

Adjustments for Changes in Exchange Rates During an APA Term

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Adjustments for Changes in Exchange Rates During an APA Term^{*}

I. Executive Summary

Foreign exchange (FX) risk is the risk that profits will change if FX rates change. FX risks present complicated transfer pricing issues. What FX risks does the tested party bear? Do the comparable companies bear comparable risks? Did the comparable companies and tested party experience comparable fluctuations in exchange rates during the comparables-testing period? If not, what adjustments are appropriate? This paper focuses on an FX issue that is unique to Advance Pricing Agreements (“APAs”) – how to structure provisions that adjust tested parties’ results when exchange rate changes occur during an APA Term.

Under today’s system of floating FX rates, currencies often move dramatically over short periods. In one two-day period in 1998 the yen/U.S. dollar exchange rate moved nearly 20 percent. Empirical studies demonstrate that FX volatility can significantly affect companies’ profits.

Multinational businesses face several types of FX risk, including financial, translational, transactional and economic FX risk. We focus here on economic risk, also known as operational or competitive FX risk. Economic risk arises, for example, when a multinational business incurs costs in one currency and generates sales in another. Profits may decrease if the cost currency appreciates against the sales currency.

Multinational businesses have tools to reduce economic FX risk. They may use financial instruments to hedge unfavorable FX moves, although doing so entails explicit costs. They also may change their operations to reduce FX risk. For instance, they may change the denomination of cash deposits, restructure contracts, relocate plants, or change the source of capital or production materials. They may share FX risks with related parties or pass the costs or benefits of FX changes through to unrelated customers or suppliers. But even businesses that hedge or optimally structure their operations to reduce FX risk may be disadvantaged if a competitor experiences a favorable FX move.

The Section 482 regulations typically determine a tested party’s arm’s-length compensation based on results for companies engaged in comparable transactions under comparable circumstances. If the tested party’s and the comparable companies’ transactions or circumstances differ materially, and the effect of such differences on prices or profits can be ascertained with sufficient accuracy to improve the reliability of results, adjustments must be made. The tested party and comparable companies may face materially different FX risks and experience, for which adjustments may be appropriate.

^{*} Authored by Advance Pricing Agreement Team Leaders J. Clark Armitage, Per Juvkam-Wold and Robert Weissler and by APA Economists Walter Bottiny, Bryant Brooks, Russell Kwiat and Kurt Regelbrugge.

The first step in comparing the tested party's and comparable companies' FX-related transactions and circumstances is to determine how much FX risk the tested party bears. A multinational business may expressly allocate FX risk to a controlled entity (i.e., the tested party) or the parties may, through their conduct, treat the tested party as sharing in the risk. The tested party is treated as holding such risk only if it has the financial capacity to bear potential FX losses.

After determining how much FX risk the tested party faces, the comparable companies' results may be adjusted for "material differences" between the level of their FX risk and the tested party's FX risk. In addition, adjustments may be appropriate to reverse the comparable companies' gain or loss from FX changes that occur during the relevant testing period. These adjustments produce a set of comparable company results that include no FX gain or loss. This paper does not, however, address whether or how to make these adjustments. Instead, this paper address whether and how to adjust the tested party's results for the impact of FX changes that occur during the APA Term.

We further focus on adjusting a tested party's results for FX experience when the transfer pricing method is the comparable profits method ("CPM") or the residual profit split method ("RPSM"), although similar considerations may apply for other methods. The CPM and RPSM may allocate FX gain or loss in a manner that is inconsistent with the controlled parties' allocation of FX risk. For example, if the CPM requires a 2 to 4 percent operating margin for a tested party, the tested party's operating margin must be within that range even if the tested party's share of the multinational businesses' FX loss would cause a comparable company to incur an overall loss.

When the CPM or RPSM applies, a provision that adjusts for the impact of FX changes should consider the following elements: (1) what foreign currencies are relevant and what inputs or sales are priced in those currencies; (2) what portion of the cost or benefit of an FX change the controlled parties will pass through to uncontrolled parties; (3) how will the controlled parties split the remaining cost or benefit; (4) what FX changes are relevant; and (5) whether the adjustment should be made to the tested party's COGS, gross margin or some other indicator. This paper addresses these elements in detail, but other elements may also be relevant.

In appropriate cases, the APA Program will adjust the results of the CPM or RPSM for profit-altering FX changes. Proposed adjustments should address the elements identified above and other relevant elements. However, the APA Program's view is that these adjustments are unreliable in many cases. In a typical case, it is difficult to estimate the portion, if any, of FX cost or benefit that can and will be passed through to uncontrolled parties. It also is difficult to identify and quantify all opportunities for hedging FX risk. For these and other reasons, the APA Program's view is that, in many cases, adjustment provisions will not increase the reliability of results.

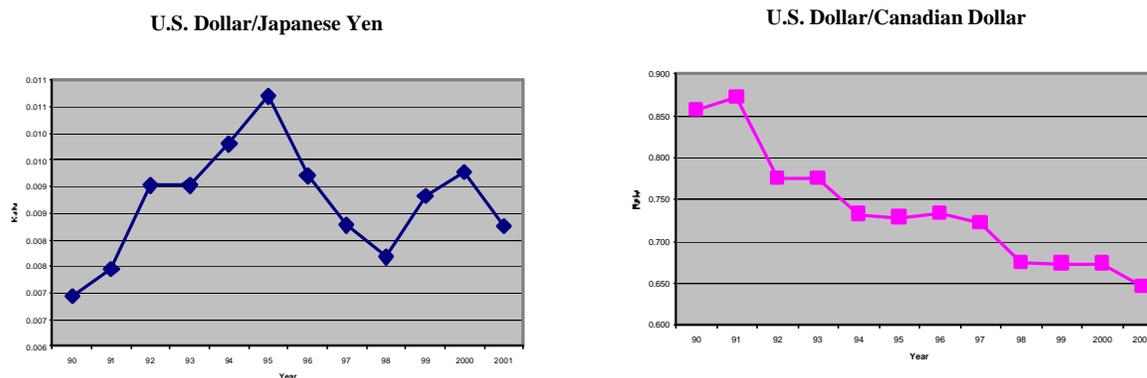
II. Background on FX Risk

A. Volatility of FX Rates

In 1944, the Bretton Woods fixed exchange-rate system was created based on the gold exchange standard.¹ Each national currency was assessed according to its gold value and was freely convertible into gold. Governmental monetary authorities rarely adjusted these fixed FX rates. In the early 1970s, as growing international trade and financial transactions put stress on the gold standard, a series of planned and unexpected events led to the end of U.S. dollar/gold convertibility in 1971 and abandonment of any link to gold's price with a new system of floating currencies in 1976.

The floating-currency system exhibits volatile currency fluctuations. For example, the following charts display U.S. dollar exchange rates with the Japanese yen and the Canadian dollar.

Exhibit 1



Both charts demonstrate significant short-term FX volatility. The yen/U.S. dollar exchange rate has been extremely volatile. In fact, in one two-day period in 1998, the U.S. dollar dropped in value by 20 yen or nearly 20 percent.² Over longer periods of time, however, FX rates reflect underlying macroeconomic fundamentals (see later discussion of purchasing power parity).

The volatility of floating FX rates has a significant impact on the profits of multinational businesses. Most researchers have measured the impact by studying how changes in FX rates affect market capitalization.³ Researchers consistently find that periods of significant FX movements produce substantial changes in stock market capitalization.⁴ Approximately 25 percent of U.S.-based multinational businesses had significant FX exposure between 1995 and

¹ Solnik, Bruno, *International Investments*, 3rd edition, (1996), Addison Wesley, pp. 3-7.

² Cooper, Neil and Talbot, James, *The Yen/Dollar Exchange Rate in 1998: Views from Options Markets*, Bank of England Quarterly Bulletin (February, 1999).

³ Bodnar, Gordon M. and Marston, Richard C., *A Simple Model of Foreign Exchange Exposure*, Wharton/CIBC Survey of Risk Management by U.S. Non-Financial Firms (1998).

⁴ E.g., Dahlquist, Magnus and Robertsson, Goran, *Exchange Rate Exposure, Risk Premia and Firm Characteristics*, at <http://www.sifr.org/PDFs/drfx010419.pdf>; Doidge, Craig, Griffin, John and Williamson, Rohan, *An International Comparison of Exchange Rate Exposure*, at <http://www.msb.georgetown.edu/faculty/williang/International-Exposure.pdf>.

1999.⁵ During that period, the average monthly stock market return of these firms fell 0.68 percent when the dollar appreciated one percent. In crisis periods, characterized by above-average FX changes, the average return fell 2.8 percent.⁶

B. Definition of FX Risk

Companies face four general types of FX risk:

- Financial Risk;
- Translational Risk;
- Transactional or Commitment Risk; and
- Economic, Operational, or Competitive Risk.

This paper focuses primarily on economic risk, also known as operational or competitive risk. Here, we briefly define financial, translational and transactional FX risks, then define, explain and provide examples of economic risk. [Examples of the other categories of risk are attached at Appendix 1.]

1. Financial FX Risk

Financial FX risk arises when a person holds foreign currency as a store of wealth. The value of the foreign currency holdings to the holder's functional-currency⁷ operations will change if the exchange rate between the foreign and functional currencies changes.

2. Translational FX Risk

Translational FX risk typically arises as a result of translating a company's reported financial results from the company's functional currency to other currencies for informational or comparative purposes. The balance sheet reports historical values of assets, liabilities, and equity as of the end of a reporting period. The FX rate at which the currencies trade at the end of the period (*i.e.*, the "spot" rate) likely was not the FX rate in effect when the accounts were booked. Financial statement presentation issues are critical to understanding translational FX risk and we attach a discussion of those principles at Appendix 2.

3. Transactional or Commitment FX Risk

Transactional FX risk arises when a party agrees to purchase or sell goods at a specified foreign currency price on one day, but does not actually make or receive payment until a later date. If the FX changes during the intervening period, the price of the sale or purchase in functional

⁵ Ihrig, Jane, *Exchange-Rate Exposure of Multinationals: Focusing on Exchange-Rate Issues*, Board of Governors of the Federal Reserve System, International Finance Discussion Paper No. 709 (Aug., 2001).

⁶ Ibid.

⁷ The Internal Revenue Code of 1986, as amended, defines "functional currency" as the U.S. dollar or, in some cases, the currency of the economic environment in which significant parts of the tested party's activities are conducted and in which the tested party keeps its books and records. § 985. For purposes of this paper, we use "functional currency" to identify the currency in which the tested party measures its results.

currency changes. Commitment FX risk arises when a business agrees to make unspecified future purchases or sales at specified foreign-currency prices.

