Third Midterm Exam

No points will be given by simply writing down formulas, and writing down definitions or irrelevant statements from the book, or saying "yes," will get you zero points. Justify all your answers. If you cannot prove something give some intuition. Good luck. <u>Reminder</u>: this is an open book exam, but <u>no</u> open notes. <u>Time</u>: 1hr 25 minutes.

I. Problems (15 points each).

1. Bati Inc. considers investing excess funds at home, in the U.S., at 2% for 90 days. Bati also considers investing in Canada, in Japan and forming a portfolio with 30% invested in Canadian dollars (CAD) and 70% in Japanese yen (JPY). The forecasts of appreciation in the CAD and JPY for the 90 days are as follows:

Currency	$e_{f,T}$	Probability
CAD	1%	80%
CAD	5%	20%
JPY	0%	60%
JPY	2%	40%

The interest rate on the CAD is 3%, and the interest rate on the JPY is 1%. Where should Bati Inc invest: at home, in Japan, in Canada, or in the 70-30 portfolio?

2. On April 16. 2017, the U.S. Department of Justice (DOJ) gave a positive signal to approve German pharma giant Bayer AG's acquisition of the U.S. agrochemical company Monsanto (NYSE: MON). As a condition, Bayer will divest different assets valued at USD 7B.

Bayer announced the all-cash acquisition in September 2016 for USD 66 billion (or USD 128 per share), including assumption of debt. Bayer decided to finance the acquisition, with 75% debt, using funds from Bank of America and Credit Suisse, and 25% equity, higher than Bayer's current D/E ratio, which stands at 40%.

1) You want to determine the cost of capital of MON's acquisition for Bayer. Assume the USD cost of debt for U.S. agrochemical companies is 100 bps over government risk-free rate, which is 0%. Bayer issued 3-yr bonds at 5.45% in the U.S. to raise funds for the acquisition, while Monsanto borrowed at 3.15% in the U.S. Monsanto has a beta equal to 1.22. The U.S. stock market risk premium is 3.6%, while the German stock market risk premium has an average return of 4.1%. Monsanto's U.S. effective tax rate is 20%.

2) At the time of the agreement, in September 2016, Bayer calculated total synergies of USD 1.5B. In 2017, MON's free cash flows are close to USD 2B per year. Assume an average free cash flows growth rate of 1.5% per year (in perpetuity). What is the NPV of the acquisition? Would you have recommended the acquisition?

3) Calculate the break-even cash flows growth rate per year (in perpetuity). Would you have recommended the acquisition?

4) At the time of the agreement, the breakout fee that Bayer offered MON if the deal did not pass regulatory hurdles was USD 2B, which was considered very low –i.e., very far from "*break-even value*." A Bernstein analyst, Jonas Oxgaard, gave the deal a 50% chance of failure –i.e., not approved by the DOJ-; while an analysis by Bloomberg Law gave these deals a 30% probability of failure. Assume a 40% chance of failure. Recalculate the NPV, taking into account the probability of failure (and breakout fee under this scenario). Given your E[NPV], do you think the breakout fee was too low?

3. Suppose Fox Sports is considering buying the soccer league TV rights of Panamá, El Salvador, Guatemala, Nicaragua and Honduras. The success of the investments depends on the number of subscribers. If the number is "high", the total expected 5-year return (in USD) is 40% for Fox Sports per market; if the number is "low," the total expected 5-year return (in USD) is -20% for Fox Sports per market. Suppose, the probability of a high number of subscribers is 60%. To simplify suppose the upfront initial investment per market is USD 100. Evaluate the investment under 2 situations (a & b below), using a discount rate of 14%:

a.- Fox Sports decides to test one market, say Panama. If successful in test market, Fox Sports will enter the other (& assume Fox Sports now knows it will be successful in all the other markets).

b.- Fox Sports decides to buy all TV rights simultaneously.

4. The annual Central African CFA franc (XAF) interest rate in Gabon is 4% (s.a.), while the annual USD interest rate is 2% (s.a.). Houseman Bank (HB) entered into a currency swap where it receives 3% semi-annual in USD and pays 6% semi-annual in XAF. The principals in the two currencies are USD 5 million and XAF 2500 million. Principals are exchanged at maturity. The swap will last for another 12 months (2 payments left). The exchange rate is .002 USD/XAF. For simplicity, assume the term structure in Gabon and in the U.S. is flat.

A. Draw the swap cash flows.
B. Value this currency swap for HB, using the forward currency contract decomposition..
C. Suppose the Swap dealer is worried about the XAF payments and demands a 1% insurance premium – i.e., XAF interest payments are at 7%. What would be the effect of this insurance premium on the value of the swap for HB? Calculate the value of the swap.

II. CASE (25 points).
Note: No points will be given by simply writing lines from the article. Briefly justify your answers.

Read the attached Bloomberg article (April 24, 2017) and briefly answer the following questions:

1) According to what you learned in class, why is Fresenius buying Akorn? What kind of additional risks is Bayer taking?

2) Assume the USD cost of debt for big U.S. pharmaceutical companies is 100 bps over government risk-free rate, which is 1%. Last month, Fresenius borrowed at 2.25% in the U.S., while Akorn borrowed at 1.90% in the U.S. What would be the cost of debt of the Fresenius's acquisition of Akorn? Briefly justify your answer.

3) Does the acquisition of Akorn decrease, stay the same or increase Fresenius's cost of capital? Briefly explain (saying "increase" or "decrease" without justification will get you zero points).

4) Based on past performance, an analyst estimates the long-run rate of return for Akorn is 8.5%, while the rate of return for Fresenius (in EUR) is 6.2%. Assuming the historical rates of returns are a good forecast for future rates of return. By how much does the USD have to change relative to the EUR to make Fresenius's investment in Akorn unattractive?

5) During the past 60 years, Germany's inflation rate has consistently been lower than the U.S. rate, by 1%. How realistic is the scenario in 4)?