JARGON ALERT

Present Value

BY KARL RHODES

The Jumbo Lotto jackpot hit $500 million, and someone bought the winning ticket, but no one has come forward. A week goes by and still no winner emerges. What's taking so long?

West Virginia billionaire Lucky Ducky has the winning ticket, but he's trying to determine the best way to collect his money. Should he take one lump sum of $334.1 million now — or 30 annual payments of $16.67 million that would add up to $500 million over 29 years? (The 30 payments would span 29 years because he would receive the first payment on day one.)

Ducky's analysis begins with the Jumbo Lotto's calculation of present value, an estimate of how much the 30 payments over time would be worth on day one. The lottery has determined that the present value of the 30 payments is $334.1 million. Using the present-value formula, Ducky discovers that the lottery has based its calculation on an interest rate of 1.4 percent. In other words, if he took the lump sum and invested it at 1.4 percent compounded annually, he would end up with $500 million in 29 years.

"When accountants compute the present value of future cash flows, all they are really doing is mathematically backing out the interest for that period of time," says Joe Hoyle, an accounting professor at the University of Richmond. The key is deciding which interest rate to employ.

Ducky feels certain he can do better than 1.4 percent. His portfolio of corporate bonds has been generating an average annual return of 6 percent over many years. So it would seem clear that he should take the lump sum. But Ducky realizes that the lottery's present-value calculation is only a starting point. What about income taxes? What about the potential returns on investing the 30 annual payments as he receives them? When he factors in combined federal and state taxes of 49.9 percent and expected annual returns of 6 percent, the 30-payments option generates $397.6 million over 29 years, while the lump-sum option produces $395.1 million during that time. So the 30 payments generate $2.5 million more, but is that worth the wait?

At this point, Ducky turns to his team of accountants, attorneys, and economists, but they only raise more questions. Does he want to make large charitable contributions at some point? Does he expect taxes to go up or down? What about interest rates? What about inflation?

Present-value analysis can be tricky, even when the future income stream being discounted is as predictable as annual lottery payments. Most people will never win the lottery, but present-value analysis helps individuals and corporations evaluate trade-offs between receiving payments now versus receiving them later. Decisions about pension plan payouts, for example, are similar to Ducky's dilemma. A prospective retiree could use present-value analysis to help her determine whether it would be better to take a lump sum now or monthly payments for the rest of her life. In this context, the analysis raises a vitally important question: How long does she expect to live?

Life expectancy also is important when corporations use present value to evaluate potential investments. For example, if a regulated utility is thinking about building a nuclear power plant, the company would estimate the annual cash flows that the plant would produce over the course of its useful life. The utility would choose a life span and an interest rate (perhaps its regulated rate of return) to determine whether the present value of the proposed plant's cash flows would exceed the cost of building it.

But in the nuclear power plant example, yet another important consideration looms. How much would it cost to clean up the plant at the end of its useful life? This question takes the capital-budgeting exercise beyond mere present value to the more comprehensive concept of net present value. To calculate the net present value, the utility must compare the present value of the plant's future cash inflows to the present value of its future cash outflows — including the costs of building, operating, and winding down the plant.

"If the present value of the cash inflows is greater than the present value of the cash outflows, then the proposed plant has a positive net present value, and you assume that it is a good investment," Hoyle says.

Compared with the uncertainties of investing in a nuclear power plant, Ducky's present-value analysis seems pretty simple. Ultimately, he decides to take the lump sum and pay the taxes up front because he thinks the top federal income tax rate is likely to increase during the next 29 years. He also expects greater inflation and higher real interest rates. Ducky's analysis shows that if historically low rates of interest, inflation, and taxation persist, the 30 payments would generate $2.5 million more than the lump-sum distribution, but he is willing to wager that one or more of those rates will rise significantly, making the lump-sum option the better bet. **EF**

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