4. Economic, Operational, or Competitive FX Risk

Economic risk, also known as operational or competitive FX risk, arises when changes in FX rates alter the competitive position of a business. This typically occurs when the business generates sales in one currency and incurs costs in another.

But economic FX risk can arise even if a business operates in a single currency. For example, assume that Acme Inc., which manufactures and distributes products in the United States, faces competition in the U.S. market from Japanese manufacturers who sell through unrelated distributors. The distributors pay yen prices that are fixed for six months. If the dollar appreciates against the yen, the U.S. distributors need fewer dollars to meet their yen obligations and will experience increased gross margins on sales of the Japanese manufacturers' products. Further, the distributors of Japanese products likely will not be satisfied with higher per-unit gross margins. They likely will increase their total gross profit (and sacrifice some of their higher gross margin) by lowering prices and taking quantity market share from Acme. Acme must reduce its prices if its products likely will be less competitive. In the end, Acme likely will lose sales because its costs are in dollars instead of yen.

In sum, economic FX risk could affect Acme's competitive position in the following ways:

- Initial loss of sales as lower-priced Japanese products enter the market;
- Reduced gross margins after reducing prices to compete with the Japanese products; and
- Further loss of sales if Acme's cost structure prevents it from matching prices for the Japanese products.⁸

Providing an example of economic risk is easier than calculating its effects. Ultimately, multiple parties, such as a foreign manufacturer, its competitors, its suppliers, its U.S. wholesale distributor, its U.S. retail distributor, and the U.S. consumers, may share the cost or benefit of FX changes. The extent to which each group shares the cost or benefits of a currency shift depends on the pricing strategies at each level of trade and on the elasticity of demand with respect to price.

Price elasticity of demand is the proportionate change in demand given a change in price. If a ten-percent drop in the price of a product produces a five-percent increase in demand for the product, the price elasticity of demand is 0.5. (Technically, the elasticity is -.5, but elasticity coefficients are generally presented as positive numbers.) For most consumer goods and services, price elasticity tends to be between 0.5 and 1.5.⁹ Products with price elasticity greater than one are "elastic", while products with price elasticity less than one are "inelastic."

⁸ A reduction in both Acme's and its competitors' prices should lead to an overall expansion in the quantity size of the U.S. market. While the expansion would tend to increase Acme's total sales, this effect may be more than offset if customers can easily switch from Acme's products to functionally similar products of Acme's competitors.

⁹ *Price Elasticity of Demand*, Mackinac Center for Public Research, at <http://www.mackinac.org/1247>.

Factors affecting elasticity include:

- Availability of substitutes: the more substitutes, the greater the elasticity.
- Degree of necessity or luxury: luxury products tend to have greater elasticity.
- Proportion of the purchaser's budget consumed by the item: products that consume a large portion of the purchaser's budget tend to have greater elasticity.
- Time period considered for measuring demand after a permanent price change: elasticity is greater over longer periods because consumers have time to adjust their behavior.
- Permanent or temporary price change: a one-day sale may elicit a greater initial response than a permanent price decrease. Thus, perceptions of permanence are important as well.
- Price points: decreasing the price from \$2.00 to \$1.99 may elicit a greater response than decreasing it from \$1.99 to \$1.98.

The price elasticity estimates presented in Exhibit 2 illustrate the impact of some of these factors. China tableware, for example, is a luxury good and has the highest elasticity.

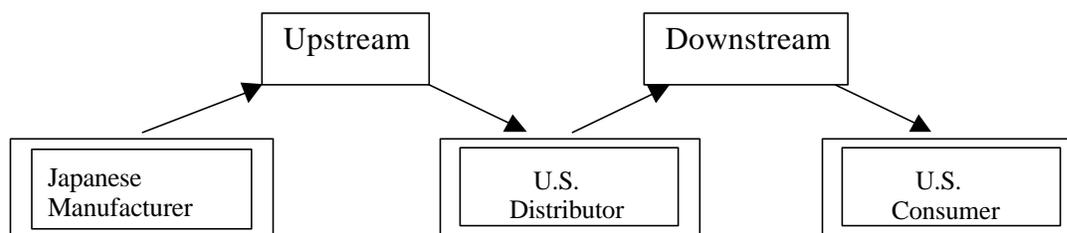
Exhibit 2
Estimates of Price Elasticity¹⁰

Product	Elasticity
Industrial Chemicals	0.4
Shoe repairs and cleaning	0.4
Food, tobacco, and beverages	0.5
Newspaper and magazines	0.5
Data processing, precision, and optical instruments	0.7
Medical care and hospitalization insurance	0.8
Metal products	1.1
Purchased meals (excluding alcoholic beverages)	1.6
Electricity (household utility)	1.9
Boats, pleasure craft	2.4
Public Transportation	3.5
China tableware	8.8

Academic research into measuring the distribution of FX rate effects typically calculates “pass-through” coefficients, or the percentage of FX movement that is passed through to prices at each level of trade. As shown in Exhibit 3, FX movements that are passed from the manufacturer to the distributor are defined as upstream pass through, and FX movements that are passed from the U.S. distributor to the consumer are defined as downstream pass through.

¹⁰ Shulman, Steven, *Demand and Elasticity*, at <http://freya.cbpa.louisville.edu/~a0izyu01/econ500/ch07/sld003>.

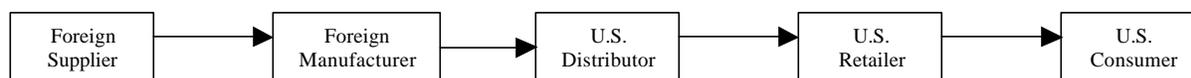
Exhibit 3 Pass Through Illustration



Empirical work in recent years has shown upstream and downstream pass through to be less than 100 percent.¹¹ Upstream, depending on relative market power of the product, the manufacturer may choose to absorb unfavorable currency moves in order to maintain or expand market share; this is called pricing to market. In the 1980s, for example, Japanese manufacturers avoided raising the dollar prices of many of their products and absorbed most of the costs from appreciation of the yen.¹² Relative market power is a factor in downstream pass through as well, but the primary factors are the import's share of the distributor's business,¹³ and the perceived responsiveness of consumer demand to changes in price (demand elasticity).

For real changes in exchange rates (i.e., nominal changes in spot exchange rates adjusted for differences in underlying inflation rates), the whole "value chain" – consisting for example of upstream suppliers, manufacturer, distributor, retailers, and consumers – collectively experiences any resulting increase or decrease in profit. (In the case of a consumer, we refer not the consumer's profit but to its consumer surplus, defined as the difference between what the consumer would have been willing to pay and what he or she actually pays.) A key question is how that increase or decrease gets distributed among the members of the value chain. In Exhibit 4, we assume that the upstream suppliers and manufacturer are in Japan and the distributor, retailer, and consumers are in the United States. Assume that before a currency shift, one dollar purchases 100 yen and the price the distributor pays to the manufacturer (the "across the ocean" price) for one unit is \$4, equal to 400 yen. Suppose next that the exchange rate shifts so that one dollar purchases 80 yen.

Exhibit 4



What happens to the prices at each link in the value chain and to each member's profit?

¹¹ McKee, Patton, and Kapoor, "Quantifying the Effect of Foreign Exchange Rate Fluctuations on the Profits of Distributors," *Tax Management International Journal*. June 1995. Volume 24. No. 6. pp 278-285.

¹² Bajah, Makesh, PhD; Becker, Brian PhD; Neuberger, Jonathon PhD, "Transfer Pricing and Foreign Exchange Risk," *Tax Management Transfer Pricing Report*. Volume 8. Number 6.

¹³ McCarthy, Jonathan "Pass-Through of Exchange Rates and Import Prices to Domestic Inflation in some Industrialized Economies." Federal Reserve Bank of New York. September 2000.

One extreme result would be for the foreign manufacturer to charge the same yen price to the U.S. distributor. On the Japanese side, the value chain members keep the same prices and realize the same profits as before. In dollar terms, however, the U.S. distributor's purchase price increases from \$4 to \$5. So the distributor, retailer, and consumer must collectively suffer \$1 in decreased profit and consumer surplus. This extreme situation – in which the U.S. parties bear all of the pain – might occur if the good in question were produced only in Japan and those who needed the good could not easily substitute other goods.

Another extreme result would be for the foreign manufacturer to charge the same *dollar* price to the U.S. distributor. On the U.S. side, the value chain members keep the same prices and realize the same profit as before. But the value to the foreign manufacturer of the same \$4 price is now worth only 320 yen instead of 400 yen. The foreign manufacturer and its suppliers collectively share this 80-yen decrease in profit. This extreme situation – in which the Japanese parties bear all of the pain – might occur if U.S. manufacturers, using U.S. suppliers, manufacture the goods in question in plentiful supply. The U.S. distributors might switch to U.S. manufacturers rather than pay a price increase to Japanese manufacturers.

In the more typical case, the foreign manufacturer's price will not stay fixed in either dollar or yen terms. The foreign manufacturer might charge \$4.50, decreasing by \$0.50 the profit/consumer surplus in the United States, and decreasing by \$0.50 the profit in Japan.

The above example could be made more complex. For example, some upstream suppliers might be in Korea, and some retailers and consumers in Canada. Even in more complex scenarios, the transfer pricing inquiry must determine: (1) by how much an FX shift increases or decreases the value chain's total profit/consumer surplus; and (2) how that increase or decrease is distributed, (i.e., how will the \$1 of pain in the example above be split among all value chain members).

The degree of pass-through at each level is influenced by many factors. For example, the resulting “across-the-ocean” price depends in part on the price elasticity of export supply. Import demand elasticity may depend on other factors such as the degree to which the distributor can adjust its operations (availability of other suppliers, share of affected imports on its overall sales, etc.). Export price elasticity likewise is affected by the number of alternative distributors and by the fraction of the manufacturer's total sales in the affected markets.

However, the primary determinant is the price elasticity of demand – the degree to which domestic prices are sensitive to import price changes. The elasticity will itself depend upon many factors such as the share of imports in the domestic market, the share the affected goods have of the consumer's budget, and the availability of substitutes.

