

1. Tanker Transport has current annual fuel costs of \$100,000. What is your estimate of the company's fuel costs 10 years from now if fuel costs are expected to increase at an annual rate of 8%?

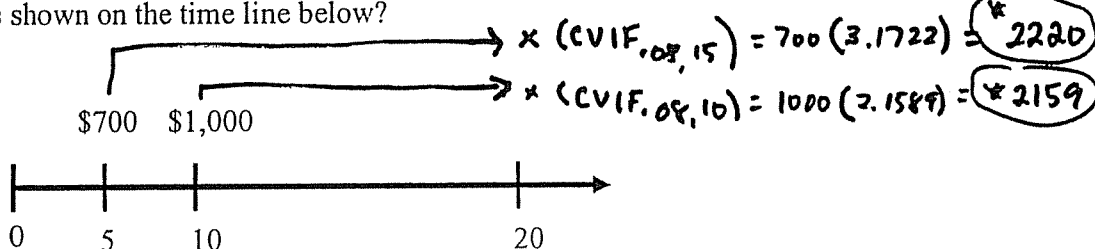
$$FV = PV (CVIF_{.08,10}) = 100,000 (2.1589) = \text{\$} 215,890$$

2. If  $r = 10\%$ , which should you prefer: \$10,000 to be received in 5 years would be preferred over \$16,000 to be received in 10 years?

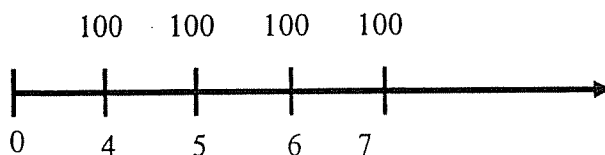
Choose one w/ highest PV:  $10,000 (PVIF_{.10,5}) = 10,000 (.6209) = 6,209$  <sup>\* pri</sup>

$$16,000 (PVIF_{.10,10}) = 16,000 (.3855) = 6,168$$

3. What is the future value in 20 years from the present (assume  $r = 8\%$ ) of each of the two dollar amounts shown on the time line below?



4. If  $r = 6\%$ , what is the present value of the income stream shown below (calculate using the present value of annuity factors).



$$PV = 100 (PVIFA_{.06,7}) - 100 (PVIFA_{.06,4})$$

$$= 100 (5.5824) - 100 (2.6730)$$

$$= 558.24 - 267.30$$

$$PV = 290.94$$

5. If you borrow \$1,000 today at 11%, how many years from now would you have to pay off the loan with a \$1,685 principal and interest payment?

$$PV = \frac{FV}{(1+r)^n} = FV (PVIF_{r,n}) \Rightarrow 1000 = 1685 (PVIF_{.11,n})$$

$$\Rightarrow PVIF_{.11,n} = 1000/1685 = .5934$$

$$\Rightarrow n \approx 5$$

6. Jane's salary today is \$58,771. Five years ago it was \$40,000. What has been the compound annual rate of her salary increases over this time?

$$FV = PV (CVIF_{r,n}) \Rightarrow 58,771 = 40,000 (CVIF_{r,5})$$

$$\Rightarrow CVIF_{r,5} = \frac{58,771}{40,000} = 1.4693$$

$$\Rightarrow r \approx 8\%$$

Wed

7. Cy has decided he/she would like to invest annually into a savings account in order to have \$200,000 additional retirement money in 40 years. Cy is considering two options: A = invest an equal annual amount ( $= X_A$ ) for 40 years starting 1 year from now or B = invest an equal annual amount ( $= X_B$ ) for 25 years starting 15 years from now. What are the values of  $X_A$  and  $X_B$  if  $r = 7\%$ ?

see attached (below)

8. Assume U.R., a co-op employee, needs a pickup truck over the next 5 years in order to do the job that he has been hired to do by the co-op. Fortunately for U.R., the co-op has agreed to provide him with a truck. The co-op is considering two alternative truck purchase options – buy a new truck or buy a used truck. The co-op manager has developed the (assume after-tax) annual end-of-year figures below for the two options.

