Topic 6: Economic Exposure

NOTE: I have set **more** questions than can be covered in a 2-hour session. The questions to be covered in the tutorial are indicated by an asterisk (*) in the file that ***only*** contains questions. The rest should be viewed as ***extra*** practice problems.

1. How would you define economic exposure to exchange risk?
2. You have been given the following information for Argentina and Australia

Year	Argentinian Price Index	Australian Price Index	Exchange Rate
2013	100	100	$0.02564/Peso
2023	160	130	$0.02564/Peso

What is the change in the real value of the peso? (*)

3. In 2022, the yen was 81.36 to the AUD. The headache for the Japan is the strength of its currency and despite this rate being below its all-time high of 79.75 which it had reached ten years earlier. Over the same 2012-2022 period, Australian prices have risen by 69.5%, whereas Japanese prices by 8.5%. What is the real exchange rate, in 2022 and by how much have the two currencies changed in real terms over the ten-year window? (*)
4. You have been given the following information for the Vietnamese dong (VND) and the Australian dollar. (*)

Year	Vietnam CPI	Australia CPI	Exchange Rate
Jan 2022	100	100	$0.02/VND
Dec 2022	200	100	$0.02/VND

a. What is the real exchange rate at the end of 2022?

b. Suppose Hanoi Shoes Ltd exports shoes to Australia that sell for $10. The local price of a shoe is 500 dong and it costs 200 dong to manufacture them. Assume costs increase in line with inflation. Document the likely impact of inflation on the firm's profitability if there is no change in the exchange rate?

c. Now consider a second scenario where the dong declines in value against the dollar to \$0.01/VND by the end of the year. What is the likely impact on the real exchange rate and on the Hanoi Shoes' profit margin?

5. Explain the competitive and conversion effects of exchange rate changes on the firm's operating cash flow.
6. Discuss the determinants of operating exposure.
7. General Motors exports cars to Spain, but the strong dollar against the euro hurts sales of GM cars in Spain. In the Spanish market, GM faces competition from Italian and French car makers, such as Fiat and Renault, whose operating currencies are the euro. What kind of measures would you recommend so that GM can maintain its market share in Spain?
8. Exchange rate uncertainty may not necessarily mean that firms face exchange risk exposure. Explain why this may be the case.
9. If PPP holds, does the firm face any exchange rate risk? Explain. **(*)**
10. In the annual results of Nestle, a large, diversified Swiss-based food company with operations in more than 100 countries, management states that it does not hedge foreign exchange exposure. What might be the rationale behind this policy? **(*)**
11. In order to avoid speculation, Honda hedges only the sales it has clinched, not the ones it expects. Comment on Honda's currency risk strategy. (*)
12. A proposed foreign investment involves a plant whose entire output of 1 million units per annum is to be exported. With a selling price of \$10 per unit, the yearly revenue from this investment equals \$10 million. At the present rate of exchange, dollar costs of local production equal \$6 per unit. A 10 percent devaluation is expected to lower unit costs by \$0.30, while a 15 percent devaluation will reduce these costs by an additional \$0.15. Suppose a devaluation of either 10 percent or 15 percent is likely, with respective probabilities of 0.4 and 0.2 (the probability of no currency change is 0.4). Depreciation at the current exchange rate equals \$1 million annually, while the local tax rate is 40 percent.
    (a) What will annual dollar cash flows be if no devaluation occurs?
    (b) Given the currency scenario described above, what is the expected value of annual after-tax dollar cash flows assuming no repatriation of profits to the United States?
13. Why should managers focus on marketing and production strategies to cope with foreign exchange risk? (*)

14. ***Past Exam Question from 2021*** (*)

Intel, a large US semiconductor company, has 15% of the microprocessor market. Its closest foreign competitors Samsung Electronics and Synix of South Korea have 12.5% and 5.4% of the market respectively. Since, both these firms are based in South Korea, most of their costs are denominated in Korean Won (hereafter denoted as won). A depreciation of the won lowers cost structures of Korean firms relative to their U.S. based competitors. This reduction in costs should lead to higher gross margins which can be passed on to customers in the form of lower prices thereby allowing Korean firms to increase their U.S. market share. For U.S. firms however, this means lower profits which impacts on their firm value.

Industry sources estimate that the Korean firms are unprofitable when their currency was stronger than 1100 won per dollar and profitable when it is 1200 or more won per dollar. A semiconductor that is made in Korea is comprised of 30% locally sourced inputs. The costs for these inputs, given in won terms, include the price of labour, silica etc. Given a large fraction of costs are sourced in Korea, it allows the Korean manufacturers to reduce the prices they charge U.S. based customers when the won depreciates. Industry estimates indicate that the Korean manufacturers pass on 30% of cost savings to American customers. It is estimated that American firms, to maintain market share, give up $19.20, a third of their profits, to retain their existing customers.

