Fairfax County Retirement Systems

CHEIRON

Classic Values, Innovative Advice

PORS and URS Service Purchase Calculator

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Types and Costs of Service

- Purchasing service that was worked under one of the FX Systems requires payment of **member contributions only**
  - Liability for this service has already been measured and is part of the System's funding measurements
- Purchase of service worked outside of the FX Systems requires payment of the **entire increase in liability**
  - Code requires that the grant of external service should not make the System's unfunded liability any better or worse than before the purchase
  - This is the basis for portable service from VRS

Ordinance Change

- **Effective no later than July 1, 2024, active members may purchase up to 4 years of**
  - Law enforcement service worked at another federal, state or local government **(PORS and specific URS)**, or
  - Prior active-duty military service **(PORS and URS)**

- Service purchased shall apply to
  - Calculation of the retirement allowance
  - Calculation of retirement eligibility

- The member shall be responsible for paying the full cost of such purchase, including any increase in cost due to the timing of payments

Assumptions Used

- Since the valuation of any service purchase involves comparing eventual benefits to be paid from the System, some projection is required

- Key assumptions are that
  - Member will retire when **first** eligible (generally 25 years)
  - Current pay will increase at the rate of 2.25% per year
  - Present value of benefits calculated using the current assumptions for actuarial equivalence
    - Interest at 6.75% (based on projected annual investment returns)
    - Mortality based on a unisex blend of the tables most recently adopted by the Board of Trustees
    - Future annual COLAs at 2.1% per year from commencement forward

Steps to the Calculation Model

- Step 1 – calculate the normal retirement both with and without the service purchase
- Step 2 – project the years of service at normal retirement
- Step 3 – project salary to normal retirement
- Step 4 – convert salary to the final average salary used in the benefit calculation
- Step 5 – calculate the projected normal retirement benefit
- Step 6 – Apply the appropriate present value factor to each projected benefit
- Step 7 – the cost is equal to the difference in present values calculated under step 6

Sample Calculation

- The calculator takes into account the provisions of each of the PORS and URS plans
- For purposes of a simple calculation, we will use PORS Plan C
- Sample member has the following characteristics

Age	25
Service	0 years
Salary	$100,000

Purchase of 4 years of Military Service

	No Purchase	With 4-years
Age at Purchase	25	25
Service in System	0	0
Military Service	0	4
1. Retirement Age	50	46
2. Service at Retirement	25	25
3. Salary at Retirement (use 2.25%)	$174,415	$159,562
3. Convert to Final Average Salary	$170,605	$156,077
4. Proj. Benefit (per Plan Provisions)	$119,423	$109,254
5. Present Value Factor	3.2247	4.4197
6. Present Value (4. x 5.)	$385,101	$482,873
7. Cost of Purchase (difference in step 6 amounts)		$97,772
8. Salary in 2024		$100,000
9. Cost as % of Salary (7. ÷ 8.)		98%

- Payment is for retirement 4 years earlier and the value of 4 years of service being purchased
- Benefit amount is lower with service purchase due to salary missing out on 4 years of increase
- Present value with purchase is higher due to retirement at age 46 versus age 50
- The net impact is an increase in the measurement of liability

Calculation 15 Years Later

(Assume $100,000 starting salary has grown with 15 years of 2.25%)	No Purchase	With 4-years
Age at Purchase	40	40
Service in System	15	15
Military Service	0	4
1. Retirement Age	50	46
2. Service at Retirement	25	25
3. Salary at Retirement (use 2.25%)	$174,415	$159,562
3. Convert to Final Average Salary	$170,605	$156,077
4. Proj. Benefit (per Plan Provisions)	$119,423	$109,254
5. Present Value Factor	8.6649	11.8762
6. Present Value (4. x 5.)	$1,034,797	$1,297,518
7. Cost of Purchase (difference in step 6 amounts)		$262,720
8. Salary in 2024		$139,621
9. Cost as % of Salary (7. ÷ 8.)		188%

