



# CORPORATE FINANCE REVIEW FOR FIRST QUIZ

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# Basic Skills Needed

- What are the potential conflicts of interest that underlie a business and how do they manifest themselves in practice?
- Can you read a regression of stock returns against market returns?
  - ▣ How would you use the intercept to measure stock price performance?
  - ▣ What does the slope of the regression measure?
  - ▣ What does the R squared of the regression tell you about risk?
- .Can you use the beta to estimate an expected return on an investment?
- .What are the three factors that determine betas?
  - ▣ What is the relationship between leverage and beta?
  - ▣ How do you estimate a new beta if a firm changes its leverage?
  - ▣ In general, how is the unlevered beta related to the assets that a firm has on its balance sheet? What effect do acquisitions and divestitures have on this unlevered beta?

# Corporate governance.. Use common sense...

- Assume that you are currently a stockholder in a firm that is the target of a leveraged buyout. From the perspective of conflicts of interests between you and management, which of the following should concern you the most about this transaction?
  - ▣ The fact that the company will go private after the transaction
  - ▣ The possibility that equity investors in the LBO can make huge returns
  - ▣ The fact that the managers of your firm are also part of the acquisition team
  - ▣ The use of a disproportionate amount of debt to fund the transaction
  - ▣ None of the above
- We usually see the stock prices of the target firm in an LBO jump on the announcement of an LBO. This can be viewed as evidence that
  - ▣ Markets are inefficient
  - ▣ Markets are efficient
  - ▣ Cannot tell without more information

# Reading a Regression: The Intercept

Intercept –  $R_f (1 - \text{Beta}) = \text{Jensen's alpha}$

This is what the stock actually did in a month in which the market did nothing

This is what the stock was expected to do in a month in which the market did nothing

Excess Return

# Key concepts to keep in mind about the intercept

- It is the difference between the two (the intercept and the riskfree rate  $(1-\beta)$ ) that matters
- The intercept and the riskfree rate have to be stated in the same terms – if one is monthly, the other has to be monthly as well.

# An Example

- You have run a regression of returns of Devonex, a machine tool manufacturer, against the S&P 500 Index using monthly returns over the last 5 years and arrived at the following regression:

$$\text{Return}_{\text{Devonex}} = -0.20\% + 1.50 \text{Return}_{\text{S\&P 500}}$$

- If the stock had a Jensen's alpha of +0.10% (on a monthly basis) over this period, estimate the monthly riskfree rate during the last 5 years.

# The Solution

Data given: Jensen's alpha = 0.1%, Intercept = -0.2%,  
Beta = 1.5;

Find: Riskfree rate

The Jensen's alpha is the difference between the actual intercept and the expected intercept of  $R_f(1-b)$ , i.e.

$$-0.20\% - R_f(1-1.5) = .10\%;$$

Solving, we find that  $R_f = 0.6\%$ .

What if I had asked you for an annualized riskfree rate?

# Annualizing Rates

- Annual Riskfree Rate =  $(1.006)^{12} - 1 = 7.44\%$
- What if I had told you that the Jensen's alpha was 2.4% on an annualized basis (instead of 0.1% on a monthly basis)?



# From betas to expected returns...

- Beta is a measure of the market risk in an investment. The expected return on an equity investment, which is also the cost of equity, can be written as
- Cost of Equity = Riskfree Rate + Beta (Risk Premium)
  - The riskfree rate should generally be long term, default free and currency matched.
  - The risk premium is generally estimated from historical data. It should be defined consistently with the riskfree rate. For emerging markets, an additional country risk premium may have to be added on. This country risk premium can be estimated
    - Simply by adding the default spread based upon the country rating to the US risk premium
    - In a more sophisticated way, by estimating the relative equity market volatility and then adjusting the default spread for this relative volatility.
  - The risk premium can also be estimated from the market, in which case it is called an implied equity premium. When we use this premium, we essentially assume that the market is correctly priced.