Exhibits 5 and 6 provide an example of how the combined effects of a yen depreciation may be distributed among a Japanese manufacturer having only yen-based costs, its U.S. distributor, and U.S. consumers. Before the yen depreciation, assume the average unit price is \$1.20, which provides the distributor and manufacturer with operating margins of approximately 8.3 and 20 percent, respectively:

Exhibit 5

Before FX Change	Mfg	U.S. Dist.	System Results	U.S. Demand
Quantity				10,000
Avg. Selling Price	¥100	\$1.20		
Revenue	¥1,000,000	\$12,000	\$12,000	
Cost of Goods	¥800,000	\$10,000	\$8,000	
SG&A		\$1,000	\$1,000	
Profit	¥200,000	\$1,000	\$3,000	
Exchange Rate (yen per dollar)	100	100		

Now assume that the yen depreciates from 100 to 110 per dollar. Exhibit 6 shows how the effects of the currency change may be shared. The ability of each actor to retain a share of the benefits depends on the price elasticity of demand at each level and the willingness of the manufacturer and distributor to pass the benefit to the consumer in order to increase sales. In the example below, the manufacturer increases its yen-selling price by 4 percent to obtain a portion of the benefits of the positive currency move. The distributor lowers unit prices by \$.05, increasing demand (and its SG&A) by 10 percent (the 10 percent increase in SG&A reflects no cost savings from economies of scale and likely is conservative). The distributor retains a small portion of the benefits of the currency move, but sees significantly higher gross profit because of increased unit demand. The consumer benefits from a lower price.

Exhibit 6

After FX Change	Mfg	U.S. Dist.	System Results	U.S. Demand	Total Channel
Quantity				11,000	
Avg. Selling Price	¥104	\$1.15			
Revenue	¥1,144,000	\$12,650	\$12,650		
Cost	¥880,000	\$10,400	\$8,000		
SG&A		\$1,100	\$1,100		
Profit	¥264,000	\$1,150	\$3,550		
Exchange Rate (¥:\$)	110	110			
Change in ¥ Profit	¥64,000				
Change in \$ Profit and Consumer Surplus	\$400	\$150	\$550	\$525	\$1,175
Share of Total Change	37%	14%	51%	49%	100%

The manufacturer chose not to incorporate the full yen depreciation, perhaps due to competition from other Japanese exporters or perhaps to increase its share of the U.S. market. The distributor's price cut leads to a 10-percent increase in the manufacturer's unit sales. Because the manufacturer's yen-based per-unit cost is unchanged, the manufacturer sees a significant increase in yen profit (from ¥200,000 to ¥264,000), dollar profit (from \$2,000 to \$2,400) and operating margin (from 20 to 23.1 percent).

The distributor, like the manufacturer, benefits both directly and indirectly from the yen depreciation. The distributor's per-unit dollar cost of goods actually decreases by 5.45 cents

(from \$1 to \$.9455 per unit). The distributor passes most of this dollar-price decrease to consumers and retains .45 cents per unit. The distributor obtains an indirect benefit as well through increased unit sales. Its total profit increases from \$1,000 to \$1,150 and its operating margin from 8.3 to 9.1 percent.

The U.S. consumer benefits, of course, from the price decrease. The increase in profit under the U.S. Demand column in Exhibit 6 represents the resulting increase in consumer surplus for U.S. consumers. The first part of this savings represents the reduction in total purchase value for the original quantity ($10,000 * \$0.05 = \500). The second part arises from consumers' willingness to purchase additional units at the lower price (calculated as $0.5 * \$0.05 * 1,000 = \25 , under the assumption that demand varies linearly with price).

C. Tools for Estimating and Reducing FX Risk

1. Determinants of Exchange Rates and FX Volatility

In the modern system of floating exchange rates, the price of one currency relative to another is determined by supply and demand. This supply and demand balance reflects the expectations of thousands of investors worldwide, and fluctuates constantly in response to an endless array of economic and geopolitical events. For such an intimidating task as figuring out what makes FX rates move, the following remarks offer some encouraging direction:

Fluctuations in exchange rates are continual and often defy explanation, at least in the short run. In the long run, however, there are linkages between domestic and foreign inflation, and between interest rates and foreign exchange rates. These relationships provide an underlying theory of international product and financial market equilibrium.¹⁴

The following table illustrates simple theories linking exchange, interest and inflation rates.¹⁵ As the discussion below explains, while current interest rates and expected inflation rates have strong links to expected changes in exchange rates, they cannot reliably predict actual changes.

¹⁴ Van Horne, James, Financial Market Rates and Flows, 5th edition, Prentice Hall (1998), p. 238.

¹⁵ Ibid, p. 628.

Exhibit 7

Differences in Interest Rates $\frac{1 + I_F}{1 + I_S}$	Equals	Expected Differences In Inflation Rates $\frac{1 + I_F}{1 + I_S}$
Equals		Equals
Differences between forward And spot exchange rates $\frac{F_{\$/\$}}{S_{\$/\$}}$	Equals	Expected change in Spot exchange rates $\frac{E(S_{\$/\$/t})}{S_{\$/\$}}$

These relationships are reflected in the concepts of purchasing power parity (“PPP”), covered interest rate parity (“CIP”) and uncovered interest rate parity (“UCIP”).

a. Purchasing Power Parity

According to PPP, the expected change in the spot exchange rate between two currencies is directly related to the difference in the two currencies’ inflation rates.¹⁶ The inflation rate difference is offset by opposite movement in the spot exchange rate over time, with the higher inflation currency depreciating versus the lower inflation currency. For example, if country A has inflation that is two percentage points higher than country B, then country B’s currency would increase in value relative to country A’s currency by two percent each year.

PPP is closely related to the so-called “Law of One Price,” which states that a commodity will sell for the same price (adjusting for differences in transaction costs) regardless of where it is purchased. The relationship between PPP and the Law of One Price is complex. One aspect of this relationship is that if one assumes that (1) the Law of One Price holds, (2) the services components of economies are negligible, and (3) transaction costs of importing goods are negligible, then PPP follows as a logical consequence.

Empirical evidence indicates that PPP holds better between economies characterized by competitive product markets and mature industries for commodity goods, where demand is highly sensitive to price. For countries with newer industries with emerging technology, and countries in which inflation is driven more by non-traded items, such as services, PPP does not hold as well.¹⁷ It has also been shown that PPP generally gives the correct direction of FX movements over long periods, especially between countries with substantially different inflation rates. However, for two large countries with stable currencies and low inflation, short-term

¹⁶ Van Horne, James, Financial Market Rates and Flows, 5th edition, Prentice Hall (1998), p. 238.

¹⁷ Van Horne, James, Financial Market Rates and Flows, 5th edition, Prentice Hall (1998), p. 238.

currency movements seem detached from PPP (i.e., other volatility factors overwhelm the inflation effect).

b. Covered Interest Rate Parity (CIP)

CIP states that interest rate differences offset forward-spot exchange rate differences.¹⁸ This relates closely to PPP since inflation is a major component of a country's interest rate, but CIP differs in two ways. First, instead of comparing the present spot exchange rate with the actual future spot exchange rate, CIP compares the present spot and forward exchange rates. The forward rate is the rate at which parties contract today to exchange currency on a specified future date. Second, instead of comparing inflation rates, CIP compares nominal interest rates (e.g., the rate that a bank would charge for a loan). The nominal interest rate includes the inflation rate and the real interest rate.¹⁹ Since real interest rates are thought to be fairly constant over countries with open capital markets, differences in nominal interest rates are largely a result of differences in expected inflation.²⁰ CIP is expressed in the following formula for two currencies X and Y:

$$F(x,y) = S(x,y) * ([1+i_x]/[1+i_y])^t \quad \text{(Equation 1)}$$

where

- F(x,y) is the forward rate of currency X expressed per unit of currency Y (e.g. F(x,y) = 0.5 if 0.5 units of X will be worth 1.0 unit of Y);
- S(x,y) is the spot rate of currency X expressed per unit of currency Y;
- i_x is the interest rate in country X;
- i_y is the interest rate in country Y; and
- t is the time in years or fractions thereof.

CIP holds very closely in the real world because of the potential for arbitrage (i.e., the riskless opportunity for profit through simultaneous purchase and sale of nearly identical financial instruments). For example, assume that U.S.\$ 0.90 = 1.00 Euro (€) in the current spot market, that the U.S.\$ interest rate = 3% per annum, the €interest rate = 5% per annum, and we want to consider the forward exchange rate six months hence. Applying Equation 1 above:

$$\begin{aligned} F(\$,\text{€}) &= S(\$,\text{€}) * ([1+i_{\$}]/[1+i_{\text{€}}])^{1/2} \\ &= 0.9000 * (1.03/1.05)^{1/2} \\ &= 0.8914 \end{aligned}$$

So, if one wanted to contract today to buy € for \$ and exchange them in six months, the rate would be \$0.8914/€ instead of the spot rate of \$0.9000/€

¹⁸ Van Horne, James, *Financial Market Rates and Flows*, 5th edition, Prentice Hall (1998), p. 240.

¹⁹ The real interest rate represents the compensation required by a lender to forego current consumption. It is the real profit (net of inflation) that a lender can make. If i is the inflation rate, n the nominal interest rate, and r the real interest rate, then $1+n=(1+i)*(1+r)$, which is equivalent to $n=r+i+i*r$. For moderate rates, $i*r$ is quite small so that $n=i+r$ provides a good approximation.

²⁰ The so-called "International Fisher Effect" suggests that differences in interest rates across countries are largely a result of differences in expected inflation.

If the 6 month forward rate were simply \$0.9000, an investor could make a riskless profit by borrowing U.S. dollars at 3 percent interest, exchanging them for euro in the spot market at \$0.9000/€ holding the euro in a bank deposit that earns 5 percent, then contracting forward 6 months to exchange the euro back to dollars (which will more than repay the dollar loan with interest). With \$1 million initially borrowed, these transactions produce the following results:

- a) Initial spot market exchange: $\$1,000,000/0.90000 = \text{€}1,111,111$;
- b) Proceeds invested at 5% for 6 months: $\text{€}1,111,111 \times (1.05^{1/2} - 1) = \text{€}7,439$ interest;
- c) Total Euros: $\text{€}1,111,111 + \text{€}7,439 = \text{€}1,138,550$;
- d) Settle forward contract by exchanging: $\text{€}1,138,550 \times 0.9000 = \$1,024,695$;
- e) Accrued interest on U.S.\$ loan: $\$1,000,000 \times (1.03^{1/2} - 1) = \$14,889$;
- f) Repay principal and interest of U.S.\$ loan: $\$1,000,000 + \$14,889 = \$1,014,889$; and
- g) Profit earned without taking any market risk: $\$1,024,695 - \$1,014,889 = \$9,806$.

