**ACCOUNTING AND CORPORATE FINANCE**

**Exam February 2nd 2017**

1. Time at disposal: 2 hours.
2. Only students who want the paper corrected (and so the 2 points bonus to be applied) have to send an e-mail to me (elisa.ughetto@polito.it) saying: CORRECT by Sunday 5th February
3. The use of smartphone is not allowed. Students found with a smartphone on the desk will have to leave immediately and will be signalled to the Disciplinary Commission of Politecnico di Torino.

EXERCISE n.1 (**12 points)**

At the end of year 2014 the balance sheet of Yadax Co is the following:

|  |  |
| --- | --- |
| ASSETS |  |
| Cash and Cash Equivalents | 1,550,000 |
| Account Receivables | 477,600 |
| Inventory | 867,000 |
| Pre-paid Expenses | 956,000 |
| Total current assets | 3,850,600 |
|  |  |
| Note Receivables | 87,703 |
| Intangible assets (net of accumulated amortization) | 78,900 |
| Manufacturing Equipment | 120,000 |
| Accumulated depreciation on manufacturing equipment | -57,600 |
| Land | 825,197 |
| Total long-term assets | 1,054,200 |
|  |  |
| Total assets | 4,904,800 |
|  |  |
| LIABILITIES AND STOCKHOLDERS EQUITY |  |
|  |  |
| Note Payable | 124,500 |
| Accrued Income Taxes | 30,200 |
| Accrued Salaries | 100,000 |
| Deferred Income Taxes | 31,900 |
| Other accrued liabilities | 145,000 |
| Total current liabilities | 431,600 |
|  |  |
| Other long-term debt | 924,900 |
| Bond Payable | 383,000 |
| Total long-term debt | 1,307,900 |
|  |  |
| Contributed Capital | 875,600 |
| Retained Earnings | 1,890,700 |
| Accumulated other comprehensive income (loss) | 399,000 |
| Total stockholder's equity | 3,165,300 |
|  |  |
| Total liabilities+ stockholder's equity | 4,904,800 |

The following transactions occurred in 2015:

1. Total gross sales for the period include the following: credit card sales (discount 3%) for a total of 9,400$ and sales on account (2/15, n/60) for a total of 12,000$. Sales returns related to sales on account were 650$. All returns were made before payment. One-half of the remaining sales on account were paid within the discount period. The company treats all discounts and returns as contra-revenues.
2. The company decides to replace furniture that had been used in the business for 5 years. The records of the company reflect the following regarding the sale of the existing furniture: cost of furniture 8,000$, accumulated depreciation 7,700$. The furniture was sold for 900$.
3. In Christmas the company builds up its inventory to meet Christmas demand. A large portion of these Christmas sales are on credit. As a result the company collects money several months after Christmas. Assume that on Nov 1 2015 the company borrowed 480,000$ from Texas Capital bank for working capital purposes and signed an interest bearing note due in 6 months. The interest rate was 8% per annum payable at maturity. In addition, in December a previous bank note of 20,000$ matures and has to be paid on December 31.
4. The company paid salaries for 300,000 $. In addition one employee retired on June 30th 2015 and received a benefit pay of 5,000$, that was already earned in 2014 but not yet paid. During 2015 the benefit pay accumulated by all employees but not yet paid amounted to 20,000$.
5. The company issued 850,000$, 10-year 8% bonds on January 1st 2015.The bonds sold for 910,000$. Interest is payable annually each December 31. The yield on bonds is 7%. Use the effective interest method to record the amortization.
6. The company earned additional sales for 678,000$
7. On December 2015 the company receives 8,000$ rent in advance for January, February and March 2016. This 8,000 will be earned in 2016 for financial accounting purposes but are taxed in 2015. The company is subject to a tax rate of 30%.

Prepare the T-accounts and income statement.

SOLUTIONS

Transaction 1

|  |  |
| --- | --- |
| Credit card sales (R) | $9,400.00 |
| Less: Credit card discount (XR) | 282.00 |
| Net credit card sales | $9,118.00 |
|  |  |
| Sales on account (R) | $12,000.00 |
| Less: Sales returns (XR) | 650.00 |
|  | 11,350.00 |
| Less: Sales discounts (1/2 x $11,350 x 2%) (XR) | 113.50 |
| Net sales on account | 11,236.50 |
| Net sales (reported on income statement) | $20,354.50 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Revenues*** | |  | ***Note Payable*** | |  |
|  | 20,354.50 (1)  678,000 (6) |  | 20,000 (3) | Beg. 124,500  480,000 (3) |  |
|  | 698,354 |  |  | 584,500 |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***Cash*** | |  | ***Accumulated deprec*** | |  | ***Gain on sale*** | |
| Beg. 1,550,000   1. 20,354.5 2. 900 3. 480,000 4. 910,000 5. 8,000 6. 678,000 | 20,000 (3)  5,000 (4)  300,000 (4)  68,000 (5) |  | (2)7,700 |  |  |  | 600 (2) |
|  | 3,254,254.5 |  | 7,700 |  |  |  | 600 |

