FIN5633: Concepts tested on DCF Quiz

- Present Value
- Future Value
- Internal Rate of Return
- Annuities
- Perpetuities, delayed perpetuities, growing perpetuities.
- Skipping annuities and perpetuities (payment is not made each period, but “skips”)
- Annualized Rate of Return (APR, EAR)

Examples

1. (Easy) You deposit $1,000 in a bank that pays 5%. Your balance be after 9 years will be:
   A) 1,450.00
   B) 1,504.78
   C) 1,551.33
   D) not enough information to determine.
   E) none of the above.

2. (Medium). A security posts the following rates of return: 8%, 20%, -16%. What rate of return would be required on a security that pays a constant interest rate, so that you would have the same total return over 3 periods?
   A) 2.87
   B) 4.00
   C) 5.23
   D) not enough information to determine.
   E) none of the above.

3. (Hard) The double up security, is a perpetual security that pays double every fifth year. It’s typical annual payment of $250, is doubled at year 5, 10, 15… As a bonus, it makes an immediate double up payment of $500. For an 8% discount rate, what should you pay for this security?
   A) 3,798.24
   B) 4,157.68
   C) 4,673.69
   D) not enough information to determine.
   E) none of the above.
FIN5633: Discounted Cash Flow Quiz

1. You deposit $100 in a bank account that pays 6% per year. How much will you have on deposit 12 years from today if you make no additional deposits?
   A) 172.00
   B) 201.22
   C) 205.08
   D) not enough information to determine.
   E) none of the above.

2. One year from today you deposit $100 in a bank account that pays 6% per year. You make annual deposits for 12 years (12 deposits total) What is your bank balance?
   A) 1,686.99
   B) 1,725.12
   C) 1,788.21
   D) not enough information to determine.
   E) none of the above.

3. Instead of waiting one year, you make your first of 12 annual deposits today, how much will have 12 years from now. (Bank pays 6%).
   A) 1,686.99
   B) 1,725.12
   C) 1,788.21
   D) not enough information to determine.
   E) none of the above.

For questions 4-7, you want to withdraw, 7 years from today, $500 from a bank that pays 7% per year

4. What single deposit must you make today?
   A) 311.37
   B) 334.68
   C) 423.12
   D) not enough information to determine.
   E) none of the above.

5. You know that 2 years from now you will be depositing $300. How much additional must you deposit today to achieve your goal?
   A) 19.33
   B) 49.34
   C) 73.94
   D) not enough information to determine.
   E) none of the above.

6. If instead of putting in one lump sum amount today, say you wait 1 year, and then put in an amount X, and then put in X each year until your 7th investment of X, what must X be?
   A) 46.43
   B) 57.78
   C) 72.24
   D) not enough information to determine.
   E) none of the above.
7. If instead of putting in one lump sum amount today, you immediately deposit Y, and each year thereafter deposit an additional Y each year until your 7th investment, what must Y?
   A) 46.43
   B) 54.00
   C) 72.24
   D) not enough information to determine.
   E) none of the above.

8. A bank is paying 1% per month on its deposits. What is the annualized yield (EAR)?
   A) 11.89%
   B) 12.00%
   C) 12.68%
   D) not enough information to determine.
   E) none of the above.

9. For a 7% discount rate, what will you pay for a security that pays $100 per year for the next 9 years, and $1100 on the 10th year?
   A) 1210.71
   B) 1249.85
   C) 1295.49
   D) not enough information to determine.
   E) none of the above.

10. For a $900 you can buy a security which pays $50 per year for the next 14 years and 1050 on its final (the 15th year) payment. What is the IRR of purchasing this security?
    A) 6.03
    B) 6.33
    C) 6.37
    D) not enough information to determine.
    E) none of the above.

11. The friendly financier is having a sale on money. He is selling $100 bills for $95, but you have to wait one year for him to deliver the $100 bill. Your annual rate of return on such an investment (EAR)?
    A) less than 5%
    B) equal to 5%
    C) more than 5%
    D) not enough information to determine.
    E) none of the above.

12. Referring to the previous question. If he delivers the $100 bill in 3 months, what is your annualized rate of return (EAR)?
    A) 20.00
    B) 21.05
    C) 22.77
    D) not enough information to determine.
    E) none of the above.

13. You put $100 in a bank 6 years ago and it is now worth 150. What is your annualized rate of return (EAR)?
    A) 6.38
    B) 6.78
    C) 6.99
    D) not enough information to determine.
    E) none of the above.
14. Referring to the previous question, if the interest rate was constant over the period, and the bank compounds monthly, was rate of annual interest will it post (APR)?
   A) 6.38
   B) 6.78
   C) 6.99
   D) not enough information to determine.
   E) none of the above.

15. You put your money in an account with the following monthly returns. 1%, -1%, 0%, 2%, -2%. How much money will you have at the end of this 5 month period.
   A) less than you deposited
   B) exactly what you deposited
   C) more than you deposited
   D) not enough information to determine.
   E) none of the above.