Substituting the CIP forward rate of \$0.8914/€ into step (d) would eliminate the arbitrage profit.

c. Uncovered Interest Rate Parity (UCIP)

If CIP holds, should interest rate differences also predict future FX spot rates? Is the 6 month forward rate the spot rate 6 months from now, at least on average? Under UCIP, current spot rates and interest rate differences should form an unbiased predictor of future spot rates. Empirical FX studies do not confirm UCIP. Higher interest rate currencies do depreciate, but to a lesser extent than UCIP predicts.²¹

We can draw a few main conclusions from PPP, CIP and UCIP. First, countries with vastly different macroeconomic environments have different FX behavior. Second, CIP holds very closely, within the limits of transaction costs. Some view the forward discount or premium caused by interest rate differentials to be an ‘expectation’ of future FX rates, but CIP is probably more related to the arbitrage restriction than to true expectation. Third, UCIP does not seem to predict future spot FX rates well. In fact, empirical evidence shows that actual spot movements fall short of changes expected under UCIP.²² Finally, FX rates and fluctuations are difficult or impossible to predict.

2. How Firms Reduce FX Risk

Businesses invest in other countries to enhance their profitability through increased sales, economies of scale, reduced costs and diversified operations. FX fluctuations can significantly alter international investment performance, but can be managed in a variety of ways.

As discussed above, the international monetary system of floating exchange rates has brought higher volatility to currency markets. Econometric models for predicting FX movements

²¹ Van Horne, James, *Financial Market Rates and Flows*, 5th edition, Prentice Hall (1998), p. 244.

²² This academic evidence suggests that a trading opportunity exists to simply hold the higher interest rate currency and not hedge or lock-in the forward rate. However, the actual data is not strongly convincing, and such a strategy would be largely speculative and more risky than most investors or corporations would be willing to undertake.

generally are unreliable. Accordingly, FX risk management has increased dramatically in importance since the advent of the floating FX system, although remaining unhedged is an option.

FX risk can be managed in a number of ways, but most of the techniques can be grouped into two broad categories: 1) “natural” hedging; and 2) hedging with financial instruments/derivatives. Risk management techniques vary depending on the type of FX risk involved (*i.e.*, translational vs. economic, etc.). For a given foreign investment, all four types of FX risk mentioned above may be involved and may have blurred boundaries, complicating the task of managing the risks.

a. Natural Hedging

Natural hedging refers to operational changes that mitigate or eliminate FX risk without the use of financial instruments or derivatives. For example, multinational businesses are concerned about depreciation of assets held in a foreign currency due solely to adverse FX movements. They can reduce this financial FX risk by matching long-term liabilities with assets. If liabilities are denominated in the same currency as assets, FX fluctuations that cause asset values to fall also cause liabilities to shrink. A match between assets and liabilities prevents loss of value, at least partially, without the costs and complications of separate financial market transactions. Of course, most businesses’ assets exceed their liabilities, so this approach generally does not eliminate FX exposure.

The same matching approach applies to periodic profitability (income statement items). For example, multinational business with significant sales in a foreign currency may be concerned that the sales currency will depreciate against their functional currency, causing a sudden reduction in functional-currency earnings.²³ If expenses are denominated in the same currency as the sales, the impact on bottom line profitability from FX changes is reduced. Again, revenues are expected to exceed expenses, so net income cannot be hedged completely in this natural manner.²⁴ Businesses commonly apply this matching concept by diversifying their manufacturing operations and sourcing production input materials from foreign countries in which significant sales are denominated. German and Japanese companies’ investment in U.S. manufacturing plants in the 1980s is a classic example of natural hedging for this type of economic or transactional FX risk.

Multinational businesses can also manage some transactional FX exposure through contractual arrangements. A typical contract for purchase of inputs or sale of product between parties with different functional currencies could be negotiated so that one party bears all the FX risk or so that they share it in some proportion. Fixed pricing in one party’s currency allocates all risk to the other party. The parties could split FX risk as desired by agreeing to adjust the price in a specified way based on FX shifts, or by contracting for payment partly in one currency and partly in the other. The allocation of FX risk likely will affect the quoted price of the transaction.

²³ Davis, H.A., and F.C. Militello, Foreign Exchange Risk Management: A Survey of Corporate Practices, (1995), Financial Executives Research Foundation, p. 80.

²⁴ As discussed elsewhere in this section, it is possible to hedge net assets and/or net income using financial instruments.

Like other forms of natural hedging, this approach mitigates or eliminates transactional FX exposure without the cost of financial market trades.

b. Hedging with Financial Instruments

The use of financial products to manage FX risk is common today. The large and growing number of purchasers increased the depth and stability of the market.²⁵ Such transactions may be negotiated privately through a financial intermediary (“over-the-counter” or “OTC”) or consummated through a public exchange or market (“exchange-traded”). Common OTC FX transactions include spot and forward contracts, cross-currency swaps, and currency options. Examples of exchange-traded products are FX futures contracts and options on futures. While OTC transactions can have highly flexible terms specific to the needs of the user, they are often illiquid due to their unique structures. Exchange-traded products come with standardized contract sizes and terms, and usually are liquid, readily tradable instruments. Exchange-traded instruments also carry no counter-party credit risk because the exchange itself imposes strict credit requirements, a significant consideration for businesses that do significant hedging.

Through the use of these financial instruments, multinational businesses can manage FX exposures if two basic conditions are satisfied:²⁶ 1) the asset (e.g., the Euro currency) creating the risk, or one closely correlated with it, trades in financial markets; and 2) the amount and timing of the exposure being hedged is known with reasonable certainty. The second condition limits financial instruments’ effectiveness against economic FX risk because of its inherent uncertainty, variability and long timeframe.

Transactional FX risk, on the other hand, is relatively easy to hedge. For example, if a U.S. manufacturer (US Co) sells goods in Europe and receives payment in Euros at the end of each quarter, it can simply sell Euro forward for dollars (i.e., contract now to sell Euro for dollars on specified future dates) and schedule the transactions to settle at each quarter’s end. Here, the timing of the payments is certain, and as long as US Co can estimate the amount of the Euro invoices accurately, it can effectively remove any uncertainty in the ultimate dollar proceeds by using forward contracts. If the FX market moves so that the Euro sales are worth less at quarter’s end than was expected when US Co purchased the forward contract, US Co will have an offsetting gain on the FX forward contracts.

One problem with financial-instrument hedges is that they may not perfectly offset the underlying business exposure, leaving a residual speculative trading position. To exactly offset FX impact on earnings requires a precise forecast of the business exposure to be hedged, including the expected earnings. Long-run exposure is normally especially difficult to predict. Another problem with hedging long-term exposure is that hedging instruments with long terms are scarce and costly. Financial intermediaries that provide hedging contracts normally avoid risk by finding counter-parties who desire the reverse hedge. Counter-parties are difficult to find for long-term contracts, and intermediaries are reluctant to take the risk of a contract without counter-parties.

²⁵ Davis, H.A., and F.C. Militello, Foreign Exchange Risk Management: A Survey of Corporate Practices, (1995), Financial Executives Research Foundation, p.1.

²⁶ Higgins, Robert C., Analysis for Financial Management, 5th edition, Irwin McGraw Hill, (1998), pp. 185-186.

The question to hedge or not to hedge is a complex and controversial one in financial risk management. Natural hedges carry no explicit out of pocket cost and intrinsically form a better offset to economic exposures and so generally are preferred to synthetic hedges. Synthetic hedging can be likened to insurance, where the company incurs an explicit cost to reduce the risk or volatility inherent in its business results. The cost must be weighed against the risk-reducing benefits of the transactions, taking into account their precision and effectiveness. The real drivers of any hedging decision are 1) what is the risk tolerance of the company; and 2) what cost is acceptable for entering into transactions to reduce or eliminate the risk.

Some managers feel strongly that hedging either should always be done or never done, and their approaches vary tremendously. Indeed, there is an academic perspective that hedging is never appropriate since risks like FX exposure represent diversifiable risks from the shareholder perspective, and thus, the cost is wasted effort for shareholders. Some managers share this view, but most multinational businesses of significant size engage in some financial hedging transactions. Major arguments for and against hedging are displayed in Exhibit 8.

Exhibit 8

Theoretical Arguments on Hedging²⁷	
<i>For</i>	<i>Against</i>
Managing earnings volatility from FX risk can reduce a firm's potential cost of financial distress.	PPP and CIP imply compensating levels of FX rates and prices.
Firms in financial distress face higher contracting costs with customers, suppliers, and employees.	FX rates even out over time.
Firms that hedge and reduce their earnings volatility pay less taxes over the long run if tax rates increase with income levels.	With transaction costs, hedging is a losing bet on average.
Managing FX risk and smoothing earnings volatility has a positive effect on stock price and shareholder value.	Shareholders can diversify their own portfolios to compensate for FX risk.
Certainty may create administrative benefits such as more accurate performance evaluation or improved employee morale.	Investors may choose a stock precisely because they want exposure to a particular currency for diversification.

Hedging decisions are not always driven by economics. To a financial manager faced with economic FX risk, losing profit passively because of FX movements may in some cases be more palatable than becoming directly accountable for the loss from a derivative transaction, even if the instrument used offsets the business exposure well, and therefore, is neutralized by a positive FX impact on the business. Not all managers have a thorough understanding of hedging and financial products, which further contributes to a reluctance to transact, regardless of the magnitude of risks faced. High profile derivatives losses sustained in the 1990s increase executives' resistance to using derivatives.

Other organizational issues such as budgets and incentive compensation targets can also affect FX risk management approaches. The academic argument against hedging with financial

²⁷ Davis, H.A., and F.C. Militello, Foreign Exchange Risk Management: A Survey of Corporate Practices, (1995), Financial Executives Research Foundation, pp. 79-80.

instruments frequently loses out to arbitrary business unit budget levels. If costs or profits can be fixed at a level where the annual budget is met by executing hedging transactions, a manager may hedge regardless of the costs and whether or not the consolidated firm can tolerate the risk. Incentive compensation goals also frequently are based on some profit target, cost reduction metric, or other financial measure, and thus subject to translational risk. If hedging can lock in profits above the threshold, managers may choose to do away with the market uncertainty. Conversely, if hedging locks in a level of profit below the bonus threshold, a manager might be more inclined to let it ride with the FX market. Another consideration is that an FX move that turns a business unit's expected profit into a loss may hurt morale for the operating staff who worked hard to achieve the profitable result.²⁸

c. Conclusions on Corporate FX Risk Management

Multinational businesses are affected by and address FX risk in many and varied ways. Natural hedges such as asset/liability matching or geographic diversification of operations are inherently the most effective and cost efficient methods to reduce economic FX risk. Financial instruments can counteract transactional risk, and in some cases, remove a large amount of translational income volatility relative to their cost.