Transaction 2

Cost –accumulated depreciation= 8,000-7,700=300 (book value)

Gain on sale=900-300=600$

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Equipment*** | |  | ***Interest expense*** | |
| Beg. 120,000 | 8,000 (2) |  | 6,400 (3)  63,700 (5) |  |
|  | 112,000 |  | 70,100 |  |

Transaction 3

480,000\*8%\*2/12=6,400 (rounded)

Transaction 5

PV bond=910,000

January 1, 2015:

|  |  |  |  |
| --- | --- | --- | --- |
| Cash (+A) | 910,000 |  |  |
| Premium on Bonds Payable (+L) |  |  | 60,000 |
| Bonds Payable (+L) |  |  | 850,000 |

December 31, 2015:

|  |  |  |  |
| --- | --- | --- | --- |
| Interest Expense (+E, -SE) ($910,000 × 7%) | 63,700 |  |  |
| Premium on Bonds Payable (-L) | 4,300 |  |  |
| Cash (-A) ($850,000 × 8%) |  |  | 68,000 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Interest Payable*** | |  | ***Accrued salaries*** | |
|  | 6,400 (3) |  | 1. 5000 | 20,000 (4) |
|  | 6,400 |  |  | 15,000 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Wage expense*** | |  | ***Benefit expense*** | |
| (4) 300,000 |  |  | 1. 20,000 |  |
| 300,000 |  |  | 20,000 |  |
| ***Bonds Payable*** | |  | ***Premium on bonds*** | |
|  | 850,000 (5) |  | 1. 4,300 | 60,000 (5) |
|  | 850,000 |  |  | 55,700 |
| ***Unearned rent*** | |  |  | |
|  | 8,000 (6) |  |  |  |
|  | 8,000 |  |  |  |

8,000 recognized as rent expenses in 2016 for financial income but taxed in 2015

Taxable income=pre-tax (308,854.5)+8,000 rent expense=316,854.5

Income tax payable=316,854.5\*0.30=95,056.35

Deferred tax asset=8,000\*0.3=2,400

Income tax expense=95,056.35-2,400=92,656.35

Income statement

|  |  |
| --- | --- |
| **Revenues:**  Sales revenues  **Costs and expenses:**    wage expense  benefit expense    **Other revenues and gains/losses**  Interest expense  Gain on sale  **Pre-tax income**  Income tax expense    **Net Income** | 698,354  (300,000)  (20,000)  (70,100)  600  308,854.5  (92,656.35)  216,198.2 |

EXERCISE n.2  **(13 punti)**

Company PHARMA Spa is a pharmaceutical company and it is not quoted on the financial market. The following analyses are realized at the beginning of 2017, having at disposal the following data relative to the last 2 years of activity of the company (data in Mln Euros).

|  |  |  |
| --- | --- | --- |
|  | Year 2015 | Year 2016 |
| Number of shares (mln) | 15 | 15 |
| revenues | 600 | 620 |
| EBITDA | 90 | 96 |
| Amortization costs | 10 | 10 |
| Common stock | 70 | 70 |
| Stockholders equity | 300 | 180 |
| Account Receivable | 20 | 18 |
| Account Payable | 11 | 14 |
| Work in progress inventory | 25 | 30 |
| Finished products inventory | 41 | 41 |
| Financial debt | 180 | 190 |
| Corporate tax rate | 30% | 30% |

Company PHARMA Spa has financial debts made of bonds and bank debt. The company has issued in the past 125,000 coupon bonds with the following features: Face value 1,000 Euro, maturity 30 June 2018, annual coupon rate 4%. Given the risk level of the issuer, these bonds present a return spread of 3.5% with respect to governmental securities of similar maturities. Bank debt is associated with an annual interest rate equal to 5%. The following data concerning a competitor of PHARMA Spa are available. This competitor is quoted on the financial market, does not have financial debt and has maintained in recent years a pay-out ratio constant (data are in mln Euros).

|  |  |
| --- | --- |
| Competitor | year 2016 |
| Revenues | 800 |
| EBIT | 100 |
| Stockholders equity (book value) | 300 |
| Market capitalization | 400 |
| Last dividend per share | 2.8 |
| Number of shares | 9 |
| Corporate tax rate | 30% |

The following information on the financial markets are available:

Return of the market portfolio: 15%

Spot rate curve for governmental bonds:

St=2,5%+0,7%\*t

Questions:

1. Calculate the rwacc of PHARMA SPA and its target price under the assumption that cash flows generated in 2016 are constant for the next 5 years and then increase at an annual rate of 1% in the long run. (**10 points**)
2. Assume that PHARMA is quoted at beginning of 2017, determining a market-to-book value equal to 1.5. After this operation what is possible to deduct concerning the evaluation of investors on the future of the company? **(3 points)**