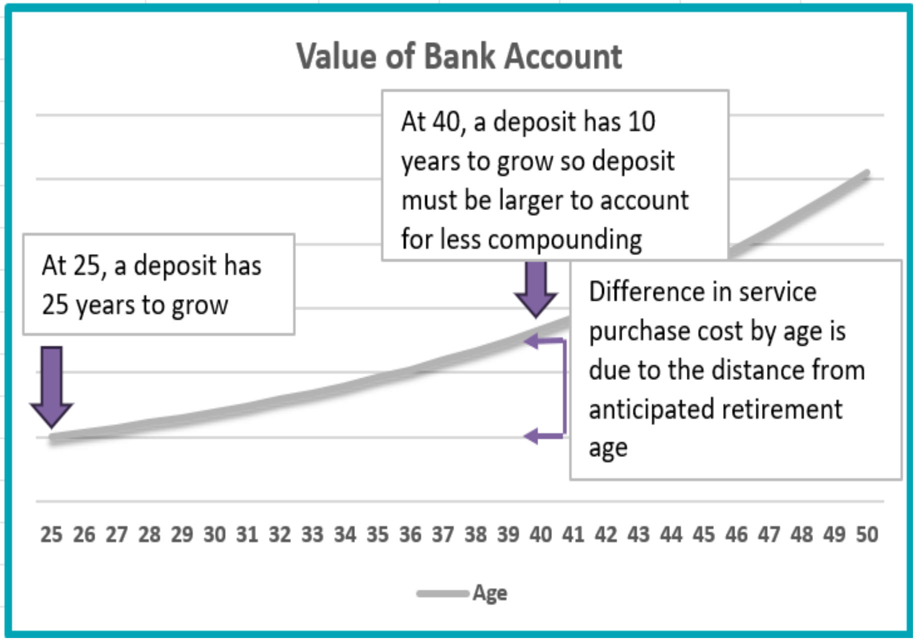
- Cost has almost doubled as a % of salary, what it was with no prior service
- That is because the 15 years of service already accrued is now more valuable due to the earlier retirement age
- The present value factors are higher since retirement is now 10 (or 6) years away instead of 25 (or 21) years away as it was at hire

Present Value Factors

- These are developed in accordance with the System's state assumptions about mortality, interest and COLAs
- They reflect the value today of a payment of $1 per year commencing as of the projected retirement date
- The calculation is fairly complicated and involves using the probability that the member will be alive in each year of the payout, the payments increasing by COLA, and this projected stream being discounted at 6.75%

