

Chapter 6

International Trade and Exchange Rate Volatility

Thus far, we have focused our analysis on price risk. This price risk manifests itself in the form of variability in output and/or input prices. We have also evaluated ways in which to mitigate price risk through the use of futures and options contracts. However, now we assume an open economy that trades. When a business sells domestically, there is a single transaction between the buyer and seller and an agreed upon price. When a business sells internationally, there are two transactions:

1. A foreign buyer pays for the good or service at the agreed upon price in foreign currency
2. The foreign currency is traded or exchanged for U.S. dollars and the agreed upon price

Given that there are now two steps to consider, the complexity has increased. We start this new section with a review of exchange rates.

6.1 The Basics

Why do we have exchange rates?

- Because we like to trade
- Because we need to know exchange currencies sometimes (traveling...)
- Why don't we just make a single currency?
 - Why did the EU create a single currency?
 - * Makes trade easier within the EU countries
 - * Minimizes price variability in trade within countries
 - * Exchange rate volatility negatively impacts terms of trade (especially developing countries) - imagine ranching in Argentina.

What influences exchange rates?

- Supply of currency (monetary policy, Imports & Exports)
- Demand for currency
 - foreign investments
 - interest rates (eg, low relative US interest rate discourages foreign investments)
 - inflation (discourages foreign investment)

What other issues impact international trade?

- In general, free trade improves the welfare of all trading countries (remember comparative advantage)
- Free trade agreements
 - Why do so many countries want to join the EU?

- How do countries join the EU?
- Why is the US recent trade agreement with N. Korea important to beef sector?
- The importance of NAFTA?
- What about the Carribean Trade Agreement (Caricom) - impact of developing countries joining a trade agreement

6.2 Some Examples

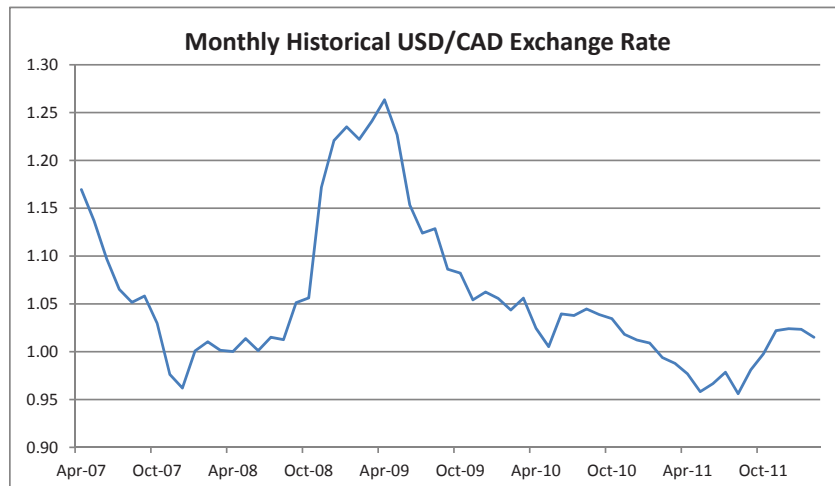
If you travel, you'll be able to buy the following amounts with 1 USD:

- 80 Yen (Japan)
- 0.75 Euro (EU)
- 12.78 Pesos (Mexico)
- 0.9968 Canadian Dollars
- 7.568 Namibian Dollars
- 0.9338 Australian Dollars
- 1.71 Brazilian Reals
- 6.29 Chinese Remnibi
- How do changes in these rates impact what you can buy in these countries?
 - If USD can buy more foreign currency, stuff overseas becomes cheaper for us to buy
 - US stuff becomes more expensive for foreigners to buy
- How do exchange rates impact agricultural trade?

- If USD becomes weaker (stronger), relative to other currencies
 - * US goods become less (more) expensive overseas...increases (decreases) US exports
 - * Foreign goods become more (less) expensive in the US...decreases (increases) US imports

6.2.1 Feeder Calves from Canada Example

Assume a buyer in Montana is interested in purchasing feeder calves from Manitoba, Canada. The current exchange rate is 0.9948 USD/CAD, meaning 1.0000 USD is equivalent to 0.9948 CAD. Below see a chart of recent chart of monthly exchange rates between the US and Canada.



source: Oanda.com

Assume the buyer in Montana agrees to buy the pen of feeder calves for 1.50 per pound (in Canadian Dollars) in 3 months. The anticipated weight is on average 500 pounds for 20 animals. Let's assume that this estimated weight

is right on. The buyer has already settled on a forward contract, but it is in terms of Canadian Dollars. Assume the buyer is concerned that the USD might weaken, relative to the CAD. How might the buyer hedge this exchange rate risk?

