Boeing's strategy

Business, Industries

The Capital Assets Price Model (CAPM), is a model for pricing an individual security or a portfolio. Its basic function is to describe the relationship between risk and expected return, which is often used to estimate a cost of equity (Wikipedia, 2009). It serves as a model for determining the discount rate which is used in calculating net present value. The CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. The formula is: R = Rf + *(E(Rm)-Rf) Rf = Risk free rate of return, usually U. S. treasury bonds ( ) ? = Beta for a company

E(Rm) = Expected return of the market (commercial airlines market) E(Rm)-Rf = Sometimes referred to as the risk premium The beta and risk-free rate should be selected as required according to the Boeing 7E7case study. For the CAPM the risk free rate of return for a given period is taken to be the return on government bonds over the period. The risk free rate of return at the time of this case was 4. 56% (Bruner, p. 239, 2007). At the time of the case, four main estimatesof equity market risk premiums (EMRP) were: 6. 4% = Geometric mean over T-bills 4. 7% = Geometric mean over T-bonds 8. 4% = Arithmetic mean over T-bills . 4% = Arithmetic mean over T-bonds For the purpose of analysis we will use 6. 4% EMRP, thus (E(Rm)-Rf) = 6. 4 %. () The cost of equity is determined by the company's levered Beta (). This is calculated according to the ' Hamada equation': ? l = ? u (1+(1-T)(D/E)) ? l = company's levered Beta ? u = company's unlevered beta (It is a beta assuming the firm is completely equity financed, which reflects pure business risk) T = effective marginal tax rate D/E = market-value debt/equity ratios Exhibit 10 provided seven different betas that can be used for the capital assets price model and discount rate calculation.

The project of building airplanes is a long-term venture with the life p more than five years. Boeing created a sales and cash flow forecast for the next 30 years, based on Exhibit 8. This is why for the calculation we use the Beta calculated over the longer period of time. Out of the three Betas calculated for the period of time 5 years, (1. 05, 0. 80, 1. 00), we take 0. 80, the figure calculated against the S&P 500 index. It uses the weighted market value, which can actually reflect the importance of company's securities in the market shares and the boarder market changes (Wikipedia, 2009). 0. 8 = ? u (1+(1-0. 5)*0. 525) Beta Asset = 0. 6 (overall risk of airplane industry) Total beta for Boeing equals to weighted beta from commercial business plus weighted beta for defense business. Beta = (%commercial)

Beta Commercial + (%defense)* Beta Defense. The average unlevered Beta for defense business among Lockheed Martin, Northrop Grumman and Raytheon is 0. 28 = (0. 28+0. 24+0. 31)/3. () Exhibit 1 shows commercial business generated $28, 387 million in revenue and the defense systems segment generated $24, 957 in revenue in 2002. Thus the weight of commercial business is 53% and the weight of defense systems business is 47%.

In addition, commercial business generated $9, 726 million in identifiable assets and the defense systems segment generated $12, 753 in identifiable assets in 2002. Thus the weight of commercial business is 43% and the weight of defense systems business is 57%. 0. 6 = 53%*Beta Commercial +47%*0. 28 Beta Commercial = 0. 88 0. 6 = 43%*Beta Commercial +57%*0. 28 Beta Commercial = 1. 02 There are two betas (0. 88, 1. 02) calculated for

the risk of this industry, we choose the larger figure 1. 02. This indicates the larger discount rate for the project evaluation thus it could provide the more pessimistic scenario.

The larger the discount rate from the CAPM, the more inflation we assume in our projection.

Calculation of CAMP: R = 4. 56 +6. 4*1. 02= 11. 08% The appropriate required rate of the return for evaluation the 7E7 project is 11. 08%. In EHHIBIT 10, it shows market-value debt/equity ratios, so it assumes that this ratio reflects the Boeing's capital structure and using only debt and equity asfinancethe 7E7 commercial aircraft project in this case. There are two formulas to calculate the weight of debt and equity as show below: Debt/Equity= 0. 525 (D/E= 0. 525) Debt+Equity= 1 (D+E= 1); D= 1-E

Using the second formula substituting back into the first equation and the result is 1-E/E= 0. 525, so through calculating this equation, it can indicate that E is 0. 656 and D is 1-0. 656= 0. 344. The Boeing's capital structure is that the weight of debt is 34. 4% and the weight of equity is 65. 6%. From this case, it gives a well-known formula how to finance Boeing's weighted-average cost of capital (WACC), it shows below: WACC= (percent Debt) (Pretax cost of debt capital) (1- Marginal effective corporate tax rate) + (percent Equity) (Cost of equity capital) In previous calculation, it already know the percent Debt is 34. %, percent Equity is 65. 6%, Cost of equity capital is 11. 088% and in this case gives Marginal effective corporate tax rate is 35%. So it only just to calculate cost of Debt. The cost debt is the

interest rate or yield that a firm must pay on its bonds. In this case, it uses weighted average yield to maturity to calculate cost of debt.

Through the form of EXHIBIT 11 and using two column debt amount and yield to maturity to finance cost of debt is 5. 286%, however, the appropriate cost of debt is the after-tax cost of debt, so the final cost of debt is 5. 86%*(1-35%)= 3. 436%. All of variables is known, so it can calculate WACC= 34. 4%*3. 436+65. 6%*11. 088%= 8. 46%. The IRR which is consistent with ' base case' assumption was 15. 7% in the EXHIBIT 9 of case study. In this case, it shows that IRR (15. 7) is greater than WACC (8. 46%), so the 7E7 commercial aircraft project is quite attractive for Boeing. In the ENHIBIT 9, it indicates that the unit volume for the first 20 years will only be 1500 with 0% price premium above expected minimum price, under this worse circumstance, IRR still have 10. % which is still greater than WACC (8. 46%). Obviously, developing of the 7E7 commercial aircraft project is acceptable. The IRR is expected to be 15. 7%, while WACC is estimated to be 8. 46%, leaving a difference of 7. 24%. This excess will add value to Boeing's stock and the company will believe that developing of the 7E7 commercial aircraft project is a worthy investment. In the EXHIBIT 9, there is another factor development costs which influence on the IRR of the 7E7 commercial aircraft project. Developmental cost could make or break the IRR of the aircraft.

Boeing company could consider how to control the cost of development, if the company cannot control the developmental costs, the result is that the delivery delays and the company will give discounts to consumers, this will lead to IRR goes down. The Boeing use of composite material could change

the manufacturing process, the machinery and the labor skills, so Boeing should recognize that the 7E7 project maybe have the potential for product cost and price inaccuracies and Boeing's managers should concern how to reduce the development costs.

Under the worst condition, from the form of EXHIBIT 9, it shows that development costs is $10, 000, 000, 000 with cost of goods sold as a percentage of sales is 84%, that is IRR is 8. 6% still higher than WACC (8. 46%). Therefore, developing the 7E7 commercial aircraft project is an attractive project. From WACC this perspective to consider whether the 7E7 project is economically attractive or not, the WACC calculates an overall return that a corporate exist assets and business in order to increase or maintain the current value of current stock.

In this case, it knows that Boeing's stock price closed at $36. 41 and from the definition of WACC, it can understand that the Boeing must earn at least 8. 46% return from this 7E7 project in order to maintain this stock price. It also indicate that discount rate for this company is 11. 088%, compare with WACC 8. 46%, it means that the company under the safety circumstance to calculate net present value. In the previous calculation, cost of equity is 11. 088% and it can compute NPV is $2546. 74. The NPV is greater than zero, so the 7E7 commercial aircraft project is a profitable investment.