# The riskfree rate and risk premiums: An example

- You have been asked to review a beta regression done on Cemex, a large Mexican cement company, and the output is provided below:

$$\text{Returns}_{\text{Cemex}} = 0.25\% + 1.08 \text{Returns}_{\text{Bolsa}} \quad R^2 = 45\%$$

- The Bolsa is the Mexican equity index and the regression was done using two years of weekly returns.
- Assume now that the beta from this regression is correct and that you are trying to estimate the cost of equity for Cemex in Mexican pesos.
- The ten-year Mexican Government bond rate in pesos is 8.35% but the Mexican government has a local currency rating of AA, with a default spread of 0.65% associated with the rating.
- The risk premium for the US and other mature markets is about 4% and Mexican equities are three times more volatile than Mexican bonds. Estimate the cost of equity in pesos.

# Estimating cost of equity...

- Riskfree rate in pesos = Mexican Peso 10 year rate – Default spread for AA rated bond =  $8.35\% - 0.65\% = 7.70\%$
- Risk premium for Mexico
  - ▣ Equity risk premium for US (mature market) = 4.00%
  - ▣ Additional Risk premium for Mexico = 0.65% (3) = 1.95%
  - ▣ Total Equity Risk Premium for Mexico = 5.95%
- Cost of Equity
  - ▣ Riskfree rate = 7.70%
  - ▣ Beta = 1.08
  - ▣ Risk premium = 5.95%
  - ▣ Cost of equity =  $7.7\% + 1.08 (5.95\%) = 14.13\%$
- How would your answer be different if I told you that Cemex gets half its revenues in the US and half in Mexico?

# Betas and Fundamentals

- The beta of a firm reflects three fundamental decisions a firm makes
  - a. The type of business it is in, and the products and services it provides. The more discretionary these products or services, the higher the beta.
  - b. The cost structure of the business as measured by the operating leverage
  - c. The financial leverage that the firm takes on; higher financial leverage leads to higher equity betas

# The Example: Financial Balance Sheet

You have been asked to estimate the levered beta for GenCorp, a corporation with food and tobacco subsidiaries. The tobacco subsidiary is estimated to be worth \$ 15 billion and the food subsidiary is estimated to have a value of \$ 10 billion. The firm has a debt to equity ratio of 1.00. You are provided with the following information on comparable firms:

Business	Average Beta	Average D/E Ratio
Food	0.92	25%
Tobacco	1.17	50%

All firms are assumed to have a tax rate of 40%.

<i>Assets</i>		<i>Liabilities</i>	
Tobacco	\$ 15 billion	Debt	\$12.5 billion
Food	\$ 10 billion	Equity	\$ 12.5 billion
Total	\$25 billion	Total	\$ 25 billion

# Calculating the Unlevered Beta

- To find the unlevered beta of the firm, we need the unlevered betas for tobacco and food. The betas given for the industry are levered betas (regression betas always are), and the average debt/equity ratios for the industry are used.
  - Unlevered Beta for Food Business =  $0.92 / (1 + (1 - .4)(.25)) = 0.8$
  - Unlevered Beta for Tobacco Business =  $1.17 / (1 + (1 - .4)(.5)) = 0.9$
- How would your answers have changed if I told you that the cash/firm value in both businesses was 10%?

# An Updated Balance Sheet

<i>Assets</i>			<i>Liabilities</i>	
	Value	Beta		
Tobacco	\$ 15 billion	0.9	Debt	\$12.5 billion
Food	\$ 10 billion	0.8	Equity	\$12.5 billion
Total Firm	\$ 25 billion	$0.9 (15/25) + 0.8 (10/25) = 0.864$	Total Firm	\$ 25 billion

# The Effects of Leverage

- Unlevered Beta = 0.864
- Levered Beta for the Firm =  $0.864 (1 + (1-.4) (12.5/12.5)) = 1.376$
- Cost of Equity =  $6\% + 1.376 (5.5\%) = 13.57\%$



# Divestiture of food business

- Now, let's assume that the company divests itself of the food business and gets fair value for the divestiture? What will happen to the beta of equity?

