

# Dear Actuary:



I will be retiring next month after working 30 years as a school custodian. On my pension statement, I can select either \$1,200 per month payable only to me or \$900 per month payable to both me and my spouse. Both options are “actuarially equivalent,” which I am told means that they are the same. I am no math whiz but \$900 is a lot less than \$1,200 per month! How can they be the same? If they are the same, which one do I choose?

—Confused in Concord

## Dear Confused:

Congratulations on your upcoming retirement! This is a great question. Oftentimes, people struggle to understand their pension benefits in order to decide which benefit option to select at retirement.

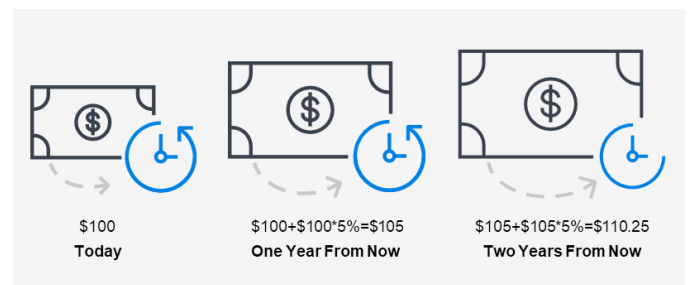
Let's start with the obvious—yes, you are correct that \$900 per month is less than \$1,200 per month. Although the two options are not equal in dollar amount, they are considered “actuarially equivalent” because with either choice you are expected to receive the same value of benefits from the pension plan over the lifetimes of you and your spouse. In math terms, we say that the options have the same “present value.” The present value of your monthly benefit is equal to the value in today's dollars of all your future expected monthly benefit payments. There are three main factors that go into this calculation:

- The time value of money: How does \$1 today compare to \$1 a year from now, or 10 years from now? This is determined using a specific interest rate
- How long are you and your spouse expected to be alive and receiving payments? This is determined using a specific mortality table.
- What benefits, if any, will be paid to your spouse after your death?

Let's first consider the time value of money. You have probably heard the saying “a dollar received today is worth more than a dollar received tomorrow.” That is because a dollar received today has more earning power and when invested should be worth more tomorrow. In addition, a dollar can be used to purchase more goods and services today due to the likely effect of inflation on

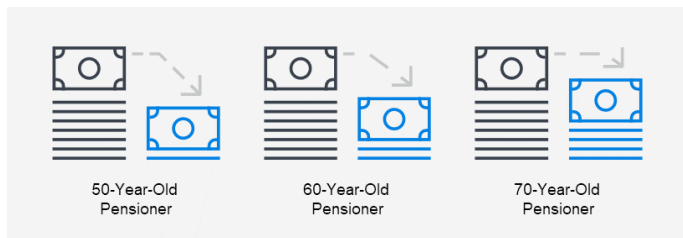
tomorrow's prices. Let's say I gave you the option of receiving \$100 today or \$100 one year from today. Which option would you choose? If you choose to receive \$100 today and deposit it into an account that earns 5% per year, you would have \$105 one year from now. That is certainly better than waiting to receive \$100 one year from now! In other words, the present value of a \$105 payment one year from now is \$100. In this example, the bank's interest rate is 5%. Similarly, your pension plan also uses a specific interest rate to calculate the value in today's dollars of the benefit payments you are expected to receive in the future. This interest rate is specified in the pension plan document. If you are unsure where to find it, speak with your Human Resources (HR) representative. Figure 1 illustrates the time value of money.

FIGURE 1: TIME VALUE OF MONEY



The next consideration is how long you are expected to live (your “life expectancy”). All else being equal, the monthly benefit for a younger retiree might be smaller to take into account that payments are expected to be made over a longer period of time, compared to a bigger monthly benefit for an older retiree with a shorter life expectancy. This is illustrated in Figure 2.

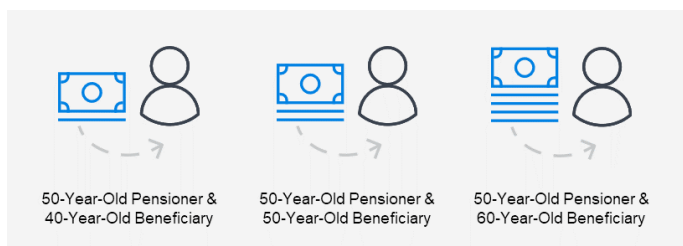
**FIGURE 2: SINGLE LIFE ANNUITY PAYMENTS TO PENSIONERS AT DIFFERENT AGES\***



\* Except for age, each pensioner is assumed to work the same number of years with similar compensation.

The final factor that affects the present value is the benefit that is paid to your spouse after your death. For example, a “single life annuity” is paid only for your lifetime and stops upon your death. On the other hand, a “joint life annuity” or “joint and survivor annuity” is paid to you during your lifetime, but upon your death payments continue to your spouse for the rest of your spouse’s lifetime. Therefore, a joint life annuity is based on the life expectancy of both you *and* your spouse. Consequently, the monthly benefit for a joint life annuity is reduced to take into account that it is expected to be paid over a longer period of time than a single life annuity. If your spouse is very young, with a longer life expectancy, then the monthly benefit will be reduced more, compared to an older spouse with a shorter life expectancy. This is illustrated in Figure 3.

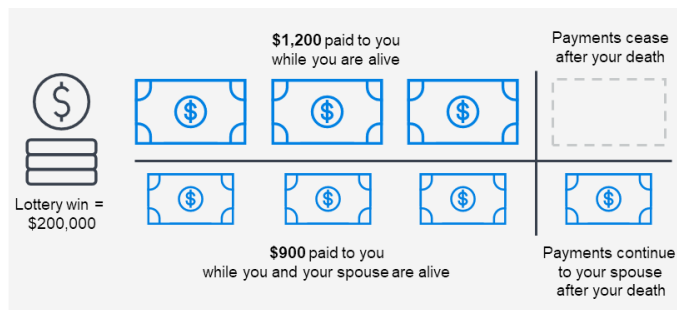
**FIGURE 3: SAME JOINT LIFE ANNUITY PAYMENTS TO PENSIONERS AT DIFFERENT AGES\***



\* Except for age, each pensioner is assumed to work the same number of years with similar compensation.

Think of the present value as winning the lottery. Let’s say that you won the lottery jackpot of \$200,000. Today, you can collect your winnings equal to \$200,000, or you can receive equal installments of \$1,200 per month for the rest of your life, or you can receive \$900 per month for the rest of your life and for the rest of your spouse’s life. This is shown in Figure 4.

**FIGURE 4: SINGLE LUMP SUM OF FUTURE STREAM OF PAYMENTS**



I’ve only talked about the two options that you raised in your letter, but there is a wide variety of annuity options offered by different pension plans.

Because both of the options being offered to you are actuarially equivalent, neither one is “better” than the other. You should make your choice based on the specifics of your own personal health, financial, and tax situation. Please consult with your financial and tax advisor(s), who will assist you with making the right decision. Good luck!

**Your Milliman Actuary**

P.S. Thanks so much to Kerry Forrester, FSA for providing the information I need to understand the differences in pension benefit options.



Milliman is among the world’s largest providers of actuarial and related products and services. The firm has consulting practices in life insurance and financial services, property & casualty insurance, healthcare, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

[milliman.com](http://milliman.com)

For more information about defined benefit pension plans, see prior letters [here](#).

Do you have a question about your defined benefit pension plan? Write to us at [dear.actuary@milliman.com](mailto:dear.actuary@milliman.com).