**Question 1:** Schwert Corporation shows the following information on its 2019 income statement: sales=$256,000; costs=$145,000; other expenses=$8,100; depreciation expense=$20,100; interest expense=$11,000; taxes=$19,500; dividends=$8,800. In addition, you’re told that the firm issued $8,900 in new equity during 2019 and redeemed $7,800 in outstanding long-term debt.

1. What is the 2019 operating cash flow?
2. What is the 2019 cash flow to creditors?
3. What is the 2019 cash flow to stockholders?
4. What is the 2019 cash flow from assets?

**Solution 1:**

|  |  |
| --- | --- |
| ***Input area:*** |  |
|  |   |
| Sales |  $ 256.000  |
| Costs |  $ 145.000  |
| Other expenses |  $ 8.100  |
| Depreciation expense |  $ 20.100  |
| Interest expense |  $ 11.000  |
| Taxes |  $ 19.500  |
| Dividends |  $ 8.800  |
|   |   |
| New equity |  $ 8.900  |
| Net new long-term debt |  $ (7.800) |

|  |
| --- |
| ***Output area:*** |
| Income Statement |
| Sales |  $ 256.000 |
| Costs |  145.000 |
| Other expenses |  8.100 |
| Depreciation expense |  20.100 |
| **EBIT** |  **$ 82.800**  |
| Interest expense |  11.000  |
| EBT |  $ 71.800  |
| Taxes | 19.500 |
| Net income |  $ 52.300 |
| Dividends |  $ 8.800 |
| Addition to retained earnings |  $ 43.500  |

1. Operating cash flow = EBIT + Depreciation – Taxes

Operating cash flow = 82.800 + 20.100 – 19.500 = $ 83.400

1. Cash flow to creditors = Interest paid – Net new borrowing

Cash flow to creditors = 11.000 – (– 7.800) = $ 18.800

1. Cash flow to stockholders = Dividends paid – Net new equity

Cash flow to stockholders = 8.800 – 8.900 = -100

1. Cash flow from assets = CF to creditors + CF to stockholders

Cash flow from assets = 18.800 - 100 = $18.700

**Question 2:** What proportion of a firm is equity financed if the WACC is 9.1%, the before-tax cost of debt is 6.4%, the tax rate is 21%, and the required return on equity is 11%?

**Solution 2:** Cost of debt (Kd) =Yield (1 – t)

Required return on equity = 11%

WACC = 9.1%

9.1% = (1 − *x*)(6.4%)(1 – 21%) + *x*(11%)

*x* = 68%

**Question 3:** The Dybvig Corporation’s equity has a beta of 1.3. If the risk-free rate is 4.5 per cent and the expected return on the market is 12 per cent. What is Dybvig’s cost of equity capital?

**Solution 3:** With the information given, we can find the cost of equity using the CAPM. The cost of equity is:

RE = 0.045 + 1.30 (0.12 –0 .045) = 0.1425 or 14.25%

**Question 4:** Compute “the cost of equity” and “the cost of new common stock” under the following circumstances:

Dividend at the beginning of the first period = $6,

Growth rate for dividends and earnings = 7%,

Price of stock today = $60,

Flotation costs = $3.

**Solution 4:**

|  |  |
| --- | --- |
| g | 7% |
| D0 | $6 |
| P0 | $60 |
| F | $3 |

D1 = D0 x (1+g) = 6.00 x (1.07) = $6.42

Ke = (D1 / P0) + g = (6.42 / 60) + 0,07 = 17.7%

Kn = (D1 / (P0−F)) + g = (6.42 / (60−3)) + 0,07 = 18.26%

**Question 5:** Here are the cash-flow forecasts for two mutually exclusive projects:

|  |  |  |
| --- | --- | --- |
| Year | Project A | Project B |
| 0 | −40.000 | −40.000 |
| 1 | 25.000 | 8.000 |
| 2 | 15.000 | 10.000 |
| 3 | 12.000 | 16.000 |
| 4 | 10.000 | 32.000 |

1. Calculate the Net Present Value of the following Project A and B for discount rates of 15%. Which projects should you take?
2. Calculate the Internal Rate of Return for Project A and B.

**Solution 5:**

1. And we assume that the discount rate is 15 %. In this case;

**NPVA**= -40.000 + 25.000/(1 + 15%) 1  + 15.000/(1 + 15%) 2 + 12.000/ (1 + 15%) 3 + 10.000/ (1 + 15%) 4 = **6.689,01**

NPVB= -40.000 + 8.000/(1 + 15%) 1  + 10.000/(1 + 15%) 2 + 16.000/ (1 + 15%) 3 + 32.000/ (1 + 15%) 4 = 3.334,32

1. IRRA:

40.000 = 25.000/(1+ r) 1 + 15.000/ (1+ r) 2 + 12.000/( 1+ r) 3 + 10.000/ (1+ r) 4

When we solve the equation; the IRR will be 25%. (For calculations it can be used the IRR function in Excel)

IRRB:

1. = 8.000/(1+ r) 1 + 10.000/ (1+ r) 2 + 16.000/( 1+ r) 3 + 32.000/ (1+ r) 4

When we solve the equation; the IRR will be 18%. (For calculations it can be used the IRR function in Excel)

**Question 6:** Investments X and Y, suppose that each has a cost of capital of 10%.

|  |  |  |
| --- | --- | --- |
| Year | Investment X | Investment Y |
| 0 | −150.000 | −200.000 |
| 1 | 100.000 | 100.000 |
| 2 | 100.000 | 100.000 |
| 3 | 30.000 | 50.000 |

What is the Modified Internal Rate of Return for each project?