- The buyer might agree to the terms in USD, rather than CAD
 - This is essentially a forward contract on exchange rates
- The buyer might use a CAD/USD futures or options contract

To evaluate these options, first assume that the buyer does not hedge. The current CAD/USD rate is the inverse of the USD/CAD rate, so that the CAD/USD rate is 1.0052. This implies that 1 CAD is needed to obtain 1.0052 USD. If the exchange rate does not move at all, the buyer would need to come up with 14,922 USD [= $(500 * 20 * 1.5) * 1.0052 = 14,922$] in order to pay for the feeder calves. However, if the USD weakens, relative to the CAD, the rate CAD/USD rate might increase to 1.1000, implying that only 100 CADs are needed for 110 USDs. If this were to happen, the buyer would need to come up with 16,500 USD at the time of sale. See below for a table relating other prices.

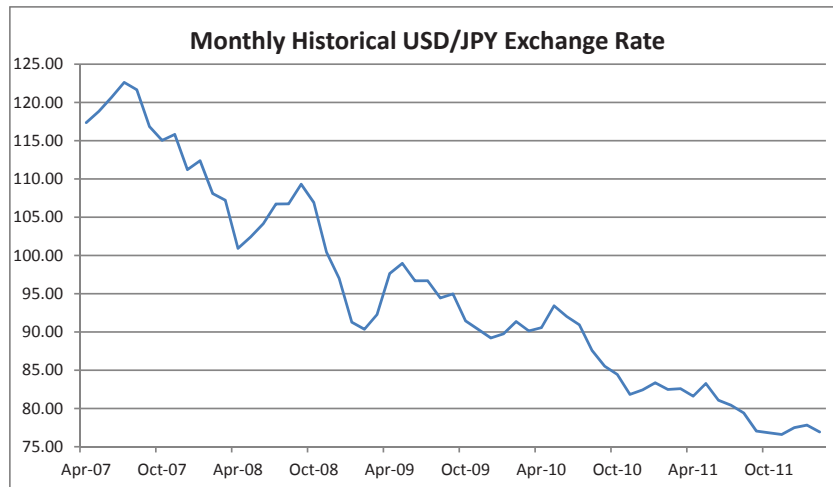
Movement	CAD/USD	Cost (in USD)
USD Weak	1.2000	18,000
	1.1000	16,500
No Change	1.0052	15,078
	0.9000	13,500
USD Strong	0.8000	12,000

Based on this table, the buyer has adverse risk with the rate moves up, or the dollar weakens relative to the CAD. This is because Canadian products are now more expensive to buy in the US. To offset this risk, the buyer could either purchase a short futures contract or buy a call option. While the futures contract from the CME contains 100,000 CAD and might be too large for the

buyer, an E-micro CAD/USD futures product is available with a size of 10,000 CAD. The buyer can purchase a long futures E-micro contract from the CME that expires in June and hedge the exchange rate risk.

6.2.2 Wheat Exporting Example

Assume a buyer in Japan is interested in purchasing wheat from a spring wheat producer in Montana. The USD/JPY rate is currently 80.84, meaning 1 USD is worth 80.84 JPY. Remember, this implies that the JPY/USD rate is 0.01237 [= $1/80.84$]. (Note: This is important because the CME futures price is quoted with this rate.) Assume the Japanese buyer is interested in purchasing 23,000 bushels of wheat for 565.88 Yen per bushel. Given the exchange rate above, what does this assume wheat is being sold for in the US? [= $565.88/80.84 = 7.00$]. Below is a plot of historical USD/JPY rates.



source: Oanda.com

What is the implied current cost from this contract in USD and JPY?

[$JPY = 565.88 \text{ per bushel} \times 23,000 \text{ bushels} = 13,015,240$] and [$USD = 13,015,240 / 80.84 = 161,000$].

If the exchange rate changes to 60, 70, 90, or 100, what is the implied cost in USD?

Movement	USD/JPY	Cost (in USD)	Hedged Cost (in USD)
USD Weak	60	216,921	165,541
	70	185,932	165,541
No Change	80.84	161,000	163,850
	90	144,614	147,464
USD Strong	100	130,152	133,002

Based on the table, the seller in the US is adversely impacted if the exchange rate drops. Therefore, it might be appropriate to take out a call on a JPY/USD option. Assume a call is taken out with $K = 12500$, which effectively sets the trigger when the USD/JPY decreases below 80. What are the returns given the possible prices in the given table if the premium is 2,850 USD?