

AN INVESTOR WILL RECEIVE AN ANNUITY OF \$4,000 A YEAR FOR TEN YEARS. THE FIRST PAYMENT IS TO BE RECEIVED

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UNDERSTANDING ANNUITIES IS FUNDAMENTAL FOR INVESTORS PLANNING THEIR LONG-TERM FINANCIAL SECURITY. WHEN AN INVESTOR IS PROMISED A FIXED ANNUAL PAYMENT OVER A SPECIFIED PERIOD, SUCH AS RECEIVING \$4,000 ANNUALLY FOR TEN YEARS, IT INTRODUCES IMPORTANT CONSIDERATIONS AROUND VALUATION, INTEREST RATES, AND FINANCIAL PLANNING. THIS ARTICLE EXPLORES THE CONCEPT OF ANNUITIES, HOW TO EVALUATE THEIR PRESENT VALUE, THE SIGNIFICANCE OF THE FIRST PAYMENT, AND HOW SUCH ARRANGEMENTS IMPACT AN INVESTOR'S FINANCIAL STRATEGY.

WHAT IS AN ANNUITY? A BASIC OVERVIEW

AN ANNUITY IS A FINANCIAL PRODUCT THAT PROVIDES A SERIES OF PAYMENTS MADE AT EQUAL INTERVALS. THESE ARE OFTEN USED FOR RETIREMENT INCOME, INSURANCE SETTLEMENTS, OR OTHER LONG-TERM FINANCIAL ARRANGEMENTS. ANNUITIES CAN BE STRUCTURED IN VARIOUS WAYS, BUT THE CORE IDEA REMAINS THE SAME: A SERIES OF CASH FLOWS OVER TIME.

TYPES OF ANNUITIES:

- ORDINARY ANNUITY: PAYMENTS ARE MADE AT THE END OF EACH PERIOD.
- ANNUITY DUE: PAYMENTS ARE MADE AT THE BEGINNING OF EACH PERIOD.
- FIXED ANNUITY: PAYMENTS ARE FIXED AND PREDETERMINED.
- VARIABLE ANNUITY: PAYMENTS VARY BASED ON INVESTMENT PERFORMANCE.

IN OUR SCENARIO, THE INVESTOR RECEIVES A FIXED AMOUNT OF \$4,000 ANNUALLY FOR TEN YEARS. WHETHER THIS IS AN ORDINARY ANNUITY OR AN ANNUITY DUE AFFECTS THE VALUATION AND PLANNING.

KEY COMPONENTS OF THE ANNUITY SCENARIO

BEFORE DELVING INTO CALCULATIONS, IT'S ESSENTIAL TO UNDERSTAND THE SPECIFIC FEATURES OF THIS ANNUITY:

- PAYMENT AMOUNT: \$4,000 ANNUALLY.
- NUMBER OF PAYMENTS: 10 YEARS.
- PAYMENT TIMING: THE FIRST PAYMENT IS TO BE RECEIVED IMMEDIATELY (ASSUMING THE FIRST PAYMENT IS AT THE START OF THE PERIOD, I.E., AN ANNUITY DUE).
- INTEREST RATE: NOT SPECIFIED, BUT CRUCIAL FOR VALUATION; ASSUMPTIONS OR MARKET RATES ARE OFTEN USED.
- PURPOSE: TYPICALLY FOR INCOME PLANNING, INVESTMENT VALUATION, OR RETIREMENT FUNDING.

UNDERSTANDING THE TIMING OF PAYMENTS

THE TIMING OF THE FIRST PAYMENT SIGNIFICANTLY INFLUENCES THE PRESENT VALUE CALCULATION:

- If the first payment occurs immediately: The annuity is an annuity due.
- If the first payment occurs at the end of the first period: The annuity is an ordinary annuity.

Given the statement, "The first payment is to be received," it suggests the first payment is immediate, indicating an annuity due.

CALCULATING THE PRESENT VALUE OF THE ANNUITY

The fundamental concept in valuing an annuity is determining its present value (PV)—the current worth of all future payments discounted at a specific rate. This allows investors to compare the value of the annuity to other investment options or to understand its worth today.