Concept of Discounting

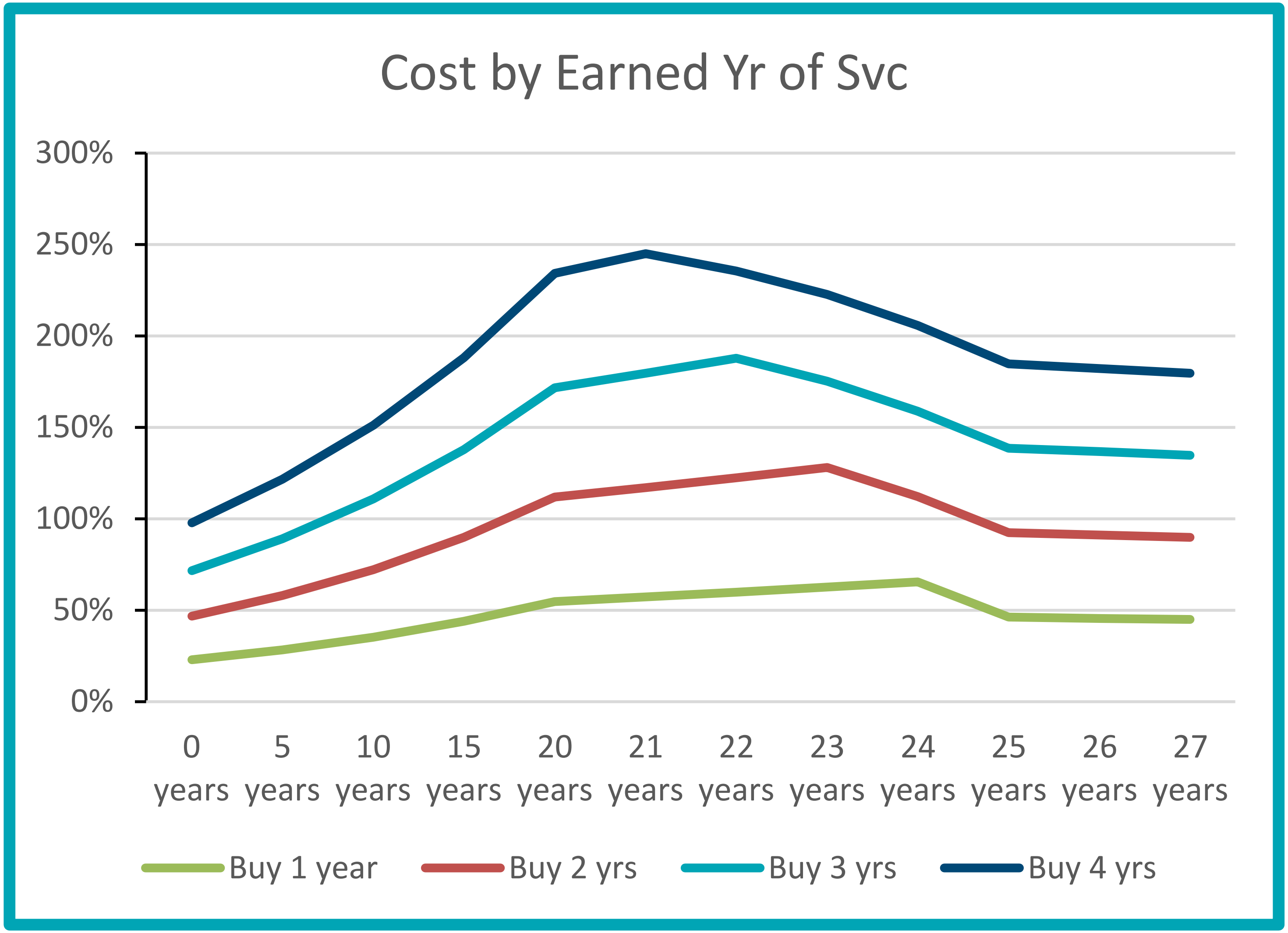
- Discounting is the reverse of a compounding increase in value
- Look at Bank account as an illustration of compound increases
- Discounting is asking the question, how much money would I need to put in a bank today so that it will grow to the amount needed to pay benefits by retirement
- The longer you have to grow the money, the less you need to put in the bank to reach the goal



Calculate 25 Years After Hire

(Assume $100,000 starting salary has grown with 25 years of 2.25%)	No Purchase	Purchase 4-years
Age at Purchase	50	50
Service in System	25	25
Military Service	0	4
1. Retirement Age	50	50
2. Service at Retirement	25	29
3. Salary at Retirement	$174,415	$174,415
3. Convert to Final Average Salary	$170,605	$170,605
4. Proj. Benefit (per Plan Provisions)	$119,423	$136,531
5. Present Value Factor	16.8562	16.8562
6. Present Value (4. x 5.)	$2,013,020	$2,335,103
7. Cost of Purchase (difference in step 6 amounts)		$322,083
8. Salary in 2024		$174,415
9. Cost as % of Salary (7. ÷ 8.)		184%

- The cost as % of salary is lower than with 15 years of service
- When a member is already eligible to retire there is no change in the "present value factor"
- The cost reflects only the higher benefit that is payable (i.e., Projected Benefit) due to the 4 years being added to pensionable service
- The per-year cost as a % of salary will increase as the member has more and more service but only up until reaching 21 years of service
  - After that, the 4 years will buy diminishing earlier retirement eligibility



Shown as % of salary for someone hired to PORS Plan C at age 25

Required Disclosures

The purpose of this presentation is to discuss the calculation of military service purchase calculations for members of the Fairfax County Retirement System PORS and URS.

