**Session 4: Post Class tests**

1. Most analysts and appraisers get their equity risk premium by looking at the past: the historical risk premium is the difference between what you would have earned invested in stocks over a past period over what you would have earned on a risk free investment. Which of the following are problems with this approach?
    a. The estimate is "subjective", since it depends upon the time period and averaging approach used.
    b. The estimate is backward looking
    c. The estimate has substantial standard error
    d. The estimate moves counter intuitively: down after crisis and up after prosperity
    e. All of the above
2. The annual standard deviation in stock returns is about 20%. Assuming that annual returns are independent of each other, how many years of historical data will you need to lower the standard error in your estimate to 1%?
    a. 25 years
    b. 100 years
    c. 200 years
    d. 400 years
    e. None of the above
3. The implied equity risk premium is a forward-looking premium, estimated from the level of stock prices (the index) today and expected earnings/cash flows in the future. Assume that you compute the implied ERP at the start of a year and the market goes up 20% during the course of the year and that you compute the implied ERP again at the end of the year. Assuming that the risk free rate and growth rate do not change over the course of the year, which of the following would you expect to happen to the implied ERP?
    a. The ERP will go down
    b. The ERP will go down, if the earnings/ cash flows went up by less than 20% during the year
    c. The ERP will go down, if the earnings/ cash flows went up by more than 20% during the year
    d. The ERP will not change
    e. The ERP will go up
4. In the melded country risk premium approach, you estimate the country risk premium by multiplying the country default spread by the volatility of equity markets, relative to the volatility in government bonds in that market. Assume that your estimate for a mature market equity risk premium is 6%, that the default spread for Indonesia is 2% and that the standard deviation of Indonesian equities is 24% (while the standard deviation of the Indonesian government bond is 12%). Estimate the total equity risk premium for Indonesia
    a. 12%
    b. 8%
    c. 10%

d. 6%
e. 4%

5. Aspic Inc. is a US-based company that operates in two countries: the United States and Mexico. The total equity risk premium is 5% for the United States and 9% for Mexico. Which of the following estimates of the equity risk premium would you use for Aspic?
    a. 5%: the US equity risk premium, because it is US based
    b. 7%, a simple average of the US and Mexico equity risk premiums
    c. 6.2%, the weighted average based upon the revenues that the company gets from the two countries (70% from US, 30% from Mexico)
    d. 5.8%, the weighted average based upon the assets that the company has in the two countries (80% in the US, 20% in Mexico)
    e. 6.6%; the weighted average based upon the value that the company attaches to its operations in the countries (60% US, 40% Mexico)

**Session 4: Post class test solutions**

1. **e. All of the above.** Historical ERP are a function of your estimation choices, backward looking, noisy and move in counter intuitive ways. If stocks have a really bad year, as they tend to during a crisis, the historical risk premium will get smaller, not larger.
2. **d. 400 years.** If annual returns are independent, the standard error is the standard deviation divided by the square root of the number of years of returns that you have. With a 20% standard deviation, that would require 400 years.
3. **b. The ERP will go down, if the earnings/ cash flows went up by less than 20% during the year.** If the growth rate and risk free rate don't change, the effect will depend upon how much stocks go up, relative to earnings/cashflows. If the stock market goes up by more than earnings go up, the ERP will go down.
4. **c. 10%.** The country risk premium is 4%, obtained by multiplying the default spread of 2% by the relative standard deviation of equity (to bond) of 2 (24%/12%). This has to be added to the mature market equity risk premium of 6$ to get to the total equity risk premium of 10%.
5. **e. 6.6%.** the weighted average based upon the value that the company attaches to its operations in the countries (60% US, 40% Mexico). You want to use value weights for equity risk premiums optimally. In practice, we use revenues, assets or operating income as proxies but only because we do not have access to value.