FACTORS AFFECTING PRESENT VALUE

- Payment amount: \$4,000
- Number of payments: 10
- Payment timing: beginning of each period
- Discount rate: denoted as r , which reflects the opportunity cost or market interest rates

PRESENT VALUE OF AN ANNUITY DUE

The formula for the present value of an annuity due is:

$$[PV = P \times \left(\frac{1 - (1 + r)^{-N}}{r} \right) \times (1 + r)]$$

Where:

- (P) = Payment amount per period (\$4,000)
- (r) = Periodic interest rate
- (N) = Total number of payments (10)

This formula adjusts the ordinary annuity PV formula by multiplying by $(1 + r)$ to account for the payments being received at the beginning of each period.

EXAMPLE CALCULATION WITH ASSUMED INTEREST RATE

Suppose the prevailing market interest rate is 5% annually.

- $(P = 4,000)$
- $(r = 0.05)$
- $(N = 10)$

Calculating the PV:

$$[PV = 4,000 \times \left(\frac{1 - (1 + 0.05)^{-10}}{0.05} \right) \times (1 + 0.05)]$$

First, compute $(1 + 0.05)^{-10}$:

$$[(1.05)^{-10} \approx 0.6139]$$

Then:

$$[1 - 0.6139 = 0.3861]$$

NEXT, DIVIDE BY (0.05) :

$$[0.3861 / 0.05 = 7.722]$$

MULTIPLY BY $(4,000)$:

$$[4,000 \times 7.722 = 30,888]$$

FINALLY, MULTIPLY BY (1.05) :

$$[30,888 \times 1.05 \approx 32,432.40]$$

RESULT: THE PRESENT VALUE OF RECEIVING \$4,000 ANNUALLY FOR 10 YEARS, STARTING IMMEDIATELY, AT 5% INTEREST, IS APPROXIMATELY \$32,432.40.

IMPLICATIONS FOR INVESTORS

UNDERSTANDING THE PRESENT VALUE HELPS INVESTORS DECIDE WHETHER THE ANNUITY OFFERS A FAIR OR ATTRACTIVE VALUE COMPARED TO OTHER INVESTMENT OPPORTUNITIES. IT ALSO ASSISTS IN PLANNING FUTURE CASH FLOWS, RETIREMENT GOALS, AND RISK MANAGEMENT.

KEY CONSIDERATIONS INCLUDE:

- INTEREST RATE ASSUMPTIONS: THE VALUATION HEAVILY DEPENDS ON THE DISCOUNT RATE USED. HIGHER RATES DECREASE PRESENT VALUE, AND VICE VERSA.
- PAYMENT TIMING: RECEIVING THE FIRST PAYMENT IMMEDIATELY (ANNUITY DUE) INCREASES THE PRESENT VALUE COMPARED TO AN ORDINARY ANNUITY.
- INFLATION IMPACT: OVER TEN YEARS, INFLATION CAN ERODE THE REAL VALUE OF FIXED PAYMENTS UNLESS ADJUSTMENTS ARE MADE.
- TAX IMPLICATIONS: DEPENDING ON JURISDICTION, ANNUITY PAYMENTS MAY BE TAXABLE, AFFECTING NET INCOME.

FACTORS INFLUENCING THE CHOICE OF ANNUITY TYPE

INVESTORS SHOULD EVALUATE WHETHER AN ANNUITY DUE OR ORDINARY ANNUITY SUITS THEIR FINANCIAL GOALS. ANNUITY DUE PROVIDES EARLIER ACCESS TO FUNDS, WHICH CAN BE ADVANTAGEOUS FOR IMMEDIATE NEEDS BUT MAY HAVE DIFFERENT TAX OR PLANNING IMPLICATIONS.

BENEFITS OF AN ANNUITY DUE:

- HIGHER PRESENT VALUE COMPARED TO AN ORDINARY ANNUITY AT THE SAME RATE.
- IMMEDIATE CASH FLOWS, USEFUL FOR COVERING CURRENT EXPENSES.
- BETTER SUITED FOR INCOME STREAMS INTENDED TO START RIGHT AWAY.

