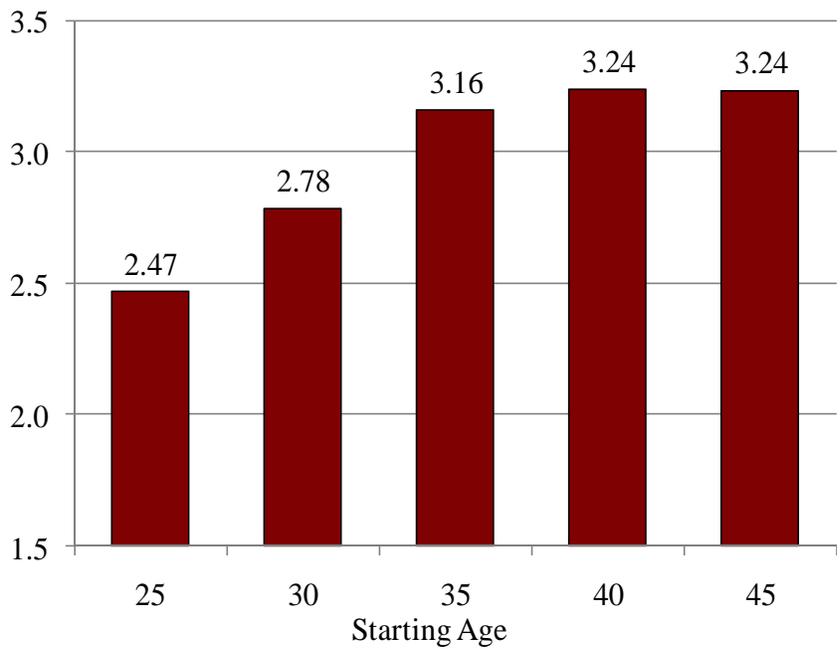
Figure 5. *Ratio of Final Average Earnings to Final Year Earnings Relative to That at 3-Percent Inflation Rate, By Inflation Rate, 4-Percent Discount Rate*
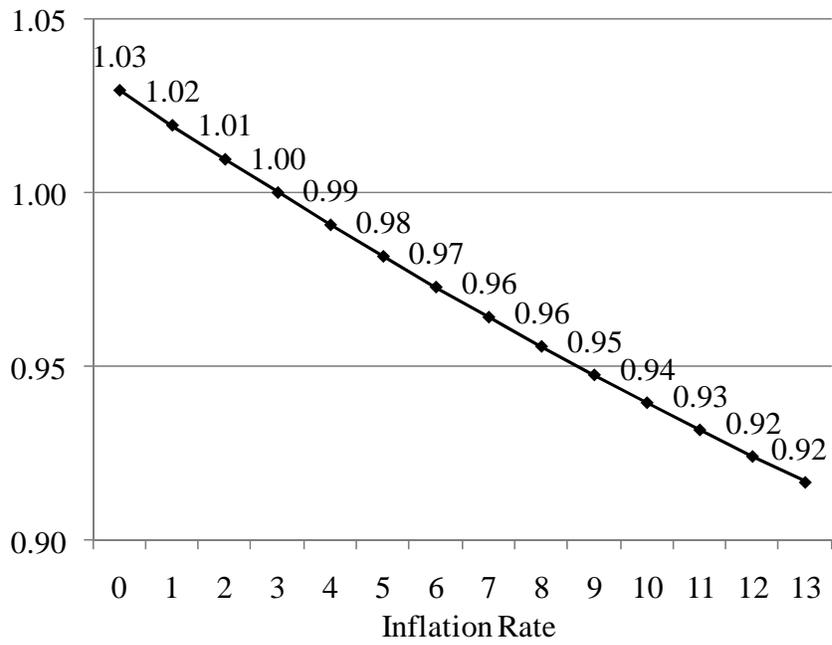

Figure 6. *Lifetime Inflation-Adjusted Pension Benefit Relative to That at 3-Percent Inflation Rate, By Post-Retirement Inflation Rate, 4-Percent Discount Rate*
