Practice questions: Set #5

What should you do with this set?

To help students prepare for the exam and the case, seven problem sets with solutions shall be handed out. They shall not be graded: the number of “points” for a question merely indicates the amount of time that I expect well-prepared students to spend answering that question.

Students are strongly encouraged to try hard to solve them and to use office hours to discuss any problems they may have doing so. The best self-test for a student of his or her command of the material before the final exam is whether he or she can handle the questions of the relevant homework's. To reflect this close association between practice sets and exams, the final exam shall include at least a part of a question from the relevant practice sets.

Question 1. (10 points; NOT exam material)

Suppose that you work for a firm whose sales to Germany account for about 50% of its total revenues. Your company is being solicited by two FX-forecasting companies, Wenomor and Noyudont, to subscribe to their weekly newsletter. As an assistant to the CFO, you are asked to evaluate both of those companies' claim that they can be useful to your firm. You remember from your international finance class that forecasters are usually poor in terms of mean absolute prediction error, i.e., they routinely perform "worse than the market" according to this criterion.

a. What is meant by "worse than the market"?

b. You check with the data provided by those two companies and, sure enough, they did on average worse than the market over the last 5 years. The forecasters, though, insist that they should not be judged by the mean absolute prediction error criterion, but instead by how many times their forecasts diverged from the forward rate in the same direction as the actual spot rate did. Wenomor, out of 256 predictions of the future $/€ spot rate, was on the "right side" 165 times. Noyudont was on the right side 130 times. Would you recommend to your boss to subscribe to the newsletter of any of them?

(Hint: if a monkey picked the side, the number of times it would be right out of 256 tries is normally distributed with mean 128 and variance 64).

Question 2. (5 points)

In discussing the European Monetary Union, some European governments have from time to time stressed a need to make the European Central Bank more "accountable to the democratic process". In 2009 and 2010, some members of the U.S. Congress have likewise been pushing for reforms that might make the U.S. Federal Reserve effectively less independent. What could be the likely consequences for price stability and exchange rate stability in the union if either central bank were to become less independent? Explain.
**Question 3. (10 points)**

Thomasville Plastics Corp. has contracted to buy $1.1 million worth of Japanese plastic-injection molding machines. The contract price is set in dollars. Does Thomasville bear any currency risk associated with this purchase? Explain briefly.

(Hint: part of the answer is obvious, but there is more here than meets the eye -- because such machines are long-lived assets).

**Question 4. (15 points)**

We are in 2002. You have just been hired as a financial adviser to Q8, a Kuwaiti oil company. You know that the company is considering buying a few idle refineries in Europe and expanding its activities from just selling crude oil to refining it and selling the derived products. Further, you are aware that crude is selling at about $18/barrel on the world oil market.

**a.** Suppose that, during an informal meeting, Q8's CEO tells you: "Well, if we buy the flabbiest of those refineries and supply them with one-dollar-a-barrel crude, we can make a profit of $15 per barrel. What do you think?" Explain briefly how, based solely on that information, you would answer him. Assume that all those derived oil products are priced in $ in the world market.

(Hint: use common sense)

**b.** Assume PPP holds. Would your answer change if you could sell derived oil products in the currency of the country where the refineries are located? Explain briefly.
Question 1. (15 points; NOT exam material)

Suppose that you work for a firm whose sales to Germany account for about 50% of its total revenues. Your company is being solicited by 2 FX-forecasting companies, Wenomor and Noyudont, to subscribe to their weekly newsletter. As an assistant to the CFO, you are asked to evaluate both of those companies' claim that they can be useful to your company. You remember from your international finance class that forecasters are usually poor in terms of mean absolute prediction error, i.e., they routinely perform "worse than the market" according to this criterion.

a. What is meant by "worse than the market'"?

Answer.

The "market forecast" of the future spot rate is our old friend, the forward rate. Usually, the realized spot rate will turn out to be different than what the market had predicted. Similarly, the companies' forecasts will not perfectly predict the spot rate realization. One can compare the respective performances of the market and of the companies in predicting the future spot rate, by looking at how far the realized spot rate is from those forecasts. One criterion often used is the MAEC or mean absolute prediction error criterion (i.e., the average of the absolute value of the prediction errors or differences between forecasts and realizations). What is meant here is that, according to this criterion, the market did better than the companies at predicting the future spot rate.

b. You check with the data provided by those two companies and, sure enough, they did on average worse than the market over the last 5 years. The forecasters, though, insist that they should not be judged by the mean absolute prediction error criterion (MAEC), but instead by how many times their forecasts diverged from the forward rate in the same direction as the actual spot rate did. Wenomor, out of 256 predictions of the future $/€ spot rate, was on the "right side" 165 times. Noyudont was on the right side 130 times. Would you recommend to your boss to subscribe to the newsletter of any of them?

(Hint: if a monkey picked the side, the number of times it would be right out of 256 tries is normally distributed with mean 128 and variance 64).

Answer.

On average, the clueless monkey should be on the right side of the spot one time out of two. You should certainly expect the companies to do better than the monkey. You can check whether their performance was statistically significantly better by remembering from your stats course that only 35% of the world's monkeys would do worse than 120 correct-side predictions or better than 136, but that only 5% of the monkeys would do worse than 112 correct-side predictions or better than 144.
Put differently, Noyudont is not statistically different from a bunch of monkeys in suits, at least as far as their predictive power is concerned. On the other hand, based on its historical performance, Wenomor almost certainly was not created by a zoo. Does this mean you should forget about Noyudont and recommend subscribing to the Wenomor newsletter?