**Solution 6:**

MIRRX : $150000=\frac{100000\left(1.10\right)^{2}+100000\left(1.10\right)^{1}+30000\left(1.10\right)^{0}}{\left(1+r^{\*}\right)^{3}}$

MIRRX : When we solve the equation; the MIRR will be 20%. (For calculations it can be used the MIRR function in Excel)

MIRRY : $200000=\frac{100000\left(1.10\right)^{2}+100000\left(1.10\right)^{1}+50000\left(1.10\right)^{0}}{\left(1+r^{\*}\right)^{3}}$

MIRRY : When we solve the equation; the MIRR will be 12%. (For calculations it can be used the MIRR function in Excel)

**Question 7:** Calculate the Profitability Index for each investment for discount rates of 6%. Which Project shold you take?

|  |  |  |
| --- | --- | --- |
| Year | Investment A | Investment B |
| 0 | −1.000.000 | −2.000.000 |
| 1 | 250.000 | 400.000 |
| 2 | 250.000 | 400.000 |
| 3 | 250.000 | 400.000 |
| 4 | 600.000 | 1.200.000 |

**Solution 7:**

PIA :

=[250.000/(1+0,06)+250.000/(1+0,06)2+250.000/(1+0,06)3+600.000/(1+0,06)4]/1.000.000
**PIA = 1,14**

PIB :

=[400.000/(1+0,06)+400.000/(1+0,06)2+400.000/(1+0,06)3+1.200.000/(1+0,06)4]/2.000.000
PIB = 1,01

**Question 8:** The investment amount is 10.000$ and the economic life is shorter than 1 year. Based on the data in the table, compute the expected value, standard deviation and coefficient and variation.

|  |  |
| --- | --- |
| Cash Flow | Probability |
| 3.000 | 0,10 |
| 4.000 | 0,25 |
| 5.000 | 0,30 |
| 6.000 | 0,25 |
| 7.000 | 0,10 |

**Solution 8:**

Expected value:

|  |  |  |
| --- | --- | --- |
| R | P | R x P |
| 3.000 | 0,10 | 300 |
| 4.000 | 0,25 | 1.000 |
| 5.000 | 0,30 | 1.500 |
| 6.000 | 0,25 | 1.500 |
| 7.000 | 0,10 | 700 |
| $ 5.000 = ∑RP = $\overbar{R}$  |

Standard deviation:



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Step 1Substract the expected value ($\overbar{R}$) from each outcome  | Step 2Square(R−$\overbar{R}$) |  | Step 3Multiply by P and Sum | Step 4Determine Square Root |
| R | $$\overbar{R}$$ | (R−$\overbar{R}$)  | (R−$\overbar{R}$)2 |  | P | (R−$\overbar{R}$)2 P |  |
| 3.000 | 5.000 | -2.000 | 4.000.000 | X | 0,10 | 400.000 |  |
| 4.000 | 5.000 | -1.000 | 1.000.000 | X | 0,25 | 250.000 |  |
| 5.000 | 5.000 | 0 | 0 |  | 0,30 | 0 |  |
| 6.000 | 5.000 | 1.000 | 1.000.000 |  | 0,25 | 250.000 |  |
| 7.000 | 5.000 | 2.000 | 4.000.000 | X | 0,10 | 400.000 | $\sqrt{1.300.000}$ = 1.140 |

Coefficient of variation:

V= 1.140 / 5.000 =22,8%

**Question 9:** Firm X has a tax rate of 26%. The price of its new preferred stock is $70 and its flotation cost is $2.00. The cost of new preferred stock is 12%. What is the firm's dividend?

**Solution 9:** Kp =Dp/(Pp – F)

 0.12 = Dp/(70 – 2.00)

 Dp = 8.16

**Question 10:** Calculate the payback period for each project. Which project has the shortest payback period?

|  |  |  |
| --- | --- | --- |
| Year | Project A | Project B |
| 0 | −12.000 | −10.000 |
| 1 | 4.000 | 6.000 |
| 2 | 3.000 | 3.000 |
| 3 | 4.000 | 3.000 |
| 4 | 2.000 | 1.000 |
| 5 | 1.000 | 3.000 |

**Solution 10:** For Project A:

|  |  |  |
| --- | --- | --- |
| Year | Project A | Accumulated cash flows |
| 1 | 4.000 | 4.000 |
| 2 | 3.000 | 7.000 |
| 3 | 4.000 | 11.000 |
| 4 | 2.000 | 13.000 |
| 5 | 1.000 | 14.000 |

Payback period for A: 3,6

For Project B:

|  |  |  |
| --- | --- | --- |
| Year | Project B | Accumulated cash flows |
| 1 | 6.000 | 6.000 |
| 2 | 3.000 | 9.000 |
| 3 | 3.000 | 12.000 |
| 4 | 1.000 | 13.000 |
| 5 | 3.000 | 16.000 |

Payback period for **B: 2,4**