There does not seem to be any typical way in which parties contractually allocate FX risk in international transactions. Either party can bear 100 percent of the risk, or it can be shared, but the price of the underlying transaction may be affected by the apportionment of the FX risk.

Finally, parties have tools to reduce economic FX risk, but not to eliminate it. A typical APA involves a tested party that, with or without hedging, continues to bear some economic FX risk.

III. FX Risk and Transfer Pricing Methods

A. Section 482 Permits Adjustments for FX Changes

Under U.S. transfer-pricing regulations, a tested party's controlled prices and thus its true taxable income are determined according to the standard "of a taxpayer dealing at arm's length with an uncontrolled taxpayer."²⁹ In most circumstances, an arm's length result is "determined by reference to the results of comparable transactions under comparable circumstances."³⁰ Among the relevant circumstances is the risk of "fluctuations in foreign currency rates."³¹ If the tested party and the comparable companies experience materially different FX changes, and the effect of such differences on prices or profits can be ascertained with sufficient accuracy to improve the reliability of results, adjustments must be made.³²

A complete FX analysis might make three adjustments: (1) adjust each comparable company's results for differences between its and the tested party's FX risk profiles; (2) eliminate the impact

²⁸ Higgins, Robert C., *Analysis for Financial Management*, 5th edition, Irwin McGraw Hill, (1998), pp. 179-182.

²⁹ Treas. Reg. § 1.482-1(b)(1).

³⁰ Treas. Reg. § 1.482-1(b)(1).

³¹ See Treas. Reg. § 1.482-1(d)(3)(iv).

³² Treas. Reg. § 1.482-1(d)(2).

of FX changes on the comparable companies' profitability during the testing period; and (3) adjust the tested party's results, derived from the comparable companies' results after adjustments (1) and (2), for the impact of the tested party's FX experience during the period under review (here, the APA term). This paper addresses solely the adjustment to the tested party's results for actual FX experience ("FX Experience Adjustments"), but briefly summarizes here the other two adjustments:

- **FX Risk Profile Adjustment:** The starting point for a risk-profile adjustment is to determine the FX risks that the tested party and comparable companies bear. This may be a difficult assessment in the case of the comparable companies since public data may be unavailable. In the case of the tested party, the multinational businesses may contractually allocate a share of FX risk to the tested party. Alternatively, the parties' conduct may treat the tested party as sharing such risk. The tested party is treated as possessing FX risk only if it has the financial capacity to bear the potential FX losses.³³ If the comparable companies face materially different FX risks, adjustments may be appropriate.
- **Adjust Comparable Companies' Results for Impact of FX Changes:** If a comparable company experiences profit-altering FX changes during the testing period, the impact of those changes on profitability must be eliminated from the comparable company's results. This adjustment may also be difficult since data regarding the comparable companies' FX risks may be unavailable and for other reasons.

An FX Experience Adjustment, and the adjustments summarized above, are made only if they improve the reliability of the results under the applicable method. In the following discussion, we focus on structuring FX Experience Adjustments when the transfer pricing method is the CPM or RPSM and address only economic FX risk. The principles discussed below may be relevant, however, to transaction-based methods and other types of FX risk as well.

³³ Treas. Reg. § 1.482-1(d)(3)(iii)(C), Example 3.

B. Transfer Pricing Methods May Alter FX Risk

Before considering whether an FX Experience Adjustment is appropriate, it is necessary to determine whether the applicable transfer pricing method properly allocates FX gain or loss among controlled parties. As the following examples illustrate, both the CPM and the RPSM may improperly allocate FX gain or loss in some circumstances.

1. CPM

Acme Inc. manufactures products in the United States and sells them in Germany through a wholly-owned distributor, Acme GmbH. Acme worldwide has economic FX risk because Acme Inc. incurs costs in U.S. dollars and Acme GmbH's sales are in Euro. Assume that the parties contractually allocate all economic FX gain or loss to Acme GmbH and that this is arm's-length behavior.

Under the CPM transfer-pricing method, assume Acme GmbH must earn a 10-percent operating margin. In the following example, all transactions occur at a 1:1 euro/dollar exchange rate, which has been a stable rate.

Exhibit 9			
	Acme Inc.	Acme GmbH	Consolidated (in \$)
Sales	\$70.00	€100.00	
COGS	\$50.00	€70.00	
Gross Profit	\$20.00	€30.00	
Operating Expense	\$10.00	€20.00	
Booked Operating Profit	\$10.00	€10.00	\$20.00
Exchange Rate (Euros per \$)		€1	
Operating Margin		10%	

Since the exchange rate has been stable, neither Acme Inc. nor Acme GmbH incurs an economic FX gain or loss. Acme GmbH earns the required 10-percent operating margin.

Now assume that the euro/dollar exchange rate changes to 1.10:1. Assume further that the FX change is not met with commensurate price inflation in Germany so that Acme GmbH's sales remain €100. Absent an adjustment to return Acme GmbH to a 10-percent operating margin, the results would be:

Exhibit 10

	Acme Inc.	Acme GmbH (in euro)	Acme GmbH (in dollars)	Consolidated (in \$)
Sales	\$70.00	€100.00	\$90.91	
COGS	\$50.00	€77.00	\$70.00	
Gross Profit	\$20.00	€23.00	\$20.91	
Operating Expense	\$10.00	€20.00	\$18.18	
Booked Operating Profit	\$10.00	€3.00	\$2.73	\$12.73
Exchange Rate (Euro per \$)		€1.10	€1.10	
Operating Margin		3%		

Acme GmbH thus incurs the currency losses, as the parties agreed, but earns only a 3-percent operating margin. To maintain Acme GmbH's required 10-percent operating margin, the parties must make an adjustment that reduces Acme GmbH's COGS payment to Acme Inc. from €77 to €70, as illustrated in the following exhibit:

Exhibit 11

	Acme Inc.	Acme GmbH (in euro)	Acme GmbH (in dollars)	Consolidated (in \$)
Sales	\$63.64	€100.00	\$90.91	
COGS	\$50.00	€70.00	\$63.64	
Gross Profit	\$13.64	€30.00	\$27.27	
Operating Expense	\$10.0	€20.00	\$18.18	
Booked Operating Profit	\$3.64	€10.00	\$9.09	\$12.73
Exchange Rate (Euro per \$)		€1.10	€1.10	
Operating Margin		10%		

Acme Inc. now incurs the losses from the FX change. The CPM effectively changes the parties' agreed allocation of FX risk. An FX Experience Adjustment would be needed to return the parties to their agreed allocation of FX risk.

Tested parties that formally bear no FX risks, such as some routine distributors, may still share in F gain or loss under a range CPM. For example, a tested party subject to a 2-4% operating margin CPM, and that earns a 3% operating margin before sharing in FX gain or loss, can share in F gain or loss until its operating margin hits a bound of the CPM range. A point TPM of 3% would have ensured that the tested party could not share FX gain or loss.

2. RPSM

Assume the same facts as in the base case CPM example above, but under an RPSM that provides for a 50:50 profit split between Acme Inc. and Acme GmbH. With a stable 1:1 exchange rate, the results are as follows:

Exhibit 12

	Acme Inc.	Acme GmbH	Consolidated
Sales	\$70.00	€100.00	
COGS	\$50.00	€70.00	
SG&A/routine profit	\$10.00	€20.00	
Residual Profit	\$10.00	€10.00	\$20.00
Exchange Rate (Euro per \$)		€1	
Profit Split Factor	50%	50%	

If the euro depreciates to 1.10 per dollar, the euro cost to Acme GmbH for its purchases from Acme Inc. goes up:

Exhibit 13

	Acme Inc.	Acme GmbH (in euro)	Acme GmbH (in dollars)	Consolidated
Sales	\$70.00	€100.00	\$90.91	
COGS	\$50.00	€7.00	\$70	
SG&A/routine profit	\$10.00	€20.00	\$18.18	
Residual Profit	\$10.00	€3.00	\$2.73	\$12.73
Exchange Rate (Euros per \$)		€1.10	€1.10	
Profit Split Factor (before applying profit-split TPM)	78.55%	21.45%	21.45%	

Acme GmbH thus incurs the losses from the unfavorable FX change, but earns only 21.45% of residual profit. To maintain the 50:50 profit split, the parties must reduce Acme GmbH's COGS payment to Acme Inc. from €7 to €3:

Exhibit 14

	Acme Inc.	Acme GmbH (in euro)	Acme GmbH (in dollars)	Consolidated
Sales	\$66.36	€100.00	\$90.91	
COGS	\$50.00	€3.00	\$66.36	
SG&A/routine profit	\$10.00	€20.00	\$18.18	
Residual Profit	\$6.36	€7.00	\$6.37	\$12.73
Exchange Rate (Euros per \$)		€1.10		
Profit Split Factor	50%	50%	50%	

Acme Inc. and Acme GmbH now share equally the FX loss, changing the parties' agreed allocation of FX risk. An FX Experience Adjustment would be needed to return the parties to their agreed allocation of FX risk.

The above example assumes that the parties share FX risk in a different proportion than they share residual profit. This may not be the case. The parties may, through chance or planning,

share FX risk and residual profit in the same proportions, in which case an FX Experience Adjustment likely would not be necessary.

C. FX Experience Adjustment Provisions

The previous section indicates that an FX Experience Adjustment may be appropriate where the transfer pricing method is the CPM or the RPSM. APAs that provide FX Experience Adjustments must anticipate how FX changes would alter the tested party's profits.

Such predictions are difficult. No two taxpayers are affected the same way by an FX change. Depending on the economic environment, manufacturers may absorb most or all of the costs or benefits of an FX change while others may pass the costs or benefits to distributors, suppliers or consumers. Businesses also can reduce the impact of unfavorable FX moves by using financial instruments or by restructuring their operations. For instance, they may change the denomination of cash deposits, restructure contracts, relocate plants, or change the source of capital or production materials. Even companies that hedge or optimally structure their operations to reduce FX risk may be disadvantaged, however, if a competitor experiences a favorable exchange rate move.

These factors rule out a generally applicable FX adjustment mechanism. But in recent years, numerous commentators have proposed mechanisms that adjust prices or profits for changes in exchange rates.³⁴ In general, these mechanisms identify relevant changes in exchange rates, measure the magnitude of the changes and determine the impact of the changes on a tested party's prices or profits.