In preparing our presentation, we relied on information supplied by the Fairfax County Retirement Administration Agency. This information includes, but is not limited to, the Plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with the Actuarial Standard of Practice No. 23.

This presentation and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices, and our understanding of the Code of Professional Conduct, and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board, as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this presentation. This presentation does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This presentation was prepared exclusively for the Fairfax County Retirement Systems for the purpose described herein. This presentation is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

The assumptions reflect our understanding of the likely future experience of the Systems, and the assumptions as a whole represent our best estimate for the future experience of the Systems. The results of this presentation are dependent upon future experience conforming to these assumptions. To the extent that future experience deviates from the actuarial assumptions, the true cost of the service purchased may vary from our results.

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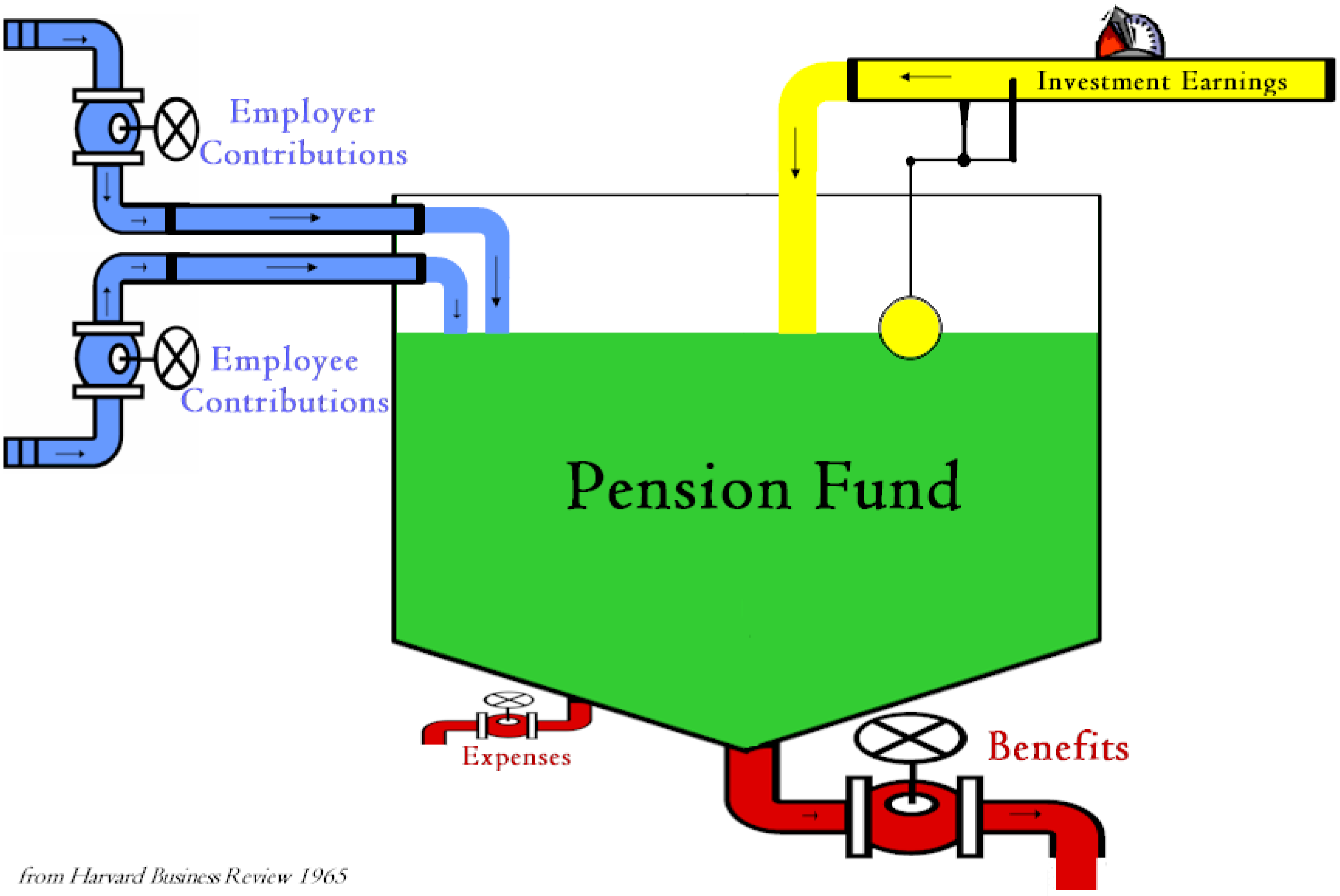
Appendix 1

