SECTION 6
February 20, 2003

- **Law of One Price**

   Assume transport costs and distributional costs are zero. LOP states that for any good j,
   $$\$p(j) = E\, p(j)^* .$$

- **Purchasing Power Parity (PPP)**

   (i)   Absolute PPP

   $$\$P = E\, P^*$$

   Empirics say the absolute PPP does not hold.

   (ii)   Relative PPP

   $$\pi = e + \pi^*$$

   The relative PPP can hold even if the absolute PPP does not hold.

- **Exchange Rates and Terms-of-Trade**

   Assume that good prices are denominated in producers' currency. Terms-of-trade is defined as the relative price of exports in terms of imports.

   $$ToT = P_{ex} / E\, P_{im}^*$$

   → Appreciation (depreciation) improves (worsen) terms-of-trade.

- **Real Exchange Rates**

   (i)   Relative Exchange Rate

   Relative price level of one country, evaluated using a basket of goods and services of another country. (Bilateral rate)

   $$q = P / EP^*$$

   → $q = 1$ if the absolute PPP holds.

   (ii)   Real Effective Exchange Rate

   Relative price level of one country, evaluated using baskets of goods and services of several major trading partners. (Multilateral rate)

- **Interest Parity**

   Assume that "risk" and "liquidity" features across assets are identical. In other words, all assets are perfect substitutes. Then what determines demand for all assets is only their expected rate of returns.

   (i)   Uncovered Interest Parity (UIP)

   $i - i^* =$ rate of depreciation of home currency

   (ii)   Covered Interest Parity (CIP)

   $i - i^* =$ forward discount on home currency

Example: Japanese Yen and Canadian Dollar

Today (as of 3pm) 3-month Japanese government bond yield is 0.004 percent.
Today 3-month Canadian government bond yield is 2.811 percent.
Today Canadian\$/US\$ spot rate is 1.5054.
Today Yen/US\$ spot rate is 118.3550.
Suppose 3-month Canadian\$/US\$ forward rate is 1.2032.
Calculate 3-month Yen/US\$ forward rate.

→ From CIP, 3-month forward discount for Japanese Yen
     = 0.004 – 2.811
     = -2.807 percent
→ Compute the cross rate for Yen and Canadian\$.
     Today Yen/Canadian\$ spot rate
     = (Yen/US\$)/(Canadian\$/US\$)
     = 118.3550/1.5054
     = 76.6203
→ By the definition of "forward discount," -2.807 percent discount implies that,
3-month Yen/Canadian\$ forward rate
     = (1-0.02807) (Yen/Canadian\$ spot rate)
     = (1-0.02807) 76.6203
     = 76.4134
→ 3-month Yen/US\$ forward rate
     = (3-month Yen/Canadian\$ forward rate) x
      (3-month Canadian\$/US\$ forward rate)
     = (76.4134)(1.2032)
     = 91.9406