Topic 10: International Portfolio Diversification

1. As an investor, what factors would you consider before investing in the emerging stock market of a developing country?
2. Why might it be easier for an investor desiring to diversify his portfolio internationally to buy depository receipts rather than the actual shares of a company?
3. Explain the concept of the world beta of a security.
4. Explain how exchange rate fluctuations affect the return from a foreign market, measured in dollar terms.
5. During the year, Toyota Motor Company shares went from ¥ 9,000 to ¥ 11,200, while paying a dividend of ¥ 60. At the same time, the exchange rate went from \$1 = ¥ 145 to \$1 = ¥ 120. What was the total dollar return, in percent, on Toyota stock for the year? **(*)**
6. Suppose you are a euro-based investor who just sold Microsoft shares that you had bought six months ago. You had invested 10,000 euros to buy Microsoft shares for \$120 per share. The exchange rate was \$1.15 per euro. You sold the stock for \$135 per share and converted the dollar proceeds into euro at the exchange rate of \$1.06 per euro. First, determine the profit from this investment in dollar terms. Second, compute the rate of return on your investment in euro terms. How much of the return is due to the exchange rate movement? **(*)**
7. During the year the price of British gilts (UK government bonds) went from £102 to £106, while paying a coupon of £9. At the same time, the exchange rate went from £1:\$1.76 to £1:\$1.62. What was the total dollar return, in percent, on gilts for the year? **(*)**
8. Suppose that the standard deviation of the return on Nestle in terms of the Swiss francs is 19% and the standard deviation of the rate of change in the \$:Franc exchange rate is 15%. In addition, the estimated correlation between the Swiss Franc return on Nestle and the rate of change in the exchange rate is 0.17. Given these figures, what is the standard deviation of the dollar rate of return on investing in Nestle stock?

9. A portfolio manager is considering the benefits of increasing his diversification by investing overseas. He can purchase shares in individual country funds with the following characteristics: **(*)**

	U.S. (%)	U.K. (%)	Spain (%)
Expected return	15	12	5
Standard deviation of return	10	9	4
Correlation with U.S.	1.0	0.33	0.06

(a) What is the expected return and standard deviation of return of a portfolio with 75 percent invested in the United Kingdom and 25 percent in the United States? What about 25 percent invested in the UK and 75 percent in the US?

(b) What is the expected return and standard deviation of return of a portfolio with 75 percent invested in Spain and 25 percent in the United States? What about 25 percent invested in Spain and 75 percent in the US?

10. Why do investors invest the lion's share of their funds in domestic securities?

11. Studies show that the correlations between domestic stocks are greater than the correlations between domestic and foreign stocks. Explain why this is likely to be the case. What implications does this fact have for international investing?

12. Who is likely to gain more from investing overseas, a resident of the United States or of Mexico? Explain.

13. Comment on the following statement: "On October 19, 1987, the U.S. stock market crashed. As the globe turned the following day, the devastation spread from New York to Tokyo, Hong Kong, Sydney, and Singapore, and on to Frankfurt, Paris, and London, then back to New York. The domino-style spread of the crash from one market to the next accelerated as international investors attempted to outrun the wave of panic selling from Tokyo to London and back to New York. It is difficult to imagine that some investors thought they had been able to diversify their investment risks by spreading their money across different stock markets around the world, when in fact their downside risks were actually multiplying as one market followed another into decline." (October 19, 1987 is known as "Black Monday". The US market dropped approx. 22% in one day.)

14. Because ADRs are denominated in dollars and are traded in the United States, they present less foreign exchange risk to U.S. investors than do the underlying foreign shares of stock. Comment.

