

Financial management midland energy resources finance essay



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In the Midland Energy Resources case study we see that it has its operations divided amongst three separate divisions. All these three divisions have different functions and need a separate discount rate to evaluate its projects. Midland uses its cost of capital for many different ways. In order to discount Midland's cash flows we use the weighted average cost of capital. Here the cost of debt is easier to calculate by taking the “bond yield plus risk premium” approach. The Capital Asset Pricing Model is used to calculate the cost of equity. In case of CAPM, the calculation of beta requires significant judgment. We use the industry data to calculate the beta.

Solution 1

Mortensen's estimates are used for the following

In case of asset appraisals for capital budgeting and financial accounting

In case of M&A proposals

In case of assessment of performances

In case of stock repurchase decisions at different divisions and business unit levels.

Solution 2

Calculating r_D

In this case Mortensen computed the cost of debt for each of the three divisions by adding a premium over the US treasury securities of a similar maturity.

In order to find r_D , we do not use CAPM but we use the interest rate that we are currently paying on the new loans.

Here we see that the consolidated spread to treasury is given as 1.62%

Thus, $r_D = 30 \text{ year yields to U. S Treasury bonds} + \text{Overall Consolidated Spread to Treasury}$

$$r_D = 4.98\% + 1.62\%$$

$$r_D = 6.60\%$$

Calculating the Tax rate

The tax rate is calculated on the basis on the Exhibit 1 as average over the years 2004, 2005 and 2006.

Therefore the tax rate come out to be $(\text{Midlands Income Taxes} / \text{Midlands Income Before Taxes and the Average across 2004, 2005, 2006}) = 39\%$

Calculating EMRP

Based on the exhibit in this case, we see that the traditional data showed is approximately 6.0% EMRP and the surveys show lower EMRP (2.5% to 4.7%) based on a research over the industry with the help from outsiders who have broader industry knowledge, which would result in a better and up-to-date EMRP.

Researches in consultation with its professional advisors, bankers and investors, as well as Wall Street analysts covering the industry agreed on the current estimate of 5.0%.

As the analysts on the industry, bankers and investors have broader information from different companies and executives, it can be concluded that the approach of outside consulting and the result of 5.0% estimate is appropriate.

Calculating r_E

Here we use 5.0% as its Equity Market Risk Premium.

The corporate $\hat{\beta}$ is publicly available, and as it represents corporate level $\hat{\beta}$, we'll use 1.25 as it is for Overall Corporate WACC calculation.

$$r_E = r_f + \hat{\beta}(\text{EMRP})$$

$$r_E = 4.98\% + 1.25(5\%) = 11.23\%$$

Calculating WACC

Given + Calculated information: r_E 11.23%, r_D 6.60%, tax rate 39%, D/E 59.3%, $E = 100$ units, $D = 59.3$ units, $V = 159.3$ units,

$$E/V = 0.62774639, D/V = 0.37225361$$

Using the formula we get, $\text{WACC} = r_E(E/V) + r_D(D/V)(1-t) = 8.548\%$

Solution 3

The company here, Midland, is a large enterprise and has diverse business units with different risks. In the case here we see that the Equity Beta represents the risk factor of those divisions. (Exhibit 5).

We also see here that the risk profiles and different here as per the division and the hurdle rates for those divisions should also be different and calculated based on the \hat{I}^2 of the division

In this case Midland should not use single corporate hurdle rate as this will mislead evaluation of the investments, and will result on Midland invest on risky projects and will become risky a corporate by time

But on the other hand if Midland invests on corporate level using the corporate level WACC.

Solution 4

Calculating E&P

$$r_E = r_f + \hat{I}^2(\text{EMRP})$$

$$r_E = 4.98\% + 1.15(5\%) = 10.73\%$$

$$r_D = r_f + \text{E\&P Spread to Treasury}$$

$$r_D = 4.98\% + 1.60\% = 6.58\%$$

$$r_E = 10.73\%$$

$$r_D = 6.58\%$$

tax rate= 39%

D/E= 39. 8%

E= 100units

D= 39. 8units

V= 139. 8units

E/V = 0. 715308

D/V= 0. 284692

WACC for E&P= 8. 818%

Calculating R&M

$r_E = r_f + \hat{\beta}^2(EMRP)$

$r_E = 4. 98\% + 1. 20 (5\%) = 10. 98\%$

$r_D = r_f + \text{R\&M Spread to Treasury}$

$r_D = 4. 98\% + 1. 80\% = 6. 78\%$

$r_E = 10. 98\%$

$r_D = 6. 78\%$

Tax rate= 39%

D/E= 20. 3%

$$E = 100 \text{ units}$$

$$D = 20.3 \text{ units}$$

$$V = 120.3 \text{ units}$$

$$E/V = 0.831255$$

$$D/V = 0.168745$$

The value of WACC = 9.825%

The business units all these industries of Midland operate on are different and thus they have different risk profiles and \hat{I}^2 's and also different credit ratings.

Also as a result the E&P and R&M have different WACC values.

Solution 5

In order to calculate the cost of capital in case of Petrochemical, we would search for the couple of companies which focus only on Petrochemical industry and then use their fact sheet in order to get an average on their \hat{I}^2 and D/E ratio.

By taking into account the data available to us (exhibit 5) and using the arithmetic averages on D/E ratio and \hat{I}^2 we can calculate cost of capital for Petrochemical division.

$$\text{Corporate } \hat{I}^2 = \text{Average (E\&P } \hat{I}^2, \text{ R\&M } \hat{I}^2, \text{ Petrochemical } \hat{I}^2)$$

$$1.25 = \text{Average (1.15, 1.20, Petrochemical } \hat{I}^2)$$

$$\text{Petrochemical } \hat{\beta}^2 = 1.40$$

$$r_E = r_f + \hat{\beta}^2(\text{EMRP})$$

$$r_E = 4.98\% + 1.40(5\%) = 11.98\%$$

$$r_D = r_f + \text{Petrochemical Spread to Treasury}$$

$$r_D = 4.98\% + 1.35\% = 6.33\%$$

$$\text{Corporate D/E} = \text{Average (E\&P D/E, R\&M D/E, Petrochemical D/E)}$$

$$59.3\% = \text{Average (39.8\%, 20.3\%, Petrochemical D/E)}$$

$$\text{Petrochemical D/E} = 117.8\%$$

$$r_E = 11.98\%$$

$$r_D = 6.33\%$$

$$\text{Tax rate} = 39\%$$

$$\text{D/E} = 117.8\%$$

$$E = 100 \text{ units}$$

$$D = 117.8 \text{ units}$$

$$V = 217.8 \text{ units}$$

$$E/V = 0.459137$$

$$D/V = 0.540863$$

The value of WACC = 7.589%