Slide 9:

1. If you need $6,000 5 years from now, how much of a deposit must you make in your savings account first year, assuming an 8 percent annual interest rate?

$FV_5 = 6,000 = Deposit \times FVIF_{8\%,5}$

$\therefore Deposit = 6,000 / 1.469 = 4,084.41$ #

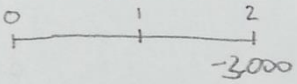
2. You estimate an ancient wood-horse will be worth $2,000,000 when you retire at the end of twenty years. If you expect a 12% return on your investment, how much will you pay for it?

You pay = $PV = 2,000,000 \times PVIF_{12\%,20}$

$= 2,000,000 \times 0.104$

$\therefore = 208,000$ #

3. You just bought a new computer for $3,000. The payment terms are 2 years same as cash. If you can earn 8% on your money, how much money should you set aside today in order to make the payment when due in two years?



$FV_2 = 3,000 = Deposit \times FVIF_{8\%,2}$

$\therefore Deposit = 3,000 / 1.166 = 2,572.8988$ #

Slide 10:

3. As part of your financial planning, you wish to purchase a new car exactly 5 years from today. The car you wish to purchase costs $14,000 today, and your research indicates that its price will increase by 2% to 4% over the next 5 years due to inflation.

a. Estimate the price of the car at the end of 5 years if inflation is (1) 2% per year, and (2) 4% per year.

(1) inflation 2% $\Rightarrow$ $14,000 \times FVIF_{2\%,5} = 14,000 \times (1.104) = 15,456$

(2) inflation 4% $\Rightarrow$ $14,000 \times FVIF_{4\%,5} = 14,000 \times (1.217) = 17,038$ #

b. How much more expensive will the car be if the rate of inflation is 4% rather than 2%?

more = 17,038 − 15,456

= 1,582 #

c. If return from saving in bank is 8%, how much should you save money to get a new car at the end of 5th year if inflation is (1) 2% per year, and (2) 4% per year? Assume single deposit

(1) 2% $\Rightarrow$ $FV_5 = 15,456 = Deposit \times FVIF_{8\%,5}$

$\therefore$ deposit = 15,456 / 1.469 = 10,521.44

(2) 4% $\Rightarrow$ deposit = 17,038 / 1.469 = 11,598.3662 #

Slide 11:

1. Ron Jaffe has been given an opportunity to receive $20,000 (6 years from now). If he can earn 10 percent on his investments, what is the most he should pay for this opportunity?

He pays $PV = 20{,}000 \times PVIF_{10\%,6} = 20{,}000\,(0.564)$

$= 11{,}280$ #

Slide 12:

2. You just won a lottery that promises to pay you $1,000,000 exactly 10 years from today. Because that $1,000,000 payment is guaranteed by the government in which you live, opportunities exist to sell claim today for an immediate single cash payment.

a. What is the least you will sell your claim for if you can earn the following rates of return on similar-risk investments during the 10-year period? (1) 6%, (2) 9%, and (3) 12%.

(1) 6% ⇒ $1{,}000{,}000 \times (0.558) = 558{,}000$

(2) 9% ⇒ 422,000 (3) 12% ⇒ 322,000 #

b. Rework part (a) under the assumption that the $1,000,000 payment will be received in 15 rather than 10 years.

(1) 6% ⇒ $1{,}000{,}000 \times (0.417) = 417{,}000$

(2) 9% ⇒ 275,000 (3) 183,000 #

c. From the finding in parts (a) and (b), discuss the effect of both size of rate of return and the time until receipt of payment on the present value of the future sum.

Slide 17:

1. What is the future value of $20,000 paid at the end of each of the following 5 years, assuming your investment returns 8% per year?

$FV_5 = 20{,}000 \times FVIFA_{8\%,5} = 20{,}000 \times 5.867$

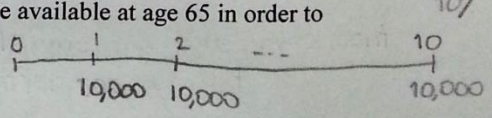
$= 117{,}340$ #

2. Your favorite uncle has offered you the choice of the following options. He will give you either $2,000 1 year from now or $3,000 4 years from now. Which would you choose if the discount rate is (a) 10 percent? (b) 20 percent?