16. You bought a stock for $100, and sold it after 4 months for $103. It paid no dividends. Ignoring any commissions, what annualized rate of return (EAR) did you earn on this stock.
   A) 9.00
   B) 9.27
   C) 12.00
   D) not enough information to determine.
   E) none of the above.

17. How much money do you have to deposit today in a bank that pays 6% per year, so that you can withdraw $120 per year forever starting 1 year from today?
   A) 1880.00
   B) 2000.00
   C) 2120.00
   D) not enough information to determine.
   E) none of the above.

18. How much money do you have to deposit in a bank that pays 6% per year, so that you can withdraw $120 per year forever starting immediately (i.e., first withdrawal is today)?
   A) 1880.00
   B) 2000.00
   C) 2120.00
   D) not enough information to determine.
   E) none of the above.

19. How much money do you have to deposit in a bank that pays 8% per year (EAR), so that you can withdraw $350 every 4 years forever, your first withdrawal being 4 years from now?
   A) 923.29
   B) 953.69
   C) 970.90
   D) not enough information to determine.
   E) none of the above.
20. What if you want to make your first withdrawal 2 years from now, and then every 4 years forever?
   A) 821.45
   B) 857.98
   C) 1132.46
   D) not enough information to determine.
   E) none of the above.

21. What is the present value of a perpetuity of $100 that has its first payment 4 years from today, assuming a 9% discount rate?
   A) 857.98
   B) 1049.39
   C) 1111.11
   D) not enough information to determine.
   E) none of the above.

22. You are promised the following cash flows. $200 today, $100 one year from today, $200 two years from today, $100 three years from today, $200 four years from today, $100 five years from today and so on forever. What is the present value of these cash flows for a 12% discount rate?
   A) 1226.41
   B) 1326.41
   C) 1426.41
   D) not enough information to determine.
   E) none of the above.

23. As above, but suppose the cash flows stop after the 21st payment?
   A) 1031.54
   B) 1199.28
   C) 1299.28
   D) not enough information to determine.
   E) none of the above.

24. New securities has issued a security which pays $100 in years 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, and so on, repeating this pattern of making 4 annual payments and then missing one. For a discount rate of 10%, what is the value of this security?
   A) 836.20
   B) 912.47
   C) 1000.00
   D) not enough information to determine.
   E) none of the above.

25. You are thinking about purchasing a security that just paid a $2 dividend. If dividends are growing at 5% per year, and the appropriate discount rate for this security is 11%, what should it sell for?
   A) 31.11
   B) 33.33
   C) 35.00
   D) not enough information to determine.
   E) none of the above.
DCF Quiz Solutions  Unless stated, P/YR=1

1. FV(PV=–100, I/YR=6, N=12) =

2. FV(PMT=–100, N=12, I/YR=6) =

3. Toggle BEG/END, then press PV =  (Remember to untoggle BEG/END)

4. PV(FV=500, N=7, I/YR=7) =

5. First FV(PV=–300, N=5, I/YR=7) = , then  PV(FV = 79.23 N=7, I/YR=7) =

6. PMT(FV=500, N=7, I/YR=7) =

7. Toggle BEG/END, then press PMT =  (Remember to untoggle BEG/END)

8. \((1.01)^{12} - 1 =\)

9. PV(PMT=100, FV=1000, I/YR=7, N=10) =

10. I/YR(PV=–900, FV=1000, PMT=50, N=15) =

11. hpr = \((100 – 95)/95 =\)

12. \(hpr = (100 – 95)/95 =\quad \text{EAR} = (1+hpr)^4 - 1 =\)

13. I/YR(FV=150, PV=–100, N=6) =

14. Solve for monthly rate: I/YR(FV=150, PV=–100, N=72) = ; multiply by 12 =

15. less (arithmetic mean is zero, geometric mean is negative)

16. \(hpr = (103–100)/100 = 0.03, \quad \text{EAR} = (1+.03)^3 - 1 =\)

17. PV = \(120/0.06 =\)

18. $120 more than above, to allow for immediate withdrawal

19. 4 year interest rate = \((1.08)^4 – 1 = . \quad PV = $350/((1.08)^4 – 1) =\)

20. \((350 + above)/(1.08)^2 \quad \text{or, above answer} \times (1.08)^2\)

21. \((100/0.09)/(1.09)^3 =\)

22. \(200 + 100/0.12 + 100/((1.12)^2 – 1) =\)

23. Can set up a two annuities, one with 20 pmt, the other with 10 (use a 2 year discount rate = \((1.12)^2 – 1 \), plus add the $200 for the immediate payment.

\[200 + PV(PMT=100, I/YR=12, N=20) + PV(PMT=100, I/YR=25.44, N=10) =\]

24. Value of perpetuity minus value of skipping perpetuity

\[= 100/0.10 – 100/((1.10)^5 – 1)\]

25. Gordon model: \(PV = (2*1.05)/(0.11 – 0.05) =\)