Sales numbers are highly dependent on prices, where a 5% increase in price reduces the number of units sold by 10% (i.e., elasticity is 2 (0.10/0.05)). A depreciating won would affect sales of the three American manufacturers equally. It is expected that the two Korean firms have sold 179 million microprocessors in the U.S. this year (17.9% of the total unit sales). The average price of a microprocessor in the U.S. is $120.

(i) Assume that that won depreciates against the dollar by 20%. By how much, in percentage terms, would the costs of Korean sourced inputs decline, in USD terms?

(ii) <u>If the reduction in costs determined</u> in (a) is passed on to American customers, by how much (in percentage terms) would the prices these customers see decline by?

(iii) How would you expect the sales of Korean manufacturers to change by? Provide an estimate of this.

(iv) How many fewer microprocessors will Intel, the U.S. firm, sell?

(v) By how much would Intel's profits drop by?

(vi) How should Intel manage the competitive exposure it faces?

Part B

(Note: This is a question on Transaction Exposure. And if you read closely, you will notice a similarity to the lecture example.)

It's early March 2022 and the Commonwealth Serum Laboratories (CSL) has just started exporting COVID vaccines from its facilities in Melbourne to Europe. This has resulted in an accounts receivable of €5 million due in late June. Its treasury department which is tasked with hedging the resultant exposure due to this transaction, gets the following information from Bloomberg.

- Spot rate: 158.34 cents per Euro (EUR).
- EUR 90-day interest rate: 0.40% p.a.
- AUD 90-day interest rate: 0.20% p.a.
- Forward rate (90 day): 158.05 cents per EUR.

Exercise Price	Call Price (cents/EUR)	Put Price (cents/EUR)
158 cents/EUR	5.00	4.81
159 cents/EUR	4.52	5.33
160 cents/EUR	4.08	5.89

(i) What is the minimum net revenue the firm will receive if it uses options contracts?

(ii) At what future exchange rate would the cashflow from using options exceed that from using forward contracts?

15. ***Past Exam Question from*** 2022 (*)

Consider the operations of Asahi Beverages of Australia in Poland. It produces all its soft drinks (e.g., Solo, Schweppes Lemonade) in Poland and all of its costs of production are at local Polish prices. It sells some fraction of its output to Poland and some fraction to Czech Republic. See the following information below.

Sales: 600,000 cans in Poland and 400,000 cans in Czech Republic
Price per can of Solo: 1 zloty in Poland and 2 koruna in Czech Republic
Cost of manufacturing a can of Solo: 0.5 Polish zloty
Nominal exchange rate relative to the AUD:

Poland – 1 zloty/Australian dollar; Czech Republic – 2 koruna/Australian dollar

(a) Calculate the Australian dollar profits of Asahi Beverages of Australia.

(b) Following a currency crisis in Poland the zloty devalued to 3 zloty to the dollar. Recalculate the profits for Asahi Beverages. Have the profits declined or increased?

(c) Suppose Poland and the Czech Republic have a free-trade agreement. Following the zloty's devaluation, Asahi Beverages can decide to relocate its sales between Poland and Czech Republic to maintain the same level of dollar profits as in part (a). What amount of relocation of sales will give them the original level of profits (assume that the total sales volume is unchanged at 1m cans of Solo and the local prices and costs of production are unchanged)? Explain clearly.

(d) Alternatively, Asahi can try to negotiate the lowering of wages of their Polish workers. What should the new cost of production be to maintain the level of profits in part (a) and given no change in the relocation of sales. All other information stays the same.

(e) Compare the two options in (c) and (d) and comment on which one is more feasible, and the possible obstacles Asahi could face to implementing them.

15 PART B

The iTunes store, owned by Apple Inc. sells songs, movies and tv shows. These stores operate in several countries and the songs are priced in local currency terms.

	iTunes Song Price (Local currency)	PPP exchange Rate	Current US$ exchange rate	Over (+)/under (-) valuation **(iTunes)**	Over (+)/under (-) valuation **(Big Mac)***
USA	US$ 0.99	-	-	-	-
Australia	A$1.69	A$1.70	A$1.33	+28%	-21%
Canada	C$0.99	C$1	C$1.12	-11%	+1%
Japan	¥200	¥202	¥112	+80%	-28%
UK	£0.79	£0.79	£0.53	+51%	+18%

What factor(s) could potentially explain the different prices charged for songs on iTunes? What advantage does the iTunes index have over the Big Mac index?