

CHAPTER 15

Smart *Excel* Appendix

Appendix Contents

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If function

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Use the Smart *Excel* spreadsheets and animated tutorials at the Smart Finance section of <http://www.cengage.co.uk/megginson>.

EXCEL PREREQUISITES

You need to be familiar with the *Excel* IF function to use this appendix.

If this is new to you be sure to complete the **Excel Prereqs** tab in the Chapter 15 *Excel* file located at the Smart Finance Web site before proceeding.

FORWARD PREMIUM OR DISCOUNT

Problem: Solve Problem 15-5 in the text. Supply the forward yen premium or discount (specify which it is) for the given one- and three-month quotes as an annual percentage rate.

Approach: Create a simple model to find the forward premium or discount

Try it yourself in a blank *Excel* file. Think about what to include in the input section and how to set up your calculations and output.

Or, Open the Chapter 15 *Excel* file located at the Smart Finance Web site. Turn to the **ForwPrem** tab.

Enter the input information from Problem 15-5.

The forward premium or discount on a currency is:

$$= (F - S) / S$$

This must then be annualized.

Apply it

Find the forward premium.

To annualize the one-month premium, multiply by 12. To annualize the three-month premium, multiply by 12/3, or 4.

Your results should match:

Annualized 1-month forward premium	1.91%
Annualized 3-month forward premium	1.96%

PURCHASING POWER PARITY

The law of one price states that identical goods trading in different markets should sell at the same price, absent any barriers to trade.

Law of one price holds if $P_{for} / P_{dom} = S_{for/dom}$

This concept is applied in Problem 15-7.

Problem: Solve Problem 15-7 in the text. A particular commodity sells for \$5,000 in the United States and ¥600,000 in Japan. Assume the current spot rate is ¥109.43 per euro.

Approach: Create a model to analyze purchasing power parity.

Open the Chapter 15 Excel file located at the Smart Finance Web site. Turn to the PPP tab.

Apply it

- **Solve Part (a): Does the law of one price hold?**

Fill in the inputs. Then compare the cost in Japan to the cost in the United States. To do so, translate the cost in the United States into yen.

The cost in yen in the United States equals the cost in euros multiplied by the spot rate. You should get ¥547,150 in the United States compared with ¥600,000 in Japan. Since the two are not equal, the law of one price does not hold.

Option: Use an IF statement to answer Part (a).

You can set up an IF statement that returns **Yes** if the law of one price holds and **No** if it does not.

- **Solve Part (b): Is arbitrage possible if shipping costs are ¥60,000? At what exchange rate (in yen per euro) would buying the commodity in the United States and shipping to Japan become profitable?**

To solve this, first include shipping costs. Simply add the ¥60,000 yen shipping cost to the cost of ¥547,150. The result is ¥607,150. Arbitrage is NOT possible because this exceeds the cost in Japan of ¥600,000.

Again, you can use an IF statement to answer this question. Compare the cost including shipping with the cost in Japan.

Now find the exchange rate at which buying the commodity in the United States and shipping to Japan becomes profitable.

Buying in the United States and shipping to Japan becomes profitable when the cost in the United States (in yen) plus the ¥60,000 cost of shipping is less than the Japanese cost of ¥600,000.

Or, find the exchange rate that solves:

$$\$5,000 + ¥60,000 < ¥600,000$$

$$¥/\$ \text{ such that } \$5,000 < ¥540,000$$

$$¥/\$ < 108.00$$

If the current exchange rate fell to below 108.00, arbitrage becomes possible.

In the model you can easily find this:

$$= (\text{Price in Japan} - \text{Shipping costs}) / \text{Price in } \$$$

- **Solve Part (c): At what exchange rate (in yen per euro) would buying the commodity in Japan and shipping to the United States become profitable?**

Buying in Japan and shipping to the United States becomes profitable when the cost in Japan, including the ¥60,000 cost of shipping, is less than the United States cost of \$5,000.

Or, find the exchange rate that solves:

$$\$5,000 > ¥600,000 + ¥60,000$$

$$¥/\$ \text{ such that } \$5,000 > ¥660,000$$

¥/\$ > 132.00

If the current exchange rate rises above 132.00, arbitrage becomes possible.

In the model you can easily find this:

= (Price in Japan + Shipping costs) / Price in \$

- **Solve Part (d): At what exchange rate does the law of one price hold?**

At the rate = Price in yen / Price in euros

= 120.00

Your model results should match:

Inputs

Price in ¥	600,000.00
Price in \$	5,000.00
Spot rate ¥/\$	109.43
Shipping costs—¥	600,000.00

Calculations

US Cost in ¥	547,150.00
Cost with shipping	607,150.00

Output

Part (a)	Does law of one price hold?	No
Part (b)	Is arbitrage possible if buy in U.S. and ship to Japan?	No
	To profit by buying in U.S. and shipping to Japan, spot rate must be below:	108.00
Part (c)	To profit by buying in Japan and shipping to U.S., spot rate must be above:	132.00
Part (d)	Spot rate for Law of one price:	120.00

Apply it

- **In this problem, when is arbitrage possible?**

At an exchange rate of ¥120/\$, the price is the same in Japan and the United States. Ignoring shipping costs, arbitrage is therefore possible at rates above or below ¥120/\$. However, arbitrage would involve buying in one country and shipping to another. The cost of shipping is significant. It leads to a band of exchange rates within which arbitrage is impossible. At exchange rates below 108¥/\$, buying in the United States and shipping to Japan leads to profits. At exchange rates above 132¥/\$, buying in Japan and shipping to the United States is profitable. Between 108¥/\$ and 132¥/\$ arbitrage is not possible because any potential gains from differential pricing of the commodity between the two countries is eliminated by the shipping costs.