Year	Item	New Truck	Used Truck
0	Initial purchase expense	\$20,000	\$10,000
1	Annual expenses	\$2,000	4,000
2	Annual expenses	\$2,000	4,000
3	Annual expenses	\$2,000	4,000
4	Annual expenses	\$2,000	4,000
5	Annual expenses	\$2,000	4,000
5	Salvage value	0	0

Explain, using formulas, if  $r = 6\%$ , which truck would you recommend that the co-op purchase?

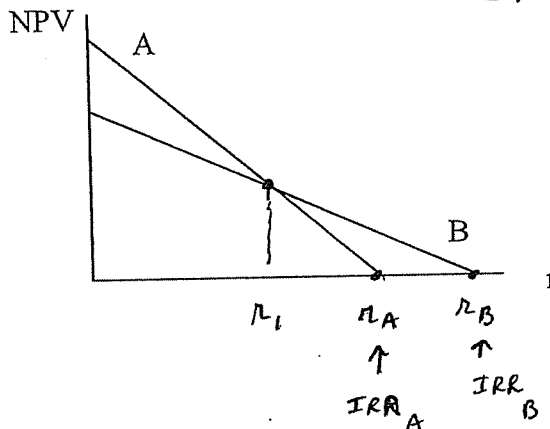
PV of costs: New  $\Rightarrow 30,000 + 1500 (PVIFA_{.06,5}) = 30,000 + 1500 (4.2124) = 36,319^*$  preferred

Used  $\Rightarrow 20,000 + 4000 (PVIFA_{.06,5}) = 20,000 + 4000 (4.2124) = 36,850$

9. Assume Ima Publisher is in charge of pricing 3-year magazine subscriptions for her company. Subscribers are being given two options: 1) one payment to be made now or 2) three equal annual payments of \$30.00 each with the first payment due one year from now. If  $r = 7\%$ , Ima's company should be equally happy with what single payment now?

$\Rightarrow$  Pymt now = PV of annual pymts = 104.97  
 $= 40 (PVIFA_{.07,3}) = 40 (2.6243) \approx \$105$

10. Assume a business firm manager can only choose one of the projects below (A or B). Which do you recommend?



If use NPV method, prefer

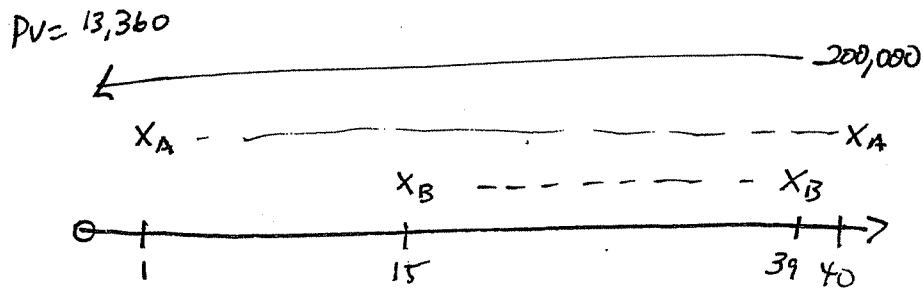
A if  $r < r_i$

B if  $r > r_i$

If use IRR method,

prefer B

#7



= a 40-yr annuity (end of yrs 1-40)

$$X_A \Rightarrow 13,360 = X_A (PVIFA_{.07, 40})$$

$$\Rightarrow X_A = \frac{13,360}{13.3317} \approx \$1002$$

= a 25-yr annuity (end of yrs 15-39)

$$X_B \Rightarrow 13,360 = X_B (PVIFA_{.07, 25}) (PVIF_{.07, 14})$$

$$\Rightarrow 13,360 = X_B (11.6536) (.3878)$$

$$\Rightarrow X_B = \frac{13,360}{4.51926} \approx \$2956$$