15. Will increasing integration of national capital markets reduce the benefits of international diversifications?
16. According to one investment advisor, “I feel more comfortable investing in Western Europe or Canada. I would not invest in South America or other regions with a record of debt defaults and restructuring. The underwriters of large new issues of ADRs of companies from these areas assure us that things are different now. Maybe, but who can say that a government that has defaulted on debt won't change the rules again?” Comment on this statement.
17. From 1949 to 1990, the Japanese market rose 25,000 percent.
    (a) Given these returns, does it make sense for Japanese investors to diversify internationally?
    (b) What arguments would you use to persuade a Japanese investor to invest overseas?
18. The Brazilian stock market rose by 165% during 1988. Are American investors likely to be pleased with that performance? Explain.
19. Suppose that over a ten-year period the annualized peseta return of a Spanish bond has been 12.1%. If a comparable dollar bond has yielded an annualized return of 8.3%, what cumulative devaluation of the peseta over this period would be necessary for the return on the dollar bond to exceed the dollar return on the Spanish bond?
20. In an attempt to diversify your portfolio internationally, you must decide how to invest in Brazil. You can invest in an index fund that replicates the Brazilian stock market, or you can buy shares of the Brazil Fund traded on the New York Stock Exchange. The covariance of dollar returns on the index with the S&P 500 is 0.02; the covariance of dollar returns on the Brazil Fund with the S&P 500 is 0.03; the variance of the S&P 500 index is 0.035; and the beta of the Brazil Fund with respect to the Brazilian index is 0.90. In addition, the Brazil Fund and the Brazilian index are expected to yield annual dollar returns of 21 percent and 19 percent, respectively, in contrast to expected annual returns of 18 percent from investing in the S&P 500. Ignoring other considerations, should you buy the Brazil Fund or the Brazilian index fund?
21. On 31/8/97 the French stock index price was FF213.67, the FF/$ exchange rate was 6.0973 FF/$, and the ¥/$ exchange rate was ¥118.86/$. One month later, on 30/9/97, the French stock index price was FF223.03, the FF/$ exchange rate was FF5.9322/$, and the ¥/$ exchange rate was ¥120.73/$. **(*)** ***Past exam question***

(a) What was the return on the French index during the month of September 1997 from an American investor's point of view?

(b) What was the return on the French index during the month of September 1997 from a Japanese investor's point of view?

(c) If the return on the French index during the month of September 1997 from a Swedish investor's point of view was 3%, did the Swedish krona appreciate or depreciate against the French Franc in September 97? How do you know?

22. What vehicles for international equity investment are available to an individual investor? Please provide a very brief explanation of some of the instruments. **(*)**

Past Exam Question

23. What characteristics of foreign securities lead to diversification benefits for Australian investors?

24. Suppose Mexican bonds are yielding more than 100% annually. Does this high yield make them suitable for American investors looking to raise the return on their portfolios? Explain.

25. Suppose during the first half of the year, Swiss government bonds yielded a local-currency return of -1.6%. However, the Swiss franc rose by 8% against the dollar over this six-month period. Corresponding figures for France were 1.8% and 2.6%. Which bond earned the higher U.S. dollar return? What was the return?

26. What are the likely impediments to International Diversification?

27. Suppose that the dollar is now worth €0.7423. If one-year German bunds are yielding 9.8% and one-year U.S. Treasury bonds are yielding 6.5%, at what end-of-year exchange rate will the dollar returns on the two bonds be equal? What amount of euro appreciation or depreciation does this equilibrating exchange rate represent?

28. You are an Australia based investor considering an investment in a European company. The Euro is currently at €1.08/dollar. In one year, you believe the Euro will be at €1.03/dollar. European investors believe they will earn a 15% return on the stock during the next year (these investors use Euros as their home currency). **(*)**

Past Exam Question

(a) What percent return can an Australian investor expect on this stock in the next year, taking into account effects from the Euro/dollar exchange rate changing during the holding period?

(b) Now assume that the Australian investor would like to invest in a portfolio of Australian and European stocks. The Australian portfolio has an expected return of 0.12 (twelve percent) and a variance of 0.06. Assume that the investor expects, *on a dollar basis*, the European stock market to generate an average return of 0.20 (twenty percent) with a variance of 0.09. The European stock market has a correlation of 0.4 with the Australian portfolio. Note: *Ignore your answer in (a) and use these numbers instead!*

Suppose the investor wants to construct a portfolio comprising of European and Australian stocks) that has an expected return of 14 percent. What are the portfolio weights?

(d) What is the variance of the portfolio constructed using the weights determined in (b)?

29. Your uncle, an avid international investor, just sold shares of IKEA, a Swedish firm, for Skr50. The shares were bought for Skr42 a year ago. The exchange rate is Skr5.8 per AUD now and was Skr6.65 per AUD a year ago. He received SKr4 as a cash dividend immediately before the shares were sold. Compute the rate of return on this investment in Australian dollar terms. **(*)** ***Past Exam Question***

30. (***Past Exam Question from 2023***)

State-owned Norwegian telecommunication firm BaneTele (BT) is to be privatized via an initial public offering (IPO). The planned IPO will involve selling 500 million new shares representing a 17% stake in BT. The global coordinators for the IPO are UBS, Goldman Sachs and Macquarie Bank of Australia. The announcement of the final share price is expected to be made in early April of 2024. The stock will start trading on April 22nd in Oslo and New York, the next day in Sydney.

