

Forward Exchange Rate Calculation

1 Question

Suppose the following:

1. today is September 17, 2025
2. the current spot USD/CAD FX rate $USD/CAD = 1.40$ (i.e. 1.40 CAD per 1 USD)
3. the Government of Canada 1-year bond maturing on September 17, 2026, has a coupon of 3.50% and a yield to maturity of 2.50%
4. the day count convention for pricing Government of Canada bonds is Actual/365
5. the US Treasury 1-year bond maturing on September 17, 2026, has a coupon of 3.75% and a yield to maturity of 4.00%
6. the day count convention for pricing US Treasury bonds is Actual/Actual
7. assume both bonds pay interest annually on September 17, 2026.

Calculate both the forward USD/CAD and CAD/USD FX rates on September 17, 2026, rounding to 2 decimal points.

2 Answer

- **Step 1:** by interest rate parity for calculating forward FX rates at time T the following must hold:

$$(1 + r_{USD})^T = USD/CAD_{spot} \times (1 + r_{CAD})^T \times CAD/USD_T$$

- **Step 2:** the forward FX rate CAD/USD_1 can therefore be solved as:

$$CAD/USD_1 = \frac{(1+r_{USD})^1}{(1+r_{CAD})^1 \times USD/CAD_{spot}} = \frac{(1+0.04)^1}{(1+0.025)^1 \times 1.40} = 0.72473868$$

- **Step 3:** the forward FX rate USD/CAD_1 can therefore be solved as:

$$USD/CAD_1 = \frac{1}{CAD/USD_1} = \frac{1}{0.72473868} = 1.37980769$$

- **Step 4:** rounding to 2 decimal points gives $USD/CAD_1 = 1.38$ and $CAD/USD_1 = 0.72$