The answer is that historical performance does not tell much about future performance: Wenomor may have had a string of lucky guesses. Further, it is not true that just being "on the right side" is all that matters: if Wenomor is close to the true spot when it guesses on the right side but far off when it guesses wrong, your company will lose a lot of money by following its advice. The bottom line is this: you don't have enough information here to answer the question. However, given that the MAEC criterion was not favorable to Wenomor, one can anticipate that their services would be useless, at best.

**Question 2. (5 points)**

In discussing the European Monetary Union, some European governments have from time to time stressed a need to make the European Central Bank more "accountable to the democratic process". In 2009 and 2010, some members of the U.S. Congress have likewise been pushing for reforms that might make the U.S. Federal Reserve effectively less independent. What could be the likely consequences for price stability and exchange rate stability in the union if either central bank were to become less independent? Explain.

**Answer.**

The independent European Central Bank (ECB) that has replaced the central banks of the member countries appears to have had price stability as its foremost objective.

To make the ECB "accountable to the democratic process" would mean the imposition of some political control on its actions. However, the most effective central banks are arguably those that can say "no" to politicians: maintaining price stability can be painful in the short term, as the 1981-82 U.S. recession plainly showed, and it is unlikely that many politician would be willing to bear the responsibility for that pain. This means that, with price stability in the hands of politicians through their control of the ECB, the control of inflation would be relaxed. As a result, inflation would likely increase and certainly become less predictable, which would adversely affect exchange rates stability.
Question 3. (10 points)

Thomasville Plastics Corp., a Peoria-based company, has contracted to buy $1.1 million worth of Japanese plastic-injection molding machines. The contract price is set in dollars. Does Thomasville bear any currency risk associated with this purchase? Explain briefly.

(Hint: part of the answer is obvious, but there is more here than meets the eye: machines are long-lived assets).

Answer.

Thomasville Plastic Corp. (TPC) has eliminated the exposure linked to this particular purchase. To see why, notice that TPC is a US company, and as such is interested in knowing for sure the quantity, quality, and dollar price of the goods it is buying. All those are known with certainty in this case. It is irrelevant that the ¥ might depreciate against the $ and that TPC might have made a better buy 1 month from now: it has now fixed all the variables that are of interest to the company, and so faces no risk. (*)

Now for the less-obvious part. There is a FX-risk here, but not on the purchase itself. Expenses associated with the acquisition of a machine do not stop at the purchase. In particular, machines need to be maintained, upgraded, and finally discarded or re-sold on the second-hand market. If spare parts and replacement machines must be obtained from a foreign supplier, then the changes in ¥/$ FX-rate will affect TPC’s operating costs. Similarly, the resale value of a machine is often determined by the going price for new equipment at the resale time, which will also depend on the ¥/$ FX-rate. The bottom line is that TPC does face FX-risk because of the consequences of a particular action -- purchasing a machine, which has cash-flow implications for years to come.

(*) To convince yourself, think about the following two examples. If a company buys ¥ forward to hedge a cash outflow in ¥, it gives up the potential gains associated with a depreciation of the ¥. This is the price to pay for hedging all the foreign exchange risk associated with that ¥ outflow, i.e., with the risk of the ¥ going up or down. Even though at maturity the company implicitly makes a gain or loss on the forward contract, this does not imply that the company faces risks: to the contrary, this implicit gain or loss exactly compensates the loss/gain made on the initial short ¥ position. This is exactly what is going on here.

Similarly, think not of foreign exchange but of the stock market. Suppose there is no inflation. If you deposit money at the bank on a CD, you know for sure what the interest rate is going to be. On the other hand, if you invest in the stock market, you do not know beforehand what the rate of return on your investment is going to be. The CD is called riskless, and the stock market is called risky, for that reason. After the CD matures, should you look back and say: "boy, I could have made 10% on the stock market rather than 5% on the CD, so in fact I was facing risk on the CD too"? Of course not. The only thing that matters is that you got the 5% that were promised to you.
**Question 4. (15 points)**

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a. Suppose that, during an informal meeting, Q8’s CEO tells you: "Well, if we buy the flabbiest of those refineries and supply them with one-dollar-a-barrel crude, we can make a profit of $15 per barrel. What do you think?" Explain briefly how, based solely on that information, you would answer him. Assume that all those derived oil products are priced in $ in the world market. (Hint: use common sense)

**Answer.**

According to the data above, in order to make a profit of $15 per barrel, Q8 would have to sell crude at $1 to its refining subsidiaries. Yet, on the market, the same crude fetches $18. To assess the profitability of a project, Q8 should price internal input transfers at their market value. If it did so, Q8 would realize that the $15 profit is in fact a $2 loss: the company would be better off selling crude, or looking at refineries that are more profitable to operate.

b. Assume PPP holds. Would your answer change if you could sell derived oil products in the currency of the country where the refineries are located? Explain briefly.

**Answer.**

Your answer should not change. As long as PPP holds, there is no comparative advantage to selling products in any particular currency rather than another, and the reasoning made in part a. holds.