SOLUTION

POINT 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Bonds |  |  |  |  |
| Number | 125000 |  |  |  |
| Face value | 1000 |  |  |  |
| Coupon rate | 0.04 |  |  |  |
| Disbursement of coupons | 0.5 | 1.5 |  |  |
| spot rate | 0.0285 | 0.0355 |  | 0.0705 |
| spread | 0.035 | 0.035 |  |  |
| Coupon amount | 40 | 1040 |  |  |
| Price | 977.7609432 |  |  |  |
| Yield | 7% |  |  |  |
|  |  |  |  |  |
| Debt bonds (M Euro) | 122.2201179 |  |  |  |
| Bank debt (M Euro) | 65 |  |  |  |
| Rd (bank debt) | 5% |  |  |  |
| Rd average | 0.063056302 |  |  |  |
|  |  |  |  |  |
| Spot rate curve |  |  |  |  |
| 0.025 |  |  |  |  |
| 0.007 |  |  |  |  |

Competitor

|  |  |
| --- | --- |
| Earnings 2016 | 70 |
| ROE 2016 | 0.233333333 |
| Dividends 2016 | 25.2 |
| Payout ratio | 0.36 |
| g | 0.149333333 |
| Dividend per share 2017 (Eur) | 3.218133333 |
| Actual price of shares | 44.44444444 |
| Return (ru) | 0.221741333 |

|  |  |
| --- | --- |
| UCF PHARMA year 2016 |  |
|  |  |
| EBIT | 86 |
| Net earnings | 60.2 |
| Amortization costs | 10 |
| Variation Account receivable | -2 |
| Variation Account Payable | 3 |
| Variation Invesntory | 5 |
|  |  |
| UCF | 70.2 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Years | 1 | 2 | 3 | 4 | 5 | 6 |
| CF | 70.2 | 70.2 | 70.2 | 70.2 | 70.2 | 70.902 |
| PV | 57.45897113 | 47.03038979 | 38.4945557 | 31.5079425 | 25.7893726 |  |
| TV |  |  |  |  | 334.851958 |  |
| PV of TV | 123.0145572 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| PV tax shields | 56.16603537 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| V firm | 379.4618243 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| E | 192.2417064 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| D | 187.2201179 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| re | 0.338820001 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| rwacc | 0.188920294 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Target price | 12.81611376 |  |  |  |  |  |

POINT 2

|  |  |
| --- | --- |
| Market to book | 1.5 |
| Stockholders equity book | 180 |
| Value at quotation | 270 |
| Price at quotation | 18 |
|  |  |
| Earnings in2016 |  |
| EBIT | 86 |
| Interest expense bonds | 5 |
| Interest expense debt | 3.25 |
| Earnings before taxes | 77.75 |
| Earnings | 54.425 |
|  |  |
| EPS | 3.628333333 |
| p/e | 4.960955443 |
| p/e of the competitor | 5.714285714 |

Market price reflects a greater value with respect to the one calculated on the basis of constant cash for 5 and subsequent growth at 1% (18>12). The p/e is a little bit lower than the one of the competitor and indicates growth perspectives in line with the sector.

EXERCISE n.3  **(3 points)**

Assume that on a market in equilibrium and that satisfies the assumptions of CAPM the market portfolio is made of 2 securites A e B, those historical returns present a correlation coefficient equal to -0.2. One investor has at disposal 10,000 Euros. What is the optimal allocation of such resources if the investor is willing to assume a level of risk equal to the one of security B? Determine the return of the market portfolio and the quantity of securities purchased by the investor. Illustrate the hypotheses underlying the solution.

|  |  |  |
| --- | --- | --- |
| Securites | A | B |
| Price (euro) | 20 | 30 |
| Beta | 0,75 | 1,37 |
| Variance | 1,40% | 1,80% |
| Return | 10% | 15% |

SOLUTION

|  |  |  |
| --- | --- | --- |
|  | A | B |
| Price | 20 | 30 |
| Beta | 0.75 | 1.37 |
| Variance | 1.40% | 1.80% |
| Return | 10% | 15% |
| Correlation AB | -0.2 |  |
|  |  |  |
| rm | 12% | 12% |
|  |  |  |
| rf | 4% | 4% |
| Cov AB | -0.32% |  |
| Market variance | 0.64% |  |
| Market standard deviation | 7.99% |  |
| Beta market portfolio | 1 |  |
| WA | 0.5968 |  |
| WB | 0.4032 |  |
| rm | 0.12 |  |
| rf | 0.04 |  |
| Return on CML | 0.17432571 |  |
|  |  |  |
| W in rf | -0.679 |  |
| W in rm | 1.679 |  |
| Amount available | 10000 |  |
|  |  |  |
| Allocation with short selling |  |  |
| Indebtness at rf 4% | 6790 |  |
| Investment in A | 10020 |  |
| Number of shares A | 501 |  |
| Investment in B | 6770 |  |
| Number of shares B | 226 |  |

EXERCISE n.4  **(2 punti)**

In the context of the dividend discount model, explain what is meant by NPVGO. In what circumstances calculating the NPVGO is better than other methods of share valuation? Explain how to determine the Price to Earnings ratio given the NPVGO and discuss what the ratio means.