Integrated Financial Planning: Time Value of Money

1. 1 Child Education Planning,
2. Retirement Planning (Importance of I/Y),
3. 2 Child Education Planning,
4. 1 Child Care Planning,
5. 2 Child Care Planning.

Integrated Financial Planning: Time Value of Money

2. Retirement Planning (Importance I/Y),

Time Value of Money: Retirement Planning 1 of 5

Present Value Annuity Due (PVAD) of a Serial Payment

Assume John wants to retire 18 years from now with the inflation-adjusted equivalent of $45,000 additional annual income (above benefits provided by a government or employer pension). Payments at the beginning of each year.

As John and the financial professional discuss his retirement, the two agree to plan for 20 years of inflation-adjusted income in retirement.

Annual inflation is stable at 2.5 percent, and John's portfolio is earning six percent annualized after fees.

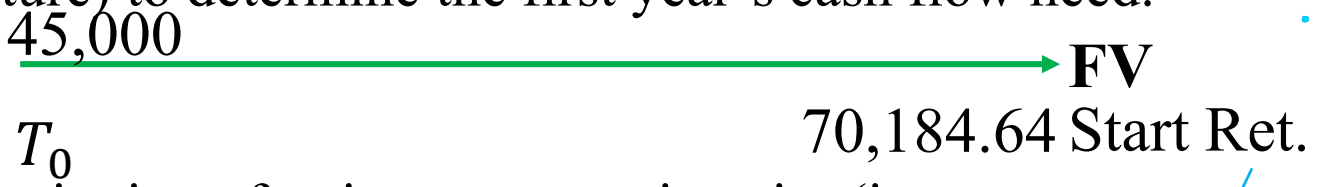
How much money will John need today if he wants the entire amount in place at the beginning of his retirement?

How much money will John need to save every year or month starting today if he wants the entire amount in place at the beginning of his retirement?

Time Value of Money

- The 3 steps for the calculations for retirement planning and education planning are the same:

1. Step #1 Inflate the current cash flow amount or expense for the number of years until required (start of retirement or university i.e. in the future) to determine the first year's cash flow need. **This step uses the rate of inflation only.**



2. Step 2. Calculate the amount needed at the beginning of retirement or university (i.e., not today) to fund the inflation-adjusted cash flow required for the client to maintain purchasing power throughout the anticipated retirement period. **This step uses the real (i.e., inflation-adjusted) rate of return,** and is almost always calculated as an annuity due (i.e. in BGN mode).

3. Step 3. The third step can either solve for a lump sum amount or annual payments needed today to accumulate the retirement fund. **As this step only involves the investment return, we will use the investment, or discount rate**.

Time Value of Money: Retirement Planning 2 of 5

Present Value Annuity Due (PVAD) of a Serial Payment

Assume John wants to retire 18 years from now with the inflation-adjusted equivalent of $45,000 additional annual income (above benefits provided by a government or employer pension). Annual inflation is stable at 2.5 percent.

Step 1: What is $45,000 in today's dollars worth 18 years from now?

Mode = End

P/Y = 1

1.N= 18

2.I/Y = 2.5 We use the Inflation Rate

3.PV = -45,000

4.PMT = 0

5.CPT FV = 70,184.64

Time Value of Money

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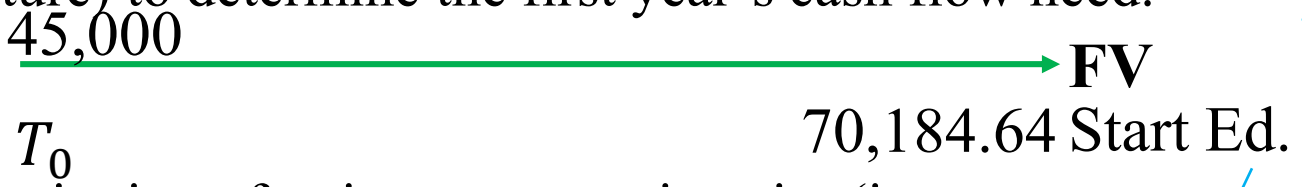

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Time Value of Money: Retirement 3 of 5

Present Value Annuity Due (PVAD) of a Serial Payment

To maintain purchasing power, the negative impact of inflation must be addressed.