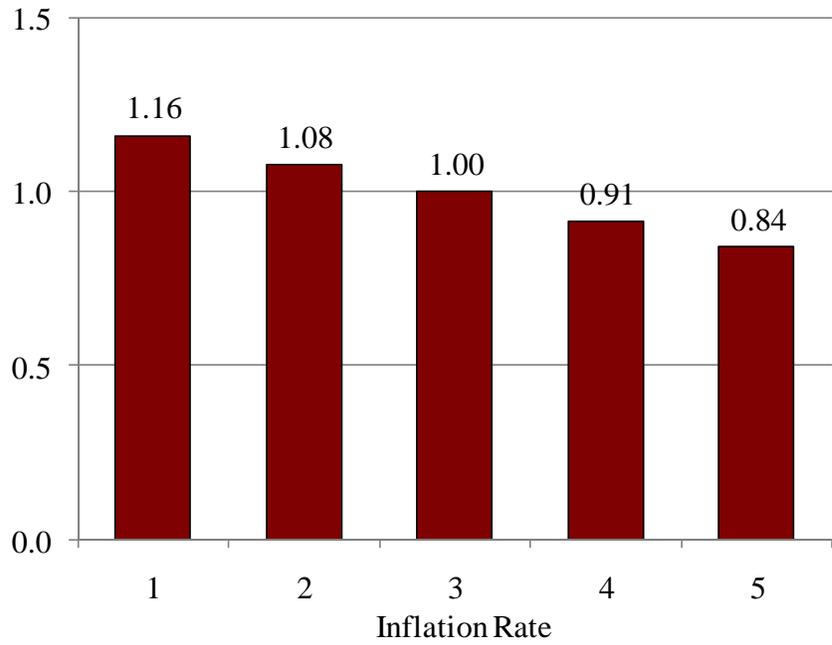
Figure 7. *Increase in Lifetime Pension Benefit for Another Year of Work as a Percentage of Net Earnings, 4-Percent Discount Rate*
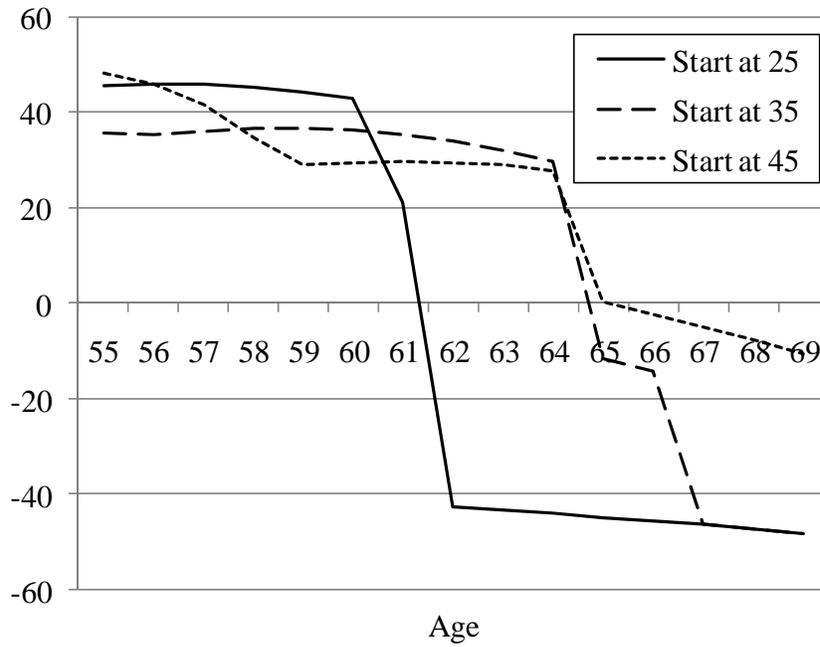

Figure 8. *Increase in Lifetime Pension Benefit for Another Year of Work as a Percentage of Net Earnings, for Employee Starting Service at Age 25, 4-Percent Discount Rate*
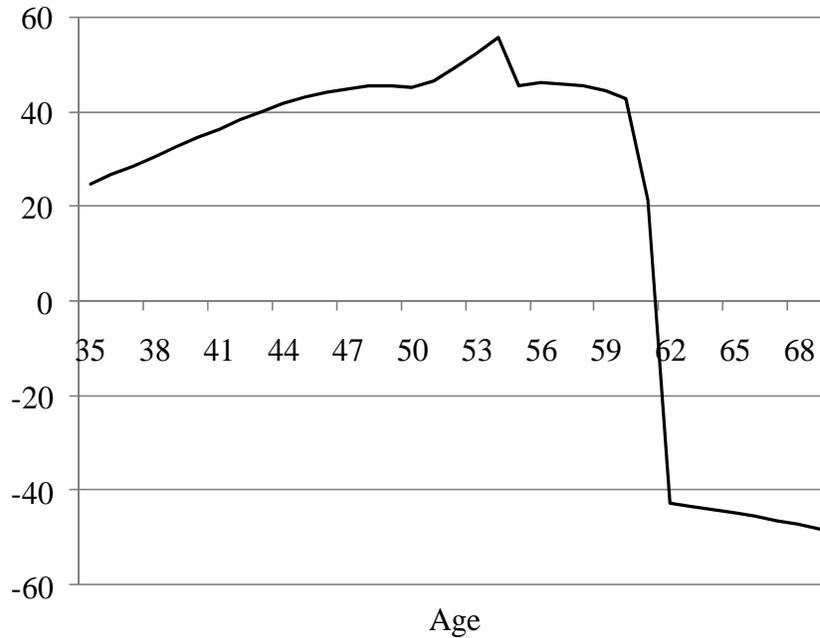