DRAWBACKS:

- TYPICALLY REQUIRES HIGHER INITIAL INVESTMENT OR VALUATION.
- MAY HAVE LESS FLEXIBILITY IN CERTAIN CONTRACTUAL ARRANGEMENTS.

ADDITIONAL CONSIDERATIONS FOR INVESTORS

WHEN EVALUATING SUCH AN ANNUITY, INVESTORS SHOULD CONSIDER:

- MARKET CONDITIONS: FLUCTUATIONS IN INTEREST RATES CAN AFFECT THE VALUATION.
- INFLATION: FIXED PAYMENTS MAY LOSE PURCHASING POWER IF INFLATION RISES.
- ALTERNATIVE INVESTMENTS: COMPARING THE ANNUITY'S PRESENT VALUE WITH OTHER INVESTMENT OPTIONS.
- DURATION AND TERM: THE TEN-YEAR PERIOD ALIGNS WITH SPECIFIC FINANCIAL GOALS, SUCH AS RETIREMENT PLANNING OR DEBT REPAYMENT SCHEDULES.
- TAXATION AND LEGAL FRAMEWORK: UNDERSTANDING LOCAL LAWS AFFECTING ANNUITY PAYMENTS.

CONCLUSION

AN INVESTOR RECEIVING AN ANNUITY OF \$4,000 A YEAR FOR TEN YEARS, WITH THE FIRST PAYMENT RECEIVED IMMEDIATELY, IS ENGAGING IN A FINANCIAL ARRANGEMENT WITH PREDICTABLE CASH FLOWS. THE VALUATION OF THIS ANNUITY DEPENDS ON THE DISCOUNT RATE, PAYMENT TIMING, AND OTHER MARKET FACTORS.

BY CALCULATING THE PRESENT VALUE, INVESTORS CAN ASSESS THE WORTH OF THIS ARRANGEMENT IN TODAY'S DOLLARS AND COMPARE IT TO ALTERNATIVE INVESTMENTS. UNDERSTANDING THE NUANCES OF ANNUITIES, INCLUDING THE DIFFERENCE BETWEEN ANNUITY DUE AND ORDINARY ANNUITY, EMPOWERS INVESTORS TO MAKE INFORMED DECISIONS ALIGNED WITH THEIR FINANCIAL GOALS.

IN CONCLUSION, WHETHER PLANNING FOR RETIREMENT, FUNDING A PROJECT, OR MANAGING LEGACY INCOME, APPRECIATING THE DETAILS OF SUCH ANNUITIES ENSURES BETTER FINANCIAL PLANNING AND OPTIMIZED INVESTMENT STRATEGIES.

FREQUENTLY ASKED QUESTIONS

WHAT IS THE PRESENT VALUE OF AN ANNUITY THAT PAYS \$4,000 ANNUALLY FOR TEN YEARS IF THE DISCOUNT RATE IS 5%?

THE PRESENT VALUE CAN BE CALCULATED USING THE PRESENT VALUE OF AN ORDINARY ANNUITY FORMULA. $PV = P [(1 - (1 + r)^{-n}) / r]$, WHERE $P = \$4,000$, $r = 0.05$, $n = 10$. PLUGGING IN THE VALUES GIVES $PV \approx \$30,745.88$.

IF THE FIRST PAYMENT OF \$4,000 IS TO BE RECEIVED IMMEDIATELY, HOW DOES THAT AFFECT THE VALUATION OF THE ANNUITY?

SINCE THE FIRST PAYMENT IS RECEIVED IMMEDIATELY (AN ANNUITY DUE), THE PRESENT VALUE IS HIGHER THAN AN ORDINARY ANNUITY. IT IS CALCULATED AS $PV = P + (P [(1 - (1 + r)^{-(n-1)}) / r])$, REFLECTING THE IMMEDIATE PAYMENT.

WHAT ARE THE TAX IMPLICATIONS FOR AN INVESTOR RECEIVING A \$4,000 ANNUAL ANNUITY FOR TEN YEARS?

TAX IMPLICATIONS DEPEND ON THE INVESTOR'S JURISDICTION AND THE SOURCE OF THE ANNUITY. GENERALLY, EACH PAYMENT MAY BE TAXABLE AS ORDINARY INCOME, BUT SPECIFIC RULES VARY, SO CONSULTING A TAX PROFESSIONAL IS RECOMMENDED.