Funding Illustration

Pension Plan Funding

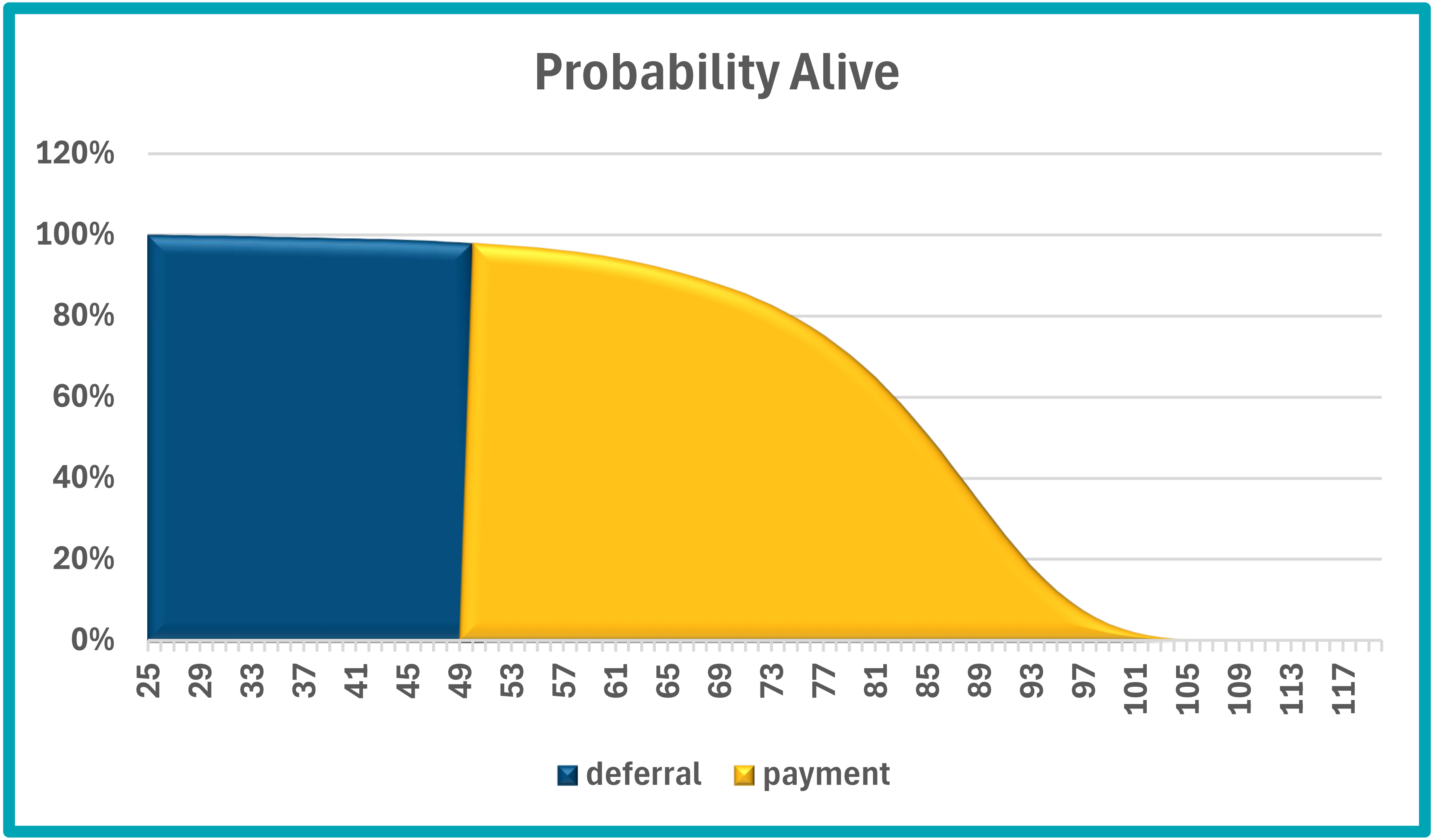


from Harvard Business Review 1965

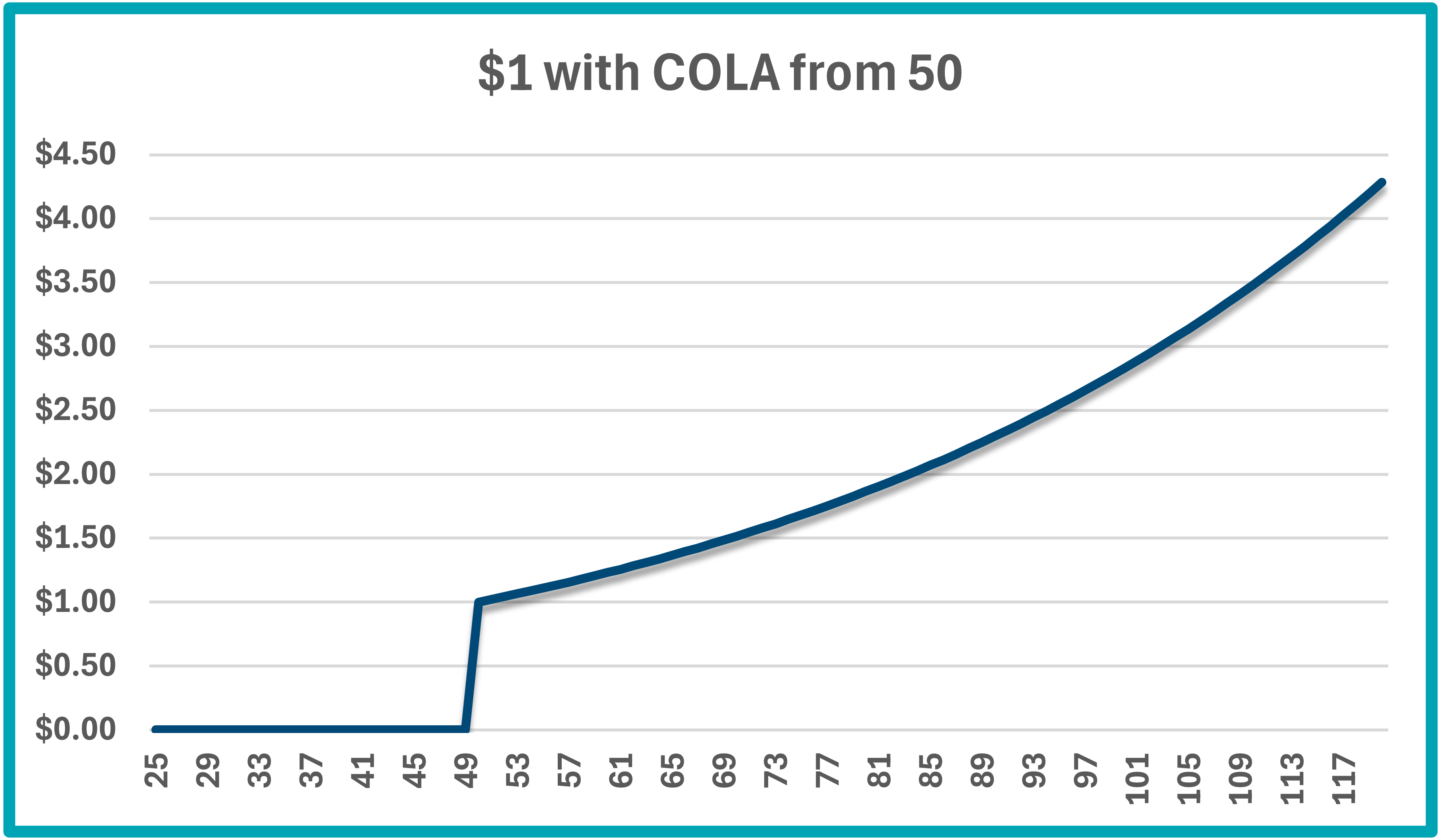
Appendix 2

Present Value Factors Development

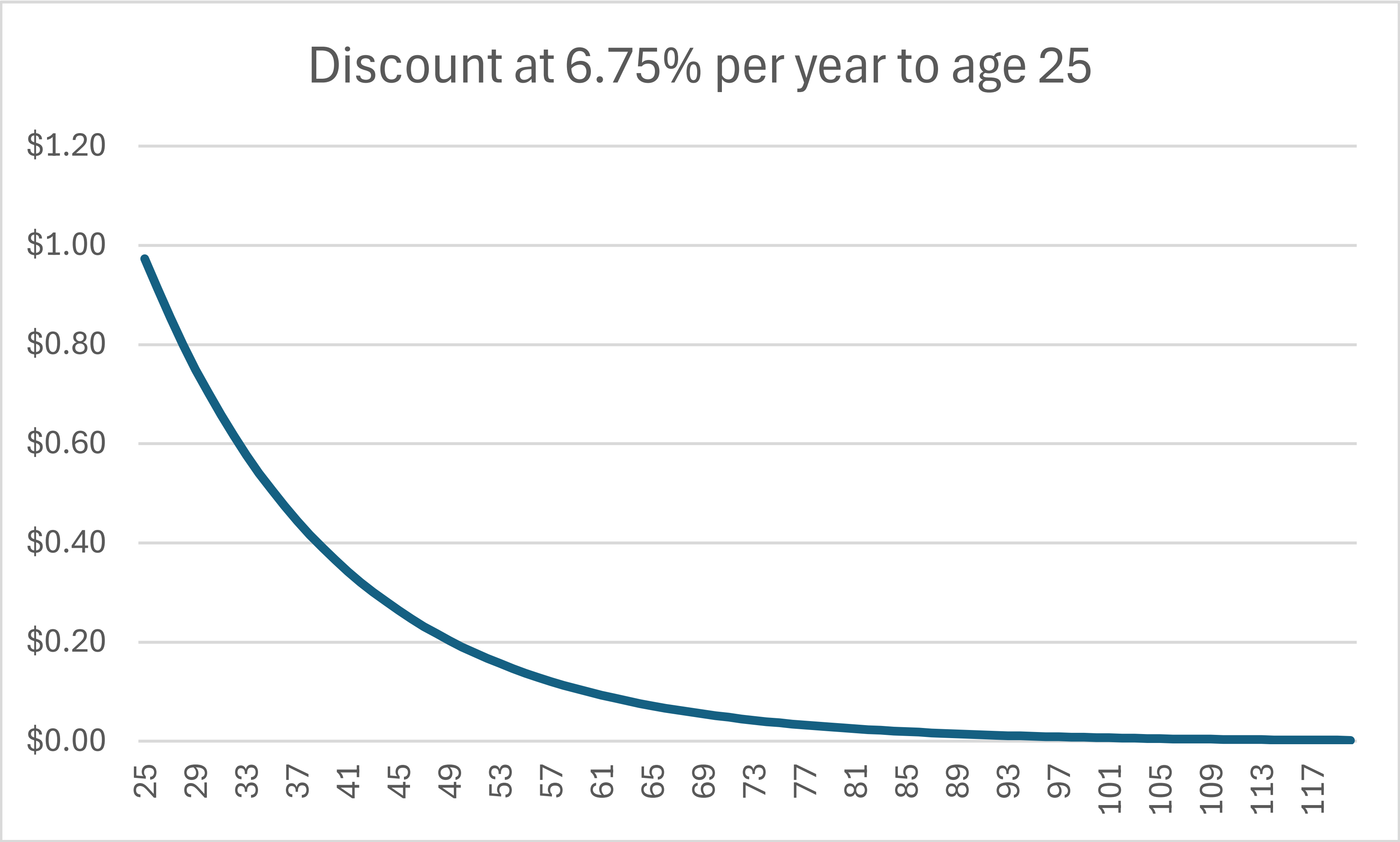
Steps to Calculate Present Value Factor



Project Benefit Using COLA Assumption



Discount Factors at Each Age