BT's CEO Lars Thorwald is sweating on the pricing of the IPO. When he took the position as CEO, it was clear that BT's privatization would be a challenge. BT is expected will lose its monopoly on land lines and the growing threat from 5G and deregulation that could attract competition. The exact nature of the future regulatory environment is highly uncertain.

BT has 3 million subscribers and sales reached Krone (NOK) 16.1 billion. Currently, BT derives 95% of its revenues from sales in Norway. Virtually all costs are in NOK. Mr. Thorwald plans to increase revenue from foreign sources to 20% by the year 2030. To position BT for future international expansion, BT together with France Telecom acquired a 10% stake in Telstra of Australia. BT and France Telecom each paid $1.8 billion for 5% of Telstra.

BT, following privatisation, will list on multiple exchanges, and will now have to pay income tax though, it no longer has to pay for losses of other government owned entities. Furthermore, Mr. Thorwald needs the fresh capital to start paying off BT's considerable debt. The debt of BT is currently estimated to be NOK 100 billion at market value.

The IPO is the first tranche (slice) that will be sold to the public. It is expected that a second equally large tranche will be offered in 2026, followed by the sale of the government's majority stake in the company.

Despite the volatility in the markets, other national telecommunication firms in Europe have either recently raised capital or are contemplating listing on exchanges.

The IPO will be global. An estimated 50% of the issue will be sold in Norway, and the rest will be distributed in Europe (20%), US (20%), and Asia & Oceania (10%). Norwegian institutional demand is secured since BT's shares will represent and estimated 8-10% of the Oslo Bors All-share index. To generate interest from Norwegian retail investors. BT has spent more than NOK 40 million on advertising. An extensive roadshow is going on right now to drum up sufficient demand from foreign institutions.

Below are recent analysts' projections for BT earnings and other relevant data.

BaneTele Pro Forma (NOK billions)							
	2022	**2023**	**2024e**	**2025e**	**2026e**	**2027e**	**2028e**
Sales Growth	0.2	3.3	0.9	1.8	1.4	4.5	7.4
EBIT	5.9	6.3	5.0	5.5	2.2	7.5	13.0
Interest Expense	3.5	3.5	4.5	4.5	4.5	4.5	4.5
Earnings before tax	2.4	2.8	0.5	1.0	-2.3	3.0	8.5
Taxes (30%)	0.7	0.8	0.2	0.3	-0.7	0.9	2.6
Earnings after tax	1.7	2.0	0.4	0.7	-1.6	2.1	6.0
Depreciation	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Capital Expenditure	2.0	1.1	1.1	1.1	1.1	1.1	1.1
Free Cash Flow	0.7	1.9	0.3	0.6	-1.7	2.0	5.9
PV @ 11%				0.5	-1.4	1.5	3.9
NPV			4.5				
Terminal Value		51.6	60.8	73.6	92.9		
Growth rate		4%	5%	6%	7%		
Spot NOK/$			1.56				
Forward NOK/$				1.55	1.53	1.52	1.50
NOK Interest (%)			5	5	5	5	5
$ Interest (%)			6	6	6	6	6
NOK Risk Premium (%)			6	6	6	6	6
$ Risk Premium (%)			7	7	7	7	7

(a) Mr. Thorwald needs your input on the price-range for the roadshow. He strongly believes that this should be based on DCF analysis. What NOK price-range would you recommend based on the pro forma above? You may assume that the price should reflect the DCF as of 31/12/2024 and that all cash flows arrive at the end of each calendar year. Please clearly state and motivate additional assumptions you make for your analysis.

(b) Colonial Asset Management (CAM) calls you up and wants you to tell them what they should be willing to pay for BT's ASX listed shares. The manager for CAM's European Index portfolio is adamant that the valuation should be made based on DCF analysis. She tells you that based on recent historical data, the correlation between the Norwegian and the Australian stock market is 0.75 and that the annualized standard deviation of returns in Norway is 0.18 and in the Australia is 0.15. Should you simply send them the one you did for Thorwald and be done with it? Why? Why not?

(c) What three major risks would you suggest should be disclosed in the IPO prospectus?