How do inflation rates affect the real value of the \$4,000 annual payments over ten years?

Inflation reduces the purchasing power of fixed payments over time. If inflation exceeds the rate of return, the real value of each \$4,000 payment decreases, potentially diminishing the annuity's value in real terms.

What are the advantages of receiving an annuity of \$4,000 annually for ten years for retirement planning?

This annuity provides a steady income stream, helps manage cash flow, reduces investment risk, and offers predictability for budgeting during retirement years.

Additional Resources

An investor will receive an annuity of \$4,000 a year for ten years. The first payment is to be received

In the world of investments, annuities stand out as a popular vehicle for securing steady income streams, especially for retirees or individuals seeking financial stability. Imagine an investor who is set to receive an annuity of \$4,000 annually over a period of ten years, with the first payment scheduled immediately. While this scenario might seem straightforward at first glance, it opens up a range of financial considerations, valuation techniques, and strategic implications. This article delves into the intricacies of such an annuity, exploring its structure, valuation, the concept of present value, and how investors and financial planners interpret and utilize these instruments.

Understanding Annuities: Definition and Basic Concepts

What Is an Annuity?

An annuity is a financial product that provides a series of payments made at equal intervals. Typically used for retirement planning, an annuity can be structured in various ways, but fundamentally, it guarantees a stream of income for a specified period or for life.

Types of Annuities

Annuities can be classified broadly into:

- Immediate vs. Deferred Annuities:
 - Immediate annuities begin payments almost immediately after a lump sum is paid.
 - Deferred annuities start payments after a predetermined period.
- Fixed vs. Variable Annuities:
 - Fixed annuities guarantee a fixed payment amount.
 - Variable annuities have payments that vary based on the performance of investments.

Given the scenario of receiving \$4,000 annually for ten years, we're primarily discussing a fixed immediate annuity.

The Specifics of the Scenario: Immediate Fixed Annuity for Ten Years

Payment Structure and Timing

The scenario specifies:

- AN ANNUAL PAYMENT OF \$4,000.
- DURATION: TEN YEARS.
- FIRST PAYMENT TO BE RECEIVED IMMEDIATELY, MEANING THE INVESTOR RECEIVES THE FIRST \$4,000 PAYMENT AT THE OUTSET OF THE CONTRACT, NOT AFTER ONE YEAR.

THIS STRUCTURE IS CLASSIFIED AS AN ANNUITY DUE, WHERE PAYMENTS ARE MADE AT THE BEGINNING OF EACH PERIOD.

IMPLICATIONS OF IMMEDIATE PAYMENTS (ANNUITY DUE)

THE TIMING OF PAYMENTS INFLUENCES THE VALUATION AND PRESENT VALUE CALCULATIONS:

- ANNUITY DUE HAS A HIGHER PRESENT VALUE COMPARED TO AN ORDINARY ANNUITY (WHERE PAYMENTS BEGIN AT THE END OF THE PERIOD) BECAUSE EACH PAYMENT IS RECEIVED EARLIER.
- THE VALUATION MUST ACCOUNT FOR THIS DIFFERENCE, OFTEN BY ADJUSTING THE PRESENT VALUE FORMULA ACCORDINGLY.

VALUING THE ANNUITY: PRESENT VALUE CALCULATIONS

WHY VALUATION MATTERS

UNDERSTANDING THE PRESENT VALUE (PV) OF AN ANNUITY IS VITAL FOR BOTH THE INVESTOR AND THE ISSUER. IT ANSWERS QUESTIONS LIKE:

- HOW MUCH IS THE SERIES OF FUTURE PAYMENTS WORTH TODAY?
- WHAT IS THE FAIR PRICE OF SUCH AN ANNUITY?
- HOW DO INTEREST RATES AFFECT THE VALUATION?