While these adjustments are limited in scope to examining the tested party's operations, they may improve the reliability of a main TPM that improperly allocates FX gain or loss. For example, where the CPM or RPSM improperly allocates currency gain or loss, the APA Program agrees that a properly tailored FX Experience Adjustment may improve the reliability of results.

To determine whether the TPM allocates FX gain or loss properly, we determine (1) what FX risks the tested party bears; whether, based on those risks, the tested party has FX gain or loss for the year; and (3) whether the applicable method properly allocates such FX gain or loss to the tested party.

The APA Program identified five elements to consider when evaluating whether a TPM properly allocates FX gain or loss and to make adjustments if the TPM does not: (1) determine the relevant currencies and the relevant transactions that are priced in those currencies; (2) determine the portion of FX gain or loss that the controlled parties are expected to pass through to

³⁴ E.g., Edinaldo A. Silva, *Foreign Exchange Adjustments Under §482*, Transfer Pricing Reporter at 416-8 (Nov. 29, 1995); Toru Nakamura, *Adjusting for Currency Risk in a Transfer Pricing Analysis*, Transfer Pricing Reporter at 767-9 (March 27, 1996); Lawrence Olson, *Transfer Prices and Exchange Rates for Japanese Companies Operating in the United States*, Transfer Pricing Reporter at 886-8 (April 12, 1995); Ahmad Shahshahani, *Currency Exchange Rate Adjustment Under IRS Section 482*, 4 Economic Issues at 1-9 (Fall, 1998); Harlow N. Higinbotham, *The Profit Split Method: Effective Application for Precision and Administrability*, 5 BNA Tax Management Transfer Pricing Special Report at 18-20 (Oct. 2, 1996).

uncontrolled parties; (3) determine the portion of FX gain or loss that the tested party bears; (4) measure the total amount of currency gain or loss and the tested party's share; and (5) provide an adjustment mechanism that determines whether the main TPM properly allocates the FX gain or loss and, if not, alters the main TPM's allocation (e.g., through an adjustment to the tested party's COGS, gross margin or some other indicator).

1. Elements to Consider

The APA Program has seen several requests for FX Experience Adjustments that involve a foreign manufacturer with a U.S. distributor. Under those proposals, if the manufacturer's currency moves relative to the U.S. dollar, an adjustment is made to the distributor's results to reflect the distributor's share of the cost or benefit of that move. Each tested party's FX circumstances are unique and the same FX changes may produce different results for different tested party-distributors. But each case we have seen addresses, implicitly or explicitly, each of the five elements identified above and described below.

a. Determining Relevant Transactions and Foreign Currencies

An APA provision that makes an FX Experience Adjustment must determine the actual FX risk that the tested party faces. This is a difficult, fact-intensive determination. The controlled transactions may involve manufacturing plants in different countries that use different currencies. Each manufacturing plant may obtain inputs in other currencies. Some inputs may even be U.S.-dollar denominated. For example, a U.S. distributor's controlled transactions may include purchases from manufacturing plants located in Japan and Canada. The Japanese plant may obtain inputs from Thailand and the Canadian plant from the United States. In this example, an FX Experience Adjustment may need to consider the fluctuations of the yen, the Canadian dollar and the Thai bhat against the U.S. dollar. The tested party may also make sales in multiple currencies.

After determining the relevant foreign currencies, it is necessary to determine the extent to which relevant purchase and sale transactions are priced in each currency. This may be a simple matter, in the example above, of totaling the third-party yen payments of the Japanese manufacturer, or it may require examining significant supply contracts to determine whether the contract's nominal currency is in fact the currency that controls pricing. For example, a yen-based contract that adjusts the yen price when the bhat/yen exchange rate changes may be considered a bhat-based supply contract.

As discussed above, even a tested party that conducts all business in a single currency may have FX risk (e.g., its principal competitors are harmed or benefited by F changes). In these circumstances, an FX Experience Adjustment mechanism that measures the tested party's transactions cannot improve the reliability of results, while measuring the impact of FX changes on the competitors' results likely will be difficult.

A taxpayer requesting an FX Experience Adjustment provision should provide sufficient data to ensure that the adjustment improves the reliability of results. This may be difficult to do for complex multinational businesses.

b. Pass-Through to Uncontrolled Parties

Controlled parties may seek to pass the costs or benefits of FX changes to uncontrolled parties. Manufacturers may pass the costs or benefits through to uncontrolled suppliers and employees. Distributors may pass the costs or benefits to their uncontrolled suppliers, employees and customers. As discussed above, the parties' ability to pass through FX costs and their need to pass through FX benefits depends on the demand and supply elasticities for each of these relationships.

In the typical case, at least some percentage of the cost or benefit of an FX change may be passed through to uncontrolled parties. An FX Experience Adjustment provision should exclude such pass-through amounts from the calculation of the impact of any FX move. Information on demand and supply elasticity may help to ensure that the FX Experience Adjustment provision improves the reliability of results.

c. Split of FX Risk Among Controlled Parties

The controlled parties may expressly allocate FX risk among themselves, in which case the APA Program will respect the allocation provided the tested party has the financial capacity to bear the allocated risk and the conduct of the parties is consistent with the allocation.³⁵ More often, however, the parties do not expressly allocate risk. In these circumstances, the APA Program may agree to allocate FX risk among the controlled parties in the same manner that uncontrolled parties dealing at arm's length would allocate the risk.

Determining how uncontrolled parties allocate FX risk is difficult. A U.S. distributor's contractual arrangements with manufacturers may limit the distributor's FX risk. For example, prices may be set in U.S. dollars amounts that are fixed for a period of time. In practice, however, the distributor may participate in the manufacturer's FX gain or loss. If the manufacturer is a significant client, the distributor may have much at stake in maintaining the manufacturer's U.S. market share in the face of a negative currency move. The distributor may have adapted assets and systems and trained employees to distribute the manufacturer's products. The distributor may have to incur significant advertising expenses to obtain replacement business and have significant start-up costs to service that business. The distributor may thus be willing to accept, at least temporarily, a higher price from the manufacturer.

In the controlled setting, the U.S. distributor typically has only one client – the foreign parent/manufacturer – and has more at stake in maintaining the manufacturer's market share. The distributor may also lack the ability to market its own services to third-party manufacturers. For these reasons, a controlled distributor, like an uncontrolled distributor that has a significant manufacturer-client, may share at least some portion of significant system FX gains and losses.

Given the difficulties in determining how uncontrolled parties allocate FX risk, an FX Experience Adjustment that provides a range of solutions may be appropriate. Other solutions that the APA Program has seen include: (1) arbitrary percentage allocations (e.g., 50%/50% or

³⁵ Treas. Reg. § 1.482-1(d)(3)(iii)(C), Example 3.

75%/25%); (2) allocations based on the controlled parties' relative operating assets, relative invested capital, relative fixed assets, etc.; (3) allocations based on regressions from industry data for unrelated distributors; and (4) elasticities inferred from gross margin data for unrelated distributors, measuring changes in profitability following changes in FX rates. Other bases may be appropriate as well.

Another method for reflecting the split of FX risk is to establish no-change bands, change bands and critical assumptions. If the average exchange rate for the tested period is within an agreed range (*i.e.*, the "no-change band"), no adjustment is made. If the average is significantly outside the no-change band (*e.g.*, less than 50% of the low end or more than 200% of the high end of the no-change band), a critical assumption may permit cancellation of the APA. If the average is outside the no-change band, but no critical assumption applies (*i.e.*, within the "change band") an adjustment is made. Within the no-change band, the distributor implicitly does not share FX risk. The premise of the critical assumption is that substantial FX changes may undermine the assumptions on which the APA is based.

d. Measuring Relevant Change in Exchange Rates

In addition to determining the tested party's FX risk, an FX Experience Adjustment provision must measure relevant changes in exchange rates. This requires a comparison of the exchange rates prevailing during some historical base period with the exchange rates prevailing during the APA year under review. This comparison typically involves several considerations: (1) what are the prevailing historical exchange rates; (2) what are the prevailing exchange rates for the APA term; (3) what adjustments, if any, should be made to nominal FX changes to determine real exchange rate changes (*i.e.*, nominal changes adjusted for differences in underlying inflation rates); and (4) what portion of the real change in exchange rates should alter the prices or profits of the tested party?

Consideration 2 is a fairly straightforward empirical determination. In most cases, the exchange rate for an APA year is the simple average exchange rate for that year, although seasonal weightings or other conventions may be appropriate in some cases. Considerations 1, 3 and 4 are more complex.

(I) Determining Prevailing Historical Exchange Rates

The purpose of determining prevailing historical FX rates is to establish a benchmark against which to compare the exchange rate prevailing during the tested period. If the tested-period exchange rate is consistent with the benchmark, the assumption is that no FX gain or loss has occurred. Thus, the benchmark should be the point or range at which the prevailing exchange rate for the tested period has no impact on profitability.

The APA Program has seen two general approaches to establishing the benchmark historical rate. Most proposals compare the *spot* exchange rates prevailing during an historical period to the spot exchange rates prevailing during the tested period. These proposals require: (1) selection of a relevant historical period; and (2) a determination of the range of spot exchange rates that prevailed during that period. We discuss these considerations in (A) and (B), below.

The other general approach is to determine how *real* exchange rate for the currencies have changed over a period of time. For example, purchasing power parity models attempt to measure changes in real exchange rates by adjusting spot exchange rates for differences in underlying inflation and other factors. We discuss a purchasing power parity model in (C), below.

(A) Historical Period

The primary considerations for selecting an historical period is whether the period is neutral as to profitability. An FX Experience Adjustment that measures nominal FX changes should select an historical period based on the following considerations: (1) the historical period can be too long because the nominal FX rate prevailing several years prior to the tested period may have little relation to the real exchange rates prevailing during the tested period; (2) the historical period can be too short – for example, a one-day spot rate may be aberrant; and (3) trending of exchange rates should be considered – *i.e.*, if one currency moves in a consistent direction against another over a significant period of time, an historical base rate may be inappropriate. Most APAs have used two or three years or historical FX spot-rate data.

FX Experience Adjustment proposals also must address whether to adopt a “floating” or a “static” base rate. A floating base rate uses FX data from the period immediately preceding each APA *year*, while a static base rate uses data from the period immediately preceding the APA *term*. For example, a floating base rate for the fourth year of an APA term might be based on FX data from the second and third years of the APA term, while a static base rate would be based on data from the two years preceding the APA term.