Note: Calculations include vested terminations prior to age 55.

Figure 9A. *Pension Incentive to Return for Three Years After a Gap, By Age of Departure and Age of Return, 4-Percent Discount Rate*


Age out of service
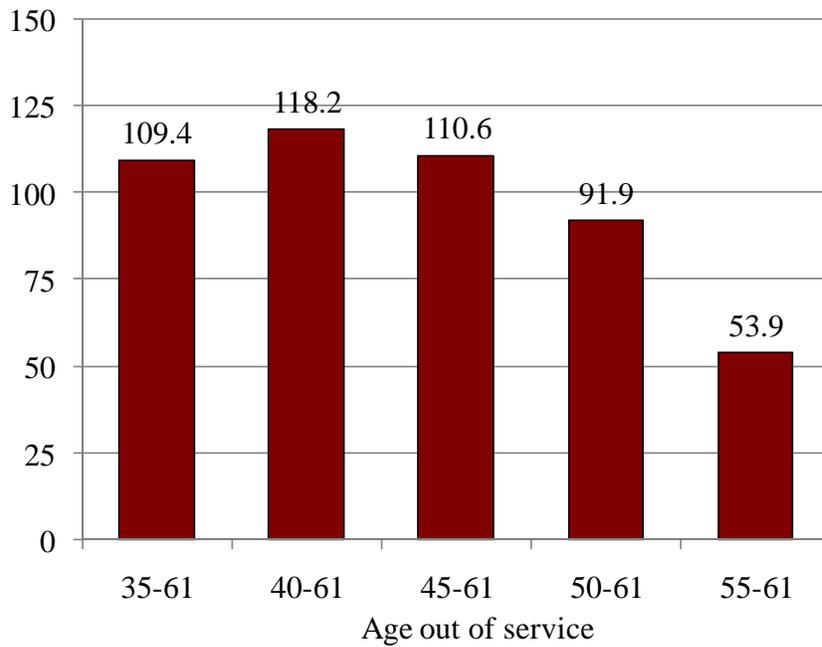
Figure 9B. *Pension Incentive to Return for Three Years After a Gap, By Age of Departure and Age of Return, 8-Percent Discount Rate*