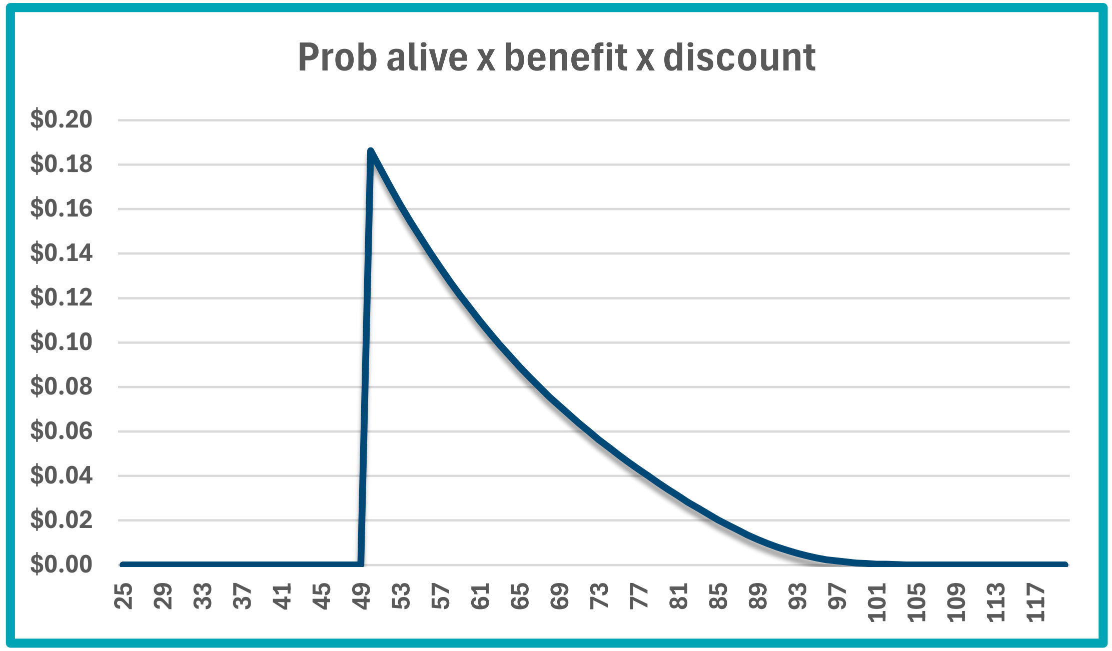
Putting the Pieces Together

Multiply the last three amounts together to develop the probability of payment in each year, times the anticipated benefit and reduced back to age 25 using the discount rate.

Adding up the results across all ages shown results in the 3.2247 factor in the first column of slide 6.

Redoing this math with a benefit commencement age of 46 results in the 4.4197 factor in the second column of slide 6.

Column 2 is a higher number since the benefit starts 4 years earlier.



Estimation of Factor

- The actuarial calculation includes some adjustments to recognize payments are made monthly
- A shortcut to get near the same result could be to use an interest only present value factor to the expected average lifetime and then discount that back to age 25 with interest and mortality
- Example: PV using 4.33% (1.0675/1.021-1) and the expected lifetime to 82.75 we get a factor at age 50 of 16.86
- Probability of being alive from age 25 to age 50 is 97.93% and the discount using 6.75% for the 25 years from age 25 to 50 is 19.53%
- PV factor is then 16.86 x 97.93% x 19.53% = 3.225