SIMON FRASER UNIVERSITY
Department of Economics

Econ 345 — Prof. Kasa
International Finance — Fall 2024

PROBLEM SET 1
(Solutions)

1. (25 points). Suppose the 12-month forward price of the US dollar in terms of the Mexican peso is 20 pesos per dollar. Suppose the spot price of the dollar in terms of peso is 21. Next, suppose that currently the annual interest rate on dollar deposits is 8%, while the interest rate on a comparable peso deposit is 5%. There are no transactions costs. Is there an arbitrage opportunity here? If so, explain exactly how you would take advantage of this situation to make riskless profits.

   *Since the exchange rates are quoted as pesos/dollar (ie, the price of the dollar in terms of pesos), to be consistent with the notation in class, we should regard Mexico as the 'domestic' country and the USA as the 'foreign' country. Covered Interest Parity implies*

$$\frac{F}{E}(1+R^*) = 1+R$$

   *The right-hand side is the peso return on a peso investment, while the left-hand side is the (covered) peso return on a dollar investment. Substituting in the given information, we get*

$$\frac{F}{E}(1+R^*) = \frac{20}{21}1.08 = 1.029 < 1+R = 1.05$$

   *Hence, even though the dollar interest rate is higher, the covered rate of return from investing in the dollar is lower than the return from investing in pesos. You can make arbitrage profits by borrowing dollars, then buying pesos spot, investing in pesos, and then simultaneously selling the (known) amount of future pesos forward. You will have more than enough dollars to pay back your dollar loan. Your profits are only limited by by how many dollars you can borrow! In practice, this would be implemented with a swap contract.*

2. (25 points). On Sept. 4, 2024 an article entitled "Want to Make a 30% Return with Little Risk? Just Buy Japanese Short-Term Bonds" was published in the *Globe and Mail*. It contains the following passage:

   > *If you are looking at what could be the most glaring price anomaly on the planet, it is the Japanese yen. It hit its worst level in over three decades in July at 161 yen and has since moved to 145 yen, and this story is not over yet....The currency has absolutely no reason to be as low as 145 yen. The central bank is bucking the global trend by raising rates and pledging to continue doing so...The yen, as with most currencies that freely float, reverts to the mean. In this case, the long-run mean is 113 yen, which means there is more than 20% left in the tank as far as yen*

*appreciation potential is concerned...A likely 40% appreciation is totally consistent with The Economist's Big Mac index, which shows the Japanese yen at the current time to be undervalued by 44%...Let's split the difference between the mean and the Big Mac index and what it says is that for you to earn 30% for your clients (or yourself) in the coming year, all you need to do is ride the tailwind of the unwind of the yen bear market – a 30% potential return here without taking on equity risk... who cares if the yield is only 0.3%, you're not embarking on this strategy for interest income, but for the vast currency appreciation.*

**(a)** Use the graph of foreign exchange market equilibrium developed in class to illustrate why the yen is predicted to appreciate if the Bank of Japan raises interest rates.

*This is straight from the notes. See Lecture 3A (Part A), p. 12. The only difference is that the plot in the notes depicts a monetary expansion (lower R) rather than a monetary tightening (higher R).*

**(b)** This article claims to be able to predict the future value of the yen. Does this mean the market is inefficient? According to some people (eg., Eugene Fama), you shouldn't be able to predict changes in asset prices, ie, they follow a 'random walk'. Is that the case here?

*Uncovered Interest Parity does <u>not</u> imply exchange rates follow random walks. Exchange rate changes should be predictable if there are differences in interest rates across countries.*

**(c)** The current 1-year Tbill rate in the USA is about 3.9%. As the article notes, the current 1-year rate in Japan is about 0.3%. According to Uncovered Interest Parity, is the market expecting the yen to appreciate or depreciate? By how much?

*Following up on the answer to part (b), note that UIP is in fact predicting that the yen will appreciate over the next year. Since the US interest rate is 3.9% while the Japanese interest rate is only 0.3%, UIP implies 'the market' is predicting a 3.6% depreciation of the dollar (or equivalently, a 3.6% appreciation of the yen). Note, however, that this is much less than the author of the article is predicting! He bases his prediction on a return to PPP, but we know from class that PPP might not hold (even in the long-run), if there are changes in the real exchange rate.*