(a) 10% ① $PV = 2{,}000 \times PVIF_{10\%,1} = 1{,}818$ ⑥ $PV_{2000} = 1{,}666$

② $PV = 3{,}000 \times PVIF_{10\%,4} = 2{,}049$ $PV_{3000} = 1{,}446$

3. A 55-year-old executive will retire at age 65 and expects to live to age 75. Assuming a 10 percent rate of return, calculate the amount he must have available at age 65 in order to receive $10,000 annually from retirement until death.



Total money he must have at age 65

$= PV$

$= 10{,}000 \times PVIFA_{10\%,10} = 10{,}000 \times (6.145)$

$= 61{,}450$ #

Slide 19:

Answer the questions that follow:

Case	Amount of Annuity	Interest	Period (Years)
A	2,500	8%	10
B	500	12%	6
C	30,000	20%	5
D	11,500	9%	8
E	6,000	14%	30

a. Assume you deposit the amount of annuity, calculate the future value when it is (1) an ordinary annuity, and (2) an annuity due.

b. Assume you have the annuity return from investment, calculate the present value when it is (1) an ordinary annuity, and (2) an annuity due.

c. Compare the finding in parts a.1 vs. a.2, and b.1 vs. b.2. All else being identical, which type of annuity – ordinary or annuity due – is preferable? Why?

a.

CASE (FV)	(1) ordinary	(2) annuity due = ordinary × (1+r)
A	36,217.5	39,114.9
B	4,057.5	4,544.4
C	223,260	267,912
D	126,822	138,235.98
E	2,140,740	2,782,962

#

b.

CASE (PV)	(1) ordinary	(2) annuity due = ordinary × (1+r)
A	16,775	18,117
B	2,055.5	2,302.16
C	89,730	107,676
D	63,652.5	69,381.225
E	42,018	47,900.52

#

Slide 22:

1. What is the present value of a perpetuity of $80 per year if the discount rate is 11 percent?

$PV = \frac{80}{11\%} = 80/0.11 = 727.2727$ #

2. You want to invest in long-lived company with perpetuity dividend and risk (as presented by different values of discount rates) as below table. Which company would bring you highest present value?

Company	Annual amount	Interest	PV of perpetuity di
A	20,000	8%	250,000
B	100,000	10%	1,000,000
C	3,000	6%	50,000
D	60,000	5%	1,200,000

Company D brings out highest present value. #

Slide 25:

1. Candy Parker has been offered an opportunity to receive the following mixed stream of revenue over the next 3 years. What is present value of this opportunity given interest rate at 15%?

Year	Annual amount	each PV
1	1,000	869.5652
2	2,000	1,512.2873
3	500	328.7581

∴ PV of this opportunity = 2,710.6106 #

Slide 26:

2. As a financial consultant for ABCompany, which project results in the most profitable (Hint: by calculating present value of the streams of cash flows). Assume that the firm's opportunity cost is 12%.

A		B		C	
Year	**Cash Flows**	**Year**	**Cash Flows**	**Year**	**Cash Flows**
1	-2000	1	10000	1-5	10000/year
2	3000	2-5	5000/year	6-10	8000/year
3	4000	6	7000		
4	6000				
5	8000				

Project A : PV of cash flow each year

Year	PV
1	-1785.71
2	2,391.58
3	2,847.12
4	3,813.11
5	4,539.41

∴ Total PV of project A = 11,805.51

Project B

$PV_1 = 10{,}000/(1.12) = 8928.5714$

$PV_{2-5} = 5{,}000 \cdot PVIFA_{12\%,5} - 5{,}000 \cdot PVIF_{12\%,1}$

$= 13{,}560$

$PV_6 = 7{,}000/(1.12)^6 = 3546.4178$

Total PV of proged B

$= 26{,}034.9892$

Project C

$PV_{1-5} = 10{,}000\ PVIFA_{12\%,5}$

$= 36{,}050$

$PV_{6-10} = 8{,}000 \cdot PVIFA_{12\%,10} - 8{,}000 \cdot PVIFA_{12\%,5}$

$= 16{,}360$

∴ Total PV of project C

$= 52{,}410$

Therefore, Project C is the most profitable #