THE PRESENT VALUE OF AN ANNUITY DUE: THE FORMULA

THE FUNDAMENTAL FORMULA FOR THE PRESENT VALUE (PV) OF AN ANNUITY DUE IS:

$$PV = P \times \left(\frac{1 - (1 + r)^{-n}}{r} \right) \times (1 + r)$$

WHERE:

- P = PAYMENT AMOUNT PER PERIOD (\$4,000)
- r = PERIODIC INTEREST RATE (EXPRESSED AS A DECIMAL)
- n = TOTAL NUMBER OF PAYMENTS (10)

THE MULTIPLICATION BY $(1 + r)$ ACCOUNTS FOR THE FACT THAT PAYMENTS ARE MADE AT THE BEGINNING OF EACH PERIOD.

ASSUMPTIONS IN CALCULATION

- INTEREST RATE: FOR ILLUSTRATION, SUPPOSE THE ANNUAL DISCOUNT RATE IS 5%. VARIATIONS IN THIS RATE SIGNIFICANTLY INFLUENCE THE PRESENT VALUE.
- PAYMENT FREQUENCY: PAYMENTS ARE ANNUAL, MATCHING THE RATE PERIOD.
- PAYMENT TIMING: PAYMENTS OCCUR AT THE START OF EACH PERIOD, MAKING IT AN ANNUITY DUE.

EXAMPLE CALCULATION

USING THE VALUES:

- $P = \$4,000$
- $r = 0.05$
- $n = 10$

FIRST, COMPUTE THE PRESENT VALUE OF AN ORDINARY ANNUITY:

$$[PV_{\text{ORDINARY}} = 4000 \times \left(\frac{1 - (1 + 0.05)^{-10}}{0.05} \right)]$$

$$[PV_{\text{ORDINARY}} = 4000 \times \left(\frac{1 - (1.05)^{-10}}{0.05} \right)]$$

CALCULATING:

- $(1.05)^{-10} \approx 0.61391$
- $1 - 0.61391 = 0.38609$
- $0.38609 / 0.05 = 7.7218$
- $PV_{\text{ORDINARY}} \approx 4000 \times 7.7218 \approx \$30,887.20$

SINCE THIS IS AN ANNUITY DUE, MULTIPLY BY $(1 + r) = 1.05$:

$$[PV_{\text{DUE}} \approx 30,887.20 \times 1.05 \approx \$32,431.56]$$

INTERPRETATION:

THE PRESENT VALUE OF THIS TEN-YEAR, \$4,000 ANNUAL ANNUITY DUE AT A 5% DISCOUNT RATE IS APPROXIMATELY \$32,432.

FACTORS AFFECTING ANNUITY VALUATION

INTEREST RATE FLUCTUATIONS

INTEREST RATES ARE THE MOST SIGNIFICANT FACTOR INFLUENCING THE PRESENT VALUE:

- HIGHER RATES: LOWER PRESENT VALUE BECAUSE FUTURE PAYMENTS ARE DISCOUNTED MORE HEAVILY.
- LOWER RATES: HIGHER PRESENT VALUE, REFLECTING LESS DISCOUNTING.

INFLATION CONSIDERATIONS

WHILE THE SCENARIO ASSUMES FIXED PAYMENTS, REAL-WORLD APPLICATIONS OFTEN INVOLVE INFLATION ADJUSTMENTS:

- INFLATION-LINKED ANNUITIES: PAYMENTS INCREASE OVER TIME TO MAINTAIN PURCHASING POWER.
- IMPACT: THIS COMPLICATES VALUATION, REQUIRING MODELS THAT INCORPORATE EXPECTED INFLATION RATES.

TAX IMPLICATIONS

TAXATION CAN AFFECT THE NET BENEFIT TO THE INVESTOR:

- TAX-DEFERRED GROWTH: SOME ANNUITIES ALLOW TAXES TO BE DEFERRED UNTIL WITHDRAWAL.
- TAXABLE PAYMENTS: IN SOME JURISDICTIONS, PAYMENTS MAY BE TAXED, REDUCING NET INCOME.

STRATEGIC IMPLICATIONS FOR INVESTORS

SUITABILITY OF FIXED ANNUITIES

FIXED ANNUITIES LIKE THE SCENARIO IN QUESTION ARE SUITABLE FOR:

- RETIREES SEEKING PREDICTABLE INCOME.
- INDIVIDUALS WITH LOW RISK TOLERANCE.
- THOSE WHO DESIRE SIMPLICITY IN INCOME PLANNING.