Step 2: Determine the amount needed to fund the next 20 years of John's inflation-adjusted retirement income payments.

Mode = **BGN**

P/Y = 1

1. N= 20

2. I/Y = 3.4146 We use the Real Rate

3. PMT = 70,185 (rounded)

4. FV = 0

5. CPT PV = -1,039,567 (rounded)

$$R_r = \left| \frac{1 + R_n}{1 + i} - 1 \right| \times 100$$

$$\left| \frac{1.06}{1.025} - 1 \right| \times 100 = 3.4146$$

Time Value of Money

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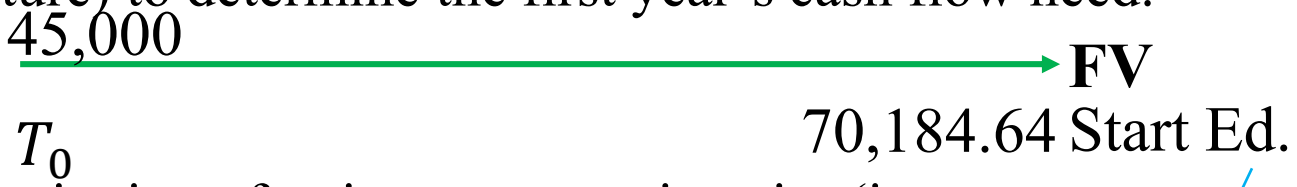

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Time Value of Money: Retirement 4 of 5

Present Value Annuity Due (PVAD) of a Serial Payment

Assume John wants to retire 18 years from now with the inflation-adjusted equivalent of $45,000 additional annual income (above benefits provided by a government or employer pension). Annual inflation is stable at 2.5 percent. portfolio is earning six percent annualized net of fees. Plan for 20 years of inflation-adjusted income in retirement.

Step 3: Determine the amount needed today to meet the goal 18 years from now or determine the amount of monthly or yearly savings.

Mode = **END**

P/Y = 1

1.N= 18

2.I/Y = 6 We use the Investment Rate

3.PMT = 0

4.FV = 1,039,567

5.CPT PV = - 364,205.77

Time Value of Money: Retirement 5 of 5

Present Value Annuity Due (PVAD) of a Serial Payment

Assume John wants to retire 18 years from now with the inflation-adjusted equivalent of $45,000 additional annual income (above benefits provided by a government or employer pension). Annual inflation is stable at 2.5 percent. portfolio is earning six percent annualized net of fees. Plan for 20 years of inflation-adjusted income in retirement.

Step 3: Determine the amount needed today to meet the goal 18 years from now or determine the amount of yearly or monthly savings.

Mode = **END**
P/Y = 1
1.N= 18
2.I/Y = 6 We use the Investment Rate
3.PV = 0
4.FV = 1,039,567
5.CPT PMT = - 33,637

Mode = **END**
P/Y = 12
1. N= 18 x 12 = 216
2. **I/Y = 6 We use the Investment Rate**
3. PV = 0
4. FV = 1,039,567
5. **CPT PMT = - 2,683.77**

Time Value of Money

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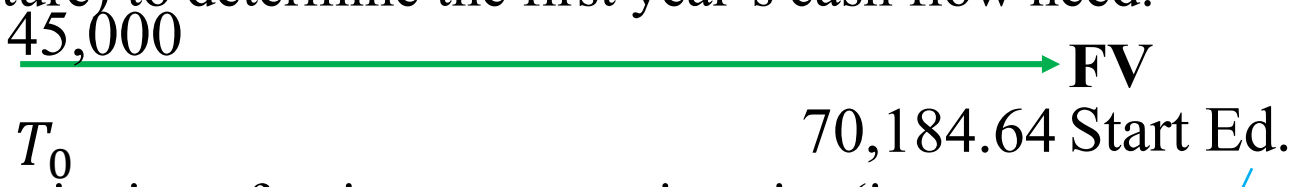

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