<i>Assets</i>			<i>Liabilities</i>	
Tobacco	\$ 15 billion	0.9	Debt	\$12.5 billion
Cash	\$ 10 billion	0	Equity	\$12.5 billion
Total Firm	\$ 25 billion	$0.9 (15/25) + 0 (10/25) = 0.54$	Total Firm	\$ 25 billion

Levered Beta for the Firm =  $0.54 (1 + (1-.4) (12.5/12.5)) = 0.864$

## Now, let's use cash to pay off debt

- Assume that the company decides to use the \$10 billion in cash to pay off debt. What will happen to the equity beta?

<i>Assets</i>			<i>Liabilities</i>	
Tobacco	\$ 15 billion	0.9	Debt	\$2.5 billion
Cash	0	0	Equity	\$12.5 billion
Total Firm	\$ 15 billion	0.9	Total Firm	\$ 15 billion

Levered beta for the firm =  $0.9 (1 + (1-.4) (2.5/12.5)) = 1.008$

## What if the cash were used to buy back stock?

- Assume that the company decides to use the \$10 billion in cash to buy back stock. What will happen to the equity beta?

<i>Assets</i>			<i>Liabilities</i>	
Tobacco	\$ 15 billion	0.9	Debt	\$ 12.5 billion
Cash	0	0	Equity	\$ 2.5 billion
Total Firm	\$ 15 billion	0.9	Total Firm	\$ 15 billion

Levered beta for the firm =  $0.9 (1 + (1-.4)(12.5/2.5)) = 3.60$

What if the cash were used to pay a dividend of \$ 2.5 billion, pay down debt of \$ 7.5 billion

- Assume that the company decides to use the \$5 billion to pay a dividend and the remaining \$7.5 billion to pay down debt. What will happen to the equity beta?

<i>Assets</i>			<i>Liabilities</i>	
Tobacco	\$ 15 billion	0.9	Debt	\$ 5 billion
Cash	0	0	Equity	\$ 10 billion
Total Firm	\$ 15 billion	0.9	Total Firm	\$ 15 billion

$$\text{Levered beta for the firm} = 0.9 (1 + (1-.4)(5/10)) = 1.17$$

## What if the cash were used to buy a social media firm for \$ 10 billion

- Assume that the company decides to use the \$10 billion in cash to buy a social media company. What will happen to the equity beta? (Social media companies have an unlevered beta of 1.80)

<i>Assets</i>			<i>Liabilities</i>	
Tobacco	\$ 15 billion	0.9	Debt	\$12.5 billion
Social Media	\$ 10 billion	1.8	Equity	\$12.5 billion
Total Firm	\$ 25 billion	$0.9 (15/25) + 1.8 (10/25) = 1.264$	Total Firm	\$ 25 billion

Levered beta for the firm =  $1.264 (1 + (1-.4)(12.5/12.5)) = 2.02$

# What if the cash is used plus debt of \$ 5 billion to buy a social firm for \$ 15 billion

- Assume that the company decides to borrow \$5 billion, and use it with the \$10 billion in cash to buy a social media company for \$15 billion. What will happen to the equity beta?

<i>Assets</i>			<i>Liabilities</i>	
Tobacco	\$ 15 billion	0.9	Debt	\$17.5 billion
Social Media	\$ 15 billion	1.8	Equity	\$12.5 billion
Total Firm	\$ 30 billion	0.9 (15/30) + 1.8 (15/30) = 1.35	Total Firm	\$ 30 billion

Levered beta for the firm =  $1.35 (1 + (1-.4)(17.5/12.5)) = 2.48$

# Test yourself...

	<i>Assets</i>	<i>Unlevered Beta</i>	<i>D/E Ratio</i>	<i>Levered Beta</i>
Sell Asset	Replace asset with cash	Decrease	No effect	Decrease
Buy asset with cash on hand				
Buy asset with new stock or equity issue				
Buy asset with new debt				
Pay dividend				
Buy back stock				
Retire debt				