

ECON 1550

Spring 2026

Problem Set 6

Due: March 18, 2026 at 11:59pm ET

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Submission: [Canvas](#) or [Gradescope](#)

Instructions

- When submitting to Gradescope, indicate the page where each question is answered to avoid a 5-point deduction.
- Full credit is given for correct answers. If multiple steps are needed, you must show them to get full credit.
- Points are shown for each part. Partial credit is given for partially correct answers; show your work to maximize it.
- Late submissions receive a score of zero.
- If you have technical problems submitting, email your work to the Head TA before the deadline.
- Collaboration with classmates is encouraged; use of generative AI is permitted but discouraged.
- You must write, understand, and submit your solutions individually. Copying other students' or AI-generated answers, even fragments, is not allowed.

1. A Conditional Carry Trade (40 points)

(a) [8 points] Consider the price level in the United States at time t , $P_{US,t}$, the price level in Korea at time t , $P_{Korea,t}$, and the U.S. Dollar (USD) per Korean Won (KRW) exchange rate at time t , E_t . Write the equation for relative PPP between the United States and Korea.

(b) [8 points] When

$$\frac{P_{US,t}}{P_{Korea,t}} - E_t > 0,$$

the theory of absolute PPP suggests that USD is overvalued compared to KRW. Write an analogous condition that suggests that USD is overvalued compared to KRW according to *relative* PPP.

(c) [8 points] Download the [inflation rate for the United States](#) and the [inflation rate for Korea](#) from FRED for all months between February 2009 and July 2023 and show

both series in a single plot that has time on the horizontal axis and the inflation rates on the vertical axis.

Hint: The links should already display the correct dates, but double check and adjust them if needed. Likewise, the link should already show the consumer price index in units of “Growth rate same period previous year”, but make sure it is the case before downloading.

- (d) [8 points] Combine the data from (c) with the carry trade data you constructed in Problem Set 3, question 2, part (c), and compute the relative PPP overvaluation condition from part (b). Now construct an indicator variable that is equal to 1 when the overvaluation condition is true, and equal to zero otherwise. Plot this indicator variable with time on the horizontal axis and the indicator on the vertical axis.

The *hedged carry trade* is a trading strategy where, for each month, you check if the relative PPP overvaluation condition you constructed in (d) signals an overvalued USD. If the signal is for an overvalued USD, invest nothing for that month and earn a monthly return of zero. If the signal is not for an overvalued USD, invest in the standard carry trade and earn the same monthly return that you computed in Problem Set 3, question 2c.

- (e) [8 points] Show the cumulative returns for the hedged carry trade and the standard carry trade together in one plot, with time on the horizontal axis and the cumulative returns on the vertical axis.

By the end of the sample, which strategy has higher cumulative returns? Is the difference in cumulative returns between the two strategies evidence in favor or against the idea that relative PPP holds in the long run?

2. Long-Run Theories of the Exchange Rate Determination (60 points)

Consider the model of the long run given by:

$(PPP) :$	$E = P/P^*$
$(MS = MD) :$	$M^s/P = L(R, Y)$
$(MS^* = MD^*) :$	$M^{s^*}/P^* = L(R^*, Y^*)$

In class, we referred to this model as “Model 1”.

- (a) [12 points] Explain the name of the equations PPP , $MS = MD$, and $MS^* = MD^*$.
- (b) [12 points] Identify the exogenous and endogenous variables.

Hint: Consult [these slides](#) if you need a reminder.

- (c) [12 points] Assume that the function $L(\cdot, \cdot)$ is given by $L(R, Y) = Y/R$ and $L(R^*, Y^*) = Y^*/R^*$. Solve for the endogenous variables as a function of the exogenous variables.
- (d) [12 points] Consider a one-time permanent increase in M^s . Explain how all endogenous variables respond immediately when the change in M^s occurs and in the long run.

To the above monetary model, we add the following equations:

Relative output demand:	$Y/Y^* = q$
Relative output supply:	$Y/Y^* = \bar{Y}$
Definition of real exchange rate:	$q \equiv EP^*/P$

The exogenous variables are the same as before and, in addition, \bar{Y} . Assume $\bar{Y} = 1$. The endogenous variables are the same as before and, in addition, q and Y/Y^* .

The first equation, labeled Relative output demand, is a behavioral equation that captures the idea that if domestic goods become cheaper relative to foreign goods (q goes up, a real depreciation), then demand for domestic goods will increase relative to demand for foreign goods (the "relative output demand" Y/Y^* goes up).

The second equation, labeled Relative output supply, says that the relative supply of domestic and foreign goods, Y/Y^* , is equal to an exogenous variable \bar{Y} .

The third equation is the definition of the real exchange rate q .

In equilibrium, relative output supply must equal relative output demand.

- (e) [12 points] Consider a one-time permanent increase in M^s . Explain how all endogenous variables respond to the change in M^s in the short run (immediately after the change in M^s) and in the long run.

Hint: If you need help understanding the model, Section 5.6 of Chapter 5 of the textbook has a longer discussion.