HOWEVER, INVESTORS MUST CONSIDER:

- INTEREST RATE ENVIRONMENT.

- INFLATION RISK.
- LIQUIDITY NEEDS: ANNUITIES OFTEN LACK FLEXIBILITY TO ACCESS FUNDS BEFORE THE TERM CONCLUDES.

COMPARING ANNUITY OPTIONS

INVESTORS MAY ALSO EVALUATE:

- DEFERRED VS. IMMEDIATE ANNUITIES.
- FIXED VS. VARIABLE ANNUITIES.
- LIFETIME VS. FIXED-TERM ANNUITIES.

IN THIS CASE, AN IMMEDIATE, FIXED-TERM ANNUITY OFFERS CERTAINTY OVER THE TEN-YEAR PERIOD.

BROADER FINANCIAL PLANNING CONTEXT

ROLE IN RETIREMENT PLANNING

ANNUITIES SERVE AS A CORE COMPONENT OF DIVERSIFICATION IN RETIREMENT PORTFOLIOS, PROVIDING:

- GUARANTEED INCOME STREAMS.
- PROTECTION AGAINST LONGEVITY RISK (OUTLIVING SAVINGS).
- COMPLEMENTARITY WITH OTHER INVESTMENTS.

PRICING AND MARKET CONSIDERATIONS

FINANCIAL INSTITUTIONS PRICE ANNUITIES BASED ON:

- INTEREST RATE FORECASTS.
- LONGEVITY ASSUMPTIONS.
- OPERATIONAL COSTS.

MARKET COMPETITION AND REGULATORY FRAMEWORKS ALSO INFLUENCE PRICING STRUCTURES.

RISKS AND CHALLENGES

MARKET AND ECONOMIC RISKS

- INTEREST RATE FLUCTUATIONS CAN AFFECT THE VALUATION AND PRICING OF NEW ANNUITIES.
- INFLATION RISK ERODES PURCHASING POWER UNLESS PAYMENTS ARE INFLATION-ADJUSTED.

LONGEVITY AND POLICY RISKS

- WHILE THE SCENARIO IS FOR A FIXED PERIOD, IN LIFE ANNUITIES, LONGEVITY RISK IS PROMINENT.
- CHANGES IN REGULATORY POLICIES MAY IMPACT THE PAYOUT STRUCTURES OR TAXATION.

CONCLUSION: KEY TAKEAWAYS

AN INVESTOR RECEIVING A \$4,000 ANNUAL ANNUITY FOR TEN YEARS STARTING IMMEDIATELY IS ENGAGING IN A STRAIGHTFORWARD BUT STRATEGICALLY SIGNIFICANT FINANCIAL ARRANGEMENT. UNDERSTANDING THE VALUATION, TIMING, AND INTEREST RATE SENSITIVITIES OF SUCH ANNUITIES HELPS INVESTORS MAKE INFORMED DECISIONS ALIGNED WITH THEIR FINANCIAL GOALS.

THE PRIMARY CONSIDERATIONS INCLUDE:

- RECOGNIZING THAT THE TIMING OF PAYMENTS (ANNUITY DUE) INCREASES PRESENT VALUE.
- APPRECIATING HOW INTEREST RATES INFLUENCE VALUATION.
- WEIGHING THE BENEFITS OF PREDICTABLE INCOME AGAINST INFLATION AND LIQUIDITY RISKS.
- INTEGRATING SUCH ANNUITIES INTO A COMPREHENSIVE RETIREMENT PLAN.

IN SUMMARY, FIXED IMMEDIATE ANNUITIES PROVIDE A RELIABLE INCOME STREAM, BUT THEIR VALUATION AND UTILITY DEPEND ON BROADER ECONOMIC FACTORS AND INDIVIDUAL CIRCUMSTANCES. CONSCIOUS PLANNING AND UNDERSTANDING OF THE UNDERLYING PRINCIPLES EMPOWER INVESTORS TO HARNESS THESE INSTRUMENTS EFFECTIVELY, ENSURING FINANCIAL STABILITY AND PEACE OF MIND THROUGHOUT THEIR RETIREMENT YEARS.

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