A static base rate treats the historical period preceding the APA term as unique. Perhaps the spot rates prevailing during that period provide an equilibrium rate that is neither advantageous nor detrimental to the tested party and will remain so for the APA Term. But a static base rate likely will cease to be appropriate after some period of time for the reasons discussed above (*e.g.*, differences in underlying inflation rates). Another possible rationale for a static base rate is that the comparable companies’ data were obtained from the pre-APA-term period. This rationale also ignores the impact of inflation on FX rate changes.

The rationale underlying use of a floating base rate is that inflation has the least impact on exchange rates that are closest in time the tested period and that the most important nominal currency fluctuations are those that occur closest in time to the APA year. The latter assumption is consistent with the view that taxpayers are able to respond to long-term exchange rate movements, but not to significant short-term fluctuations. The APA Program’s view is that a floating base rate generally is more appropriate.

(B) Range of Prevailing Rates and No-change Band

An FX Experience Adjustment that adjusts for nominal FX changes must determine the FX rate that prevailed during the selected historical period. The prevailing rate, like the historical period, should be neutral as to profitability.

Determining a prevailing rate is not an exact science. Nominal changes in spot FX rates include both real changes and changes that reflect differences in underlying inflation rates. Accordingly, it may be difficult to select a single spot rate as providing the benchmark against which the tested period exchange rate is to be measured. For this reason, and, as discussed above, to reflect the split of FX risk between the tested party and the other members of the value chain, most FX Experience Adjustment provisions provide a range of prevailing FX rates. The range, which for example may be the high and low quarterly average spot rates for the historical period, is incorporated in the FX Adjustment Provision as a no-change band. If the FX rate for the tested year is within the no-change band, the FX Experience Adjustment will not change the results of the main TPM.

Considerations for determining the appropriate bounds of the no-change band include: (1) the volatility of the relevant FX rate – a tested party distributor may be expected to share only the costs or benefits of unexpected FX changes; (2) symmetry – a tested party should have similar opportunities for sharing in FX gains and FX losses, although exact symmetry may be inappropriate since taxpayers may incur expenses for both favorable and unfavorable FX moves; and (3) as discussed above, whether the no-change band is used to split risk among the controlled parties.

In past APA practice, the width of the no-change band has been based solely on historical FX data. For example, the no-change band might equal: (i) a specified percentage (e.g., 10 percent) either side of the average exchange rate during the historical period; or (ii) the high and low average quarterly rates from the selected historical period.

(C) Purchasing Power Parity

One APA taxpayer proposed a purchasing-power-parity approach that attempts to determine real exchange rates by eliminating the impact of differences in underlying inflation rates and other factors on spot FX rates. The approach used approximately 20 years of data to establish the historical relationship between the yen/dollar exchange rate, the U.S. price index, and the Japan price index. The historical empirical relationship is summarized in the following equation:

$$S_t = a + b_1 P_t + b_2 P^*_t$$

S_t is the logarithm of the yen/dollar exchange rate at time t , P_t is the logarithm of the Japan price index at time t , and P^*_t is the logarithm of the U.S. price index at time t . For each APA year, the values for a , b_1 and b_2 are estimated by a statistical regression using historical data; (2) a theoretical equilibrium exchange rate is computed by using the estimated a , b_1 and b_2 and actual P_t and P^*_t in the above formula; and (3) the actual FX rate is compared to the theoretical FX rate.

(II) Adjusting Nominal FX Changes for Inflation

Nominal changes in exchange rates reflect both the real change in exchange rates and differences in the inflation rates underlying the respective currencies. As discussed above, the portion of nominal FX changes that most impacts prices or profits is the “real” change. Adjusting nominal FX changes to determine real changes can be complex. A simple comparison of two countries’ consumer price inflation rates may be unhelpful – they may involve different baskets of goods and likely exclude services. Further, some nominal FX changes, particularly those that are unexpected, may temporarily affect profits because businesses may have fixed-price obligations.

(III) Relevant Portion of FX Change

In cases that involve a point historical FX rate and thus lack a no-change band, the entire change in FX rates should affect the profits of the tested party. Where a no-change band applies, only a portion of the FX change affects tested-party profits. For example, if the no-change band is 90 to 110 yen to the dollar, a move to 80 yen to the dollar could be treated as a 10 percent move (*i.e.*, 20 percent from the median of the no-change band less the 10 percent within the no-change band); or an 11.1 percent move (*i.e.*, the move from the edge of the no-change band, or $(90-80)/90$). The first example is based on the assumption that an FX rate of 100 yen to the dollar is neutral as to profitability. The second example assumes that the prevailing historical FX rate is represented in the entire 90 to 110 range.

e. Determining How to Apply the Adjustment

Where the tested party is a U.S. distributor of a foreign manufacturer, one question is whether the FX Experience Adjustment should be made to the distributor’s gross margin or to the cost of goods it purchases from the foreign manufacturer. Most of the models the APA Program has seen involve adjustments to COGS, which seems appropriate since the basis for the FX Experience Adjustment is that FX changes alter the costs of the foreign manufacturer’s inputs. However, the APA Program has seen proposals to adjust gross margins. Below, we show a formula that gives the FX Experience Adjustment as a percentage change to COGS. The following exhibit illustrates how the adjustment can shrink if the same percentage is applied to gross margins:

Exhibit 15

Premise: FX has 10% impact on tested party			
	Unadjusted	GM Based Adjustment	COGS Based Adjustment
Sales	100	100	100
COGS	80	78	72
Gross Profit	20	22	28
Operating Expenses	18	18	18
Operating Profit	2	4	10
Gross Margin	20.0%	22.0%	28.0%
Operating Margin	2.0%	4.0%	10.0%

Past proposals to adjust gross margins on this basis were based on the view that an FX Experience Adjustment should not dramatically change the results of the applicable transfer pricing method.³⁶ The gross-margin adjustment typically is less than the COGS adjustment since gross profit typically is less than COGS. While this approach may better ensure that an adjustment improves the reliability of results, adjustments should be made to COGS where substantially complete data are available for the other four elements discussed above.³⁷

2. APA Program's Experience with FX Experience Adjustments

The APA Program has included FX Experience Adjustments in APAs involving the CPM and the RPSM. This section provides examples of how an FX Experience Adjustment may apply under those methods.

a. CPM

Several CPM-based APAs include FX Experience Adjustment provisions. Each APA involves a U.S. distributor and addresses only the effect of FX rate shifts on the dollar price of foreign inputs. Each of the provisions addresses the five elements discussed above and ultimately adjusts an operating-margin range for the impact of the FX change. In the following example of an FX Experience Adjustment provision, the tested party's COGS are adjusted for the impact of the FX change, then compared to the unadjusted operating-margin range provided by the comparable companies:

$$\text{Adjusted COGS} = \text{Reported COGS} / (1 + \text{Adjustment Factor})$$

Where

Adjusted COGS = the tested distributor's COGS, without reflecting the FX change

Reported COGS = the tested distributor's reported COGS, which reflects the FX change

Adjustment Factor = $(1 - \text{Pass-through\%}) * \text{Split\%} * \text{FXChange} * \text{FCInputs}$

Where

Pass-through% = percent of gain or loss passed through to unrelated parties

Split% = percent of related parties' FX gain or loss borne by tested distributor

FXChange = percentage change in exchange rates outside no-change band

FCInputs = foreign-currency-based inputs / total inputs

The following is an example where the foreign currency strengthens:

$$\text{Adjustment Factor} = (1 - 20\%) * 50\% * 10\% * 80\% = 1 + .032$$

If Reported COGS are 100, Adjusted COGS are 96.90 (i.e., $100 / (1 + .032)$)

³⁶ Other proposals that adjust gross margin provide the same outcome as proposals to adjust COGS. These proposals simply apply a different mathematical formula to achieve the same result.

³⁷ Where there is some uncertainty about an adjustment, making the adjustment smaller increases the probability that the adjusted amount is closer than the unadjusted amount to the arm's-length amount.

The tested party's results are recomputed based on a COGS of 96.90. If the recomputed results are within the CPM range, the tested distributor's transactions are arm's length.

b. RPSM

One APA that applies the RPSM includes an FX Experience Adjustment provision. The APA involves the U.S. distributor of a related foreign manufacturer. The RPSM splits residual profit 25/75, respectively. The FX Experience Adjustment splits exchange gain or loss 10/90.

The adjustment provision includes a no-change band. No adjustment is made if the average exchange rate for the APA year is within 10 percent of the average of the quarterly exchange rates for the three years preceding the APA year (*i.e.*, a floating base rate). If the exchange rate falls outside the no-change band, the U.S. distributor earns 10 percent of the exchange gain or loss rather than 25 percent. The basis for changing the split is that the foreign manufacturer is responsible for managing the combined companies' global FX risk.

The amount subject to the 10/90 split is the total price of goods that the U.S. distributor purchases from the related foreign manufacturer (after applying the RPSM) times the percentage change in the exchange rate beyond the no-change band. For example, if the foreign currency appreciates 20 percent against the U.S. dollar, the amount subject to the 10/90 split is 10 percent (20% - 10%) of the total purchase price that the U.S. distributor paid the foreign manufacturer. Basing the adjustment on 100 percent of the purchase price assumes that no portion of the cost or benefit of the currency fluctuation (outside the no-change band) is passed to customers or suppliers and that all of the foreign manufacturer's inputs are affected by the FX change.

IV. Considerations for FX Experience Adjustment Provisions

In summary, a proposal for an FX Experience Adjustment provision should consider the following items:

1. Determine whether the controlled parties expressly allocate FX risk, whether the tested party has the financial capacity to bear the allocated risk and whether the conduct of the parties is consistent with the allocation.
2. Identify all relevant exchange rates (*e.g.*, those that affect the prices of foreign-currency inputs of the tested party's related-party purchases).
3. Identify the affected inputs and sales for each relevant currency.
4. Determine the extent to which the taxpayer and related parties will pass the cost or benefit of FX changes through to unrelated parties.
5. Determine whether the applicable transfer pricing method, without an FX Experience Adjustment provision, properly allocates the FX gain or loss. If not, an FX Experience Adjustment provision may be appropriate.

6. If an FX Experience Adjustment is appropriate, measure the FX rate changes for which adjustments will be made. Establish a benchmark FX rate or range of rates that is neutral as to the tested party's profitability and compare that to the prevailing FX rate for the tested year. Consider use of a no-change band, a floating or static base rate, and an adjustment for differences in underlying inflation rates for the currencies, and determine the portion of relevant FX changes that will alter the tested party's prices or profits.
7. Determine how the FX Experience Adjustment provision should alter the results of the applicable transfer-pricing method. Should an adjustment be made to COGS, gross margin or some other indicator?

