

### Key to 1:25 Quiz: 2/29/12

**Quiz:** Use the following information to calculate the beta of T (AT&T) and the beta of a portfolio where you invest \$200,000 in T and \$300,000 in Dell which has a beta of 1.33.

Return on:		
<u>Year</u>	<u>T</u>	<u>S&amp;P500</u>
2011	+13%	+2%
2010	+16%	+20%
2009	+10%	+30%
2008	-33%	-40%

$$\beta_p = \left( \frac{200,000}{200,000+300,000} \right) \beta_T + \left( \frac{300,000}{200,000+300,000} \right) 1.33$$

$$\beta_T = \frac{\text{Cov}(R_T, R_{S\&P})}{\text{Var}(R_{S\&P})}$$

$$\text{Cov}(R_T, R_{S\&P}) = \frac{1}{3} \left( (13 - \bar{R}_T)(2 - \bar{R}_{S\&P}) + (16 - \bar{R}_T)(20 - \bar{R}_{S\&P}) + (10 - \bar{R}_T)(30 - \bar{R}_{S\&P}) + (-33 - \bar{R}_T)(-40 - \bar{R}_{S\&P}) \right)$$

$$\bar{R}_T = \frac{1}{4} (13 + 16 + 10 - 33)$$

$$\bar{R}_{S\&P} = \frac{1}{4} (2 + 20 + 30 - 40)$$

$$\text{Var}(R_{S\&P}) = \frac{1}{3} \left( (2 - \bar{R}_{S\&P})^2 + (20 - \bar{R}_{S\&P})^2 + (30 - \bar{R}_{S\&P})^2 + (-40 - \bar{R}_{S\&P})^2 \right)$$