Age out of service
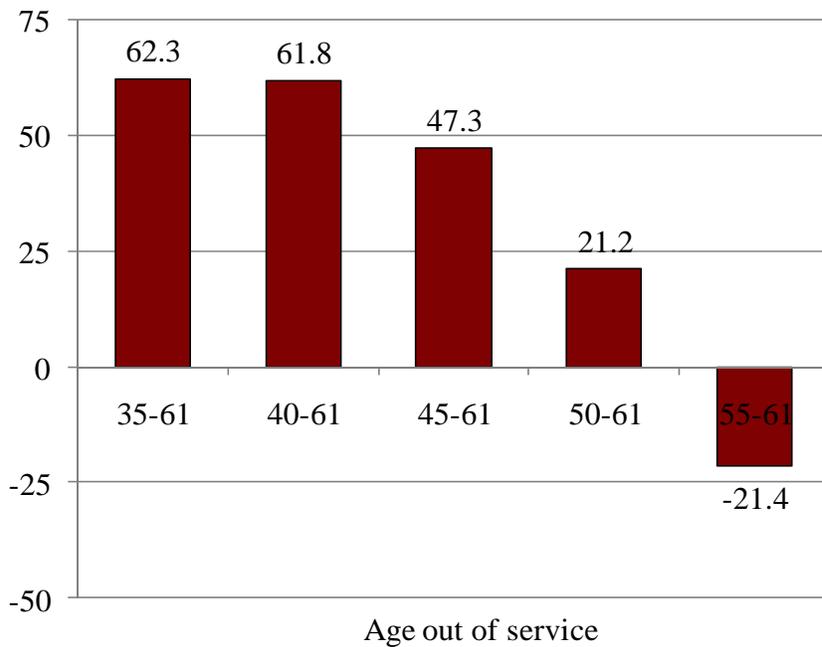
Figure 10. *Increase in Lifetime Pension Benefit for Another Year of Work as a Percentage of Net Earnings, with and without Retirement Plus, 4-Percent Discount Rate*
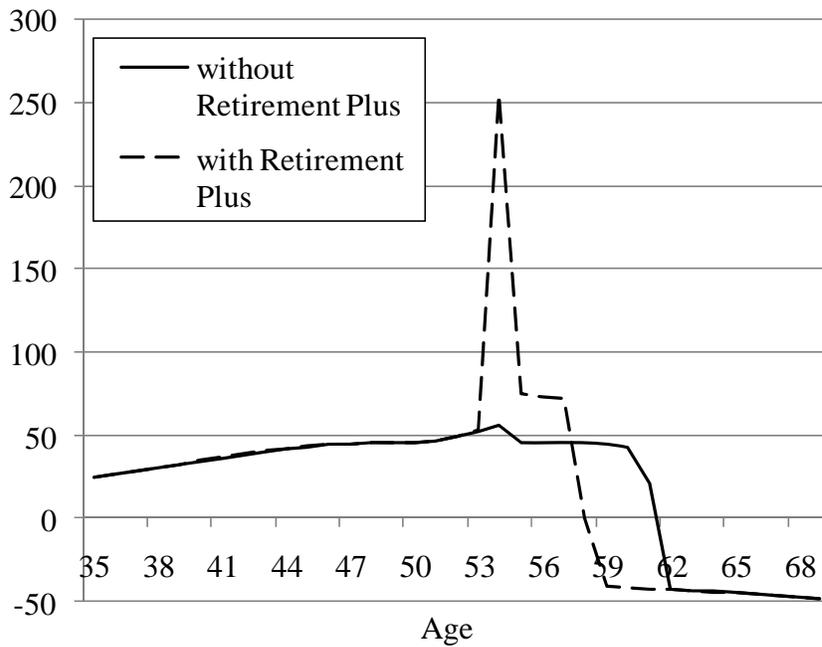

Figure 11. *Present Value of Termination and Superannuation Allowances By Age at Separation, in Thousands of Dollars, 4-Percent Discount Rate*