Addressing these items helps to ensure that a proposed FX Experience Adjustment provision improves the reliability of the results of the proposed transfer pricing method.

V. Issues to Consider When Evaluating FX Experience Adjustment Provisions

The APA Program will not agree to FX Experience Adjustment provisions for every case. This conclusion is based in large part on the difficulty in determining whether an adjustment actually improves the reliability of a method. The party proposing an FX Experience Adjustment provision must provide a persuasive case based on the guidelines in the preceding section.

The regulations stipulate that adjustments that improve the reliability of results should be made, and specifically mention FX as a financial risk that should be considered. FX risk takes many forms and can impose real costs on taxpayers. We discuss above how firms deal with FX risk in various ways, noting that no standard "arm's length" way exists to deal with FX risk in cross-border transactions, and that computational issues complicate the development of a general FX adjustment framework. In a typical case, therefore, it is difficult to quantify the impact of a change in exchange rates on a taxpayer and more difficult to determine the extent to which the taxpayer passes that cost or benefit through to other parties.

In addition, FX adjustments are not performed routinely like other adjustments (LIFO, asset intensity, etc.), which are more widely accepted as improving reliability. Summary PLI statistics, such as the median or inter-quartile range of comparable companies' results, may not be reliable because comparable companies' FX exposure, risk management strategies, and hedging policies can not usually be quantified from public databases or 10-K disclosures. Also, the time period for the comparable data likely does not match the period over which the FX risk is measured. Even if there is sufficient detail to ascertain how FX risk is allocated among unrelated parties (*e.g.*, inclusion of a formula to adjust the price for FX changes), the transacting parties may deal with residual FX risk through hedging or diversification strategies that can be difficult to detect. If hedging expenses can be identified, allocating these to a specific transaction may be difficult. The company's financial results may have been influenced by a combination of natural and synthetic FX risk strategies that cannot be tied to specific transactions.

³⁸ See §1.482-1(d).

³⁹ See §1.482-1(d)(3)(iii).

Some macroeconomic data are available regarding FX fluctuations and how they are passed through to ultimate product markets and split among parties in the value chain. But such macroeconomic data may not be conclusive where comparable transactions involve different mixes of currencies. Arm's length prices are also affected by elasticity of demand, industry concentration and level of competition, shipping, storage or switching costs, foreign competitors (with different FX exposures), and tax or regulatory circumstances. Pass-through analysis based on macroeconomic data thus ignores important variables and oversimplifies the impact of FX changes on prices or profits.

Finally, other policy complications exist regarding FX Experience Adjustments and APAs. The mechanisms are complex, require vast amounts of taxpayer information and, in some cases, require significant amounts of macroeconomic data and analysis. These efforts likely produce an adjustment mechanism that has a small impact on taxable income. A selection bias may also exist. Taxpayer may propose adjustments only if they face circumstances that make an adjustment mechanism desirable. These issues obscure a determination of whether the overall reliability of a TPM is improved by adding the adjustment.

Accordingly, making FX adjustments, including FX Experience Adjustments, in many cases will not improve the level of comparability between the tested party and the comparable companies and therefore will not improve the reliability of the transfer pricing method's results. In such cases, the APA Program will not agree to an FX Experience Adjustment provision.

Appendix 1
Examples of Financial, Translational and Transactional FX Risk

1. Example of Financial Risk

To see how financial FX risk can arise, consider the case of Acme Inc., a U.S. company that manufactures novelty products and sells them through unrelated distributors in Mexico, Japan, and the United States. Acme purchases materials and pays its workers in dollars. Additionally, it receives dollars when its sells to distributors. However, Acme holds cash balances to take care of incidental operating expenses. If these cash balances are denominated in dollars, there is no financial FX risk. However, if Acme decides to hold yen deposits instead of dollars because it thinks it can receive a higher return on its holdings, then the purchasing value of these deposits depends upon the yen-dollar exchange rate at the time of withdrawal.

Exhibit 16

	Balance at Jan. 1	Balance at Dec. 31	Balance at Dec. 31
Cash Deposit in Yen	Y10,000	Y10,500	Y10,050
Japanese Interest Rate	5%		
Exchange Rate (yen per dollar)	100	100	110
Cash Deposit after Conversion into Dollars	\$100.00	\$105.00	\$95.45
U.S. Interest Rate	4%		
Cash Deposit in Dollars	\$100.00	\$104.00	\$104.00

At the beginning of the year, Acme has a cash balance of \$100, which it then converts into yen-based deposits to earn 5 percent interest. After one year, Acme withdraws the yen to pay its expenses in dollars. The value of the deposit in dollars will depend upon the exchange rate at the time of withdrawal. If the exchange rate remains the same (100 yen per dollar) then it will receive a \$105 return on its deposit, which is higher than the \$104 Acme would have earned from dollar deposits. However, if the exchange rate changes to 110 yen per dollar, the dollar value of its deposits falls to \$95.45 even though Acme earned 5 percent on its yen deposit. This potential loss of dollar purchasing power represents financial FX risk. Given that Acme's revenue and costs are in dollars, it may avoid this risk by holding only dollar denominated assets.

2. Example of Translational Risk

In addition to financial risk, Acme may face translational risk. Historical values of financial statement items may not provide a close approximation to current market value when the denominating currency is unstable, because the FX rate in effect when the statement is converted is likely to be significantly different from the FX rates in effect when the accounts were booked.

For example, Acme is the primary supplier for unrelated distributors in Japan who have loans outstanding from Japanese banks. As evidence of their borrowers' ability to pay, the banks require that the distributors submit Acme's financials. Acme keeps its books in dollars, but the banks prefer to examine yen-equivalent financial statements since they are most familiar with similar Japanese novelty manufacturers.

Unexpected exchange rate changes can create distortions in Acme's balance sheets and income statements. Financial statements containing stock (point in time) variables are typically prepared by valuing most assets and liabilities at historical cost, with the remainder, equity, also being stated at historical value. The following table shows Acme's balance sheet.

Exhibit 17

	Jan. 1		Dec. 31	
Accounts Receivable	\$20,000	¥2,000,000	\$22,000	¥2,420,000
Inventory	\$30,000	¥3,000,000	\$31,000	¥3,410,000
Total Assets	\$50,000	¥5,000,000	\$53,000	¥5,830,000
Accounts Payable	\$20,000	¥2,000,000	\$23,000	¥2,530,000
Common Stock	\$30,000	¥3,000,000	\$30,000	¥3,300,000
Total Liability and Equity	\$50,000	¥5,000,000	\$53,000	¥5,830,000
Exchange Rate (yen per dollar)	100		110	

As the table shows, the book value of Acme's assets increased from \$50,000 to \$53,000, an increase of 6 percent, over the year. In terms of yen, total assets increased 16.6 percent. The difference between the dollar and yen results reflects the depreciation of the yen against the dollar over the twelve-month period.

There are similar measurement problems when converting Acme's income statements as the table below shows.

Exhibit 18

	Jan. 1	Dec. 31
Cost Incurred	\$10,000	
Revenue Received		\$12,000
Net Profit Earned		\$2,000
Exchange Rate (yen per dollar)	100	110
Net Profit in Yen Using Single Benchmark Exchange Rate	¥200,000	¥220,000
Profit Margin Using Single Benchmark Exchange Rate	16.7%	16.7%
Net Profit Using Jan 1. Exchange Rate for Cost and Dec. 31 Exchange Rate for Revenue		¥320,000
Profit Margin Both Benchmark Exchange Rates		24.24%

As the table shows, Acme incurred its production costs at the beginning of the year and didn't realize revenues until the end of the year. Thus, costs were incurred when the exchange rate was 100 yen/\$ and revenues received when it was 110 yen/\$. If the transactions are recorded in dollars, the net profit margin is 16.7 percent. If revenues and costs are translated into yen at either the beginning or end of the year, the profit margin remains 16.7 percent. However, if the income statement items are translated using the exchange rates that prevailed when booked (as if the yen were the functional currency), then the profit margin is 24.24 percent. The higher net profit margin includes gains and losses due to currency changes.

To mitigate the timing problem, a weighted average exchange rate is often used to convert revenues and costs. While this method reduces measurement errors related to exchange rate changes, it may not remove them entirely.

3. Example of Transactional or Commitment Risk

As Acme's operations expand, it sells to additional overseas distributors in Japan who prefer to pay for their purchases in yen instead of dollars. Given that Acme still pays its costs in dollars, it must convert these yen revenues into dollars before paying its workforce and suppliers. In addition, Acme and its distributors negotiate purchase prices prospectively every six months. Thus, there is opportunity for the exchange rate to vary from the time prices are negotiated or contracted and when they are paid. The timing gap can cause the price received to differ from the negotiated price; a transactional or commitment FX risk.

To continue the example, Acme agreed to sell 100 units to JapanCo Distribution on January 1 at a price of ¥2.00 per unit to be paid when the good are delivered on June 30. For JapanCo, the price in yen is known in advance. While the yen price is also predictable for Acme, the realized dollar price is not certain since the exchange rate may change by the delivery date. This can be seen in the following table.

Exhibit 19

	January 1	June 30	June 30
Negotiated Price	¥200	¥200	¥200
Exchange Rate (yen per dollar)	100	110	90
Negotiated Price in \$	\$2.00	\$1.80	\$2.22

If the exchange rate rises to 110 yen/\$ in six months, then Acme will only receive the equivalent of \$1.80 per unit sold to JapanCo. However, if the exchange rate falls to 90 yen/\$, then Acme will realize the higher dollar price of \$2.22 per unit.

Appendix 2

Financial Statement Presentation Issues

Several basic accounting conventions address use of multiple currencies. These conventions, and the differences between them and certain foreign accounting methods underpin Translational FX risk. Internally, firms may focus on mitigating economic FX exposures, but as such risks are communicated to outside stakeholders, accounting and translational risk considerations sometimes dominate their practices and concerns.⁴⁰ Further, the different types of currency risk intertwine, and the financial statements form a ‘common denominator’ in which they are quantified and expressed.

Under U.S. GAAP, all subsidiaries must designate a functional currency, which should be the “primary currency of the economic environment in which they generate and expend cash”.⁴¹ Financial statements are then translated from the subsidiaries’ functional currencies to the parent company’s functional currency, and the various line items are reflected as follows:

Exhibit 20

Item	Translation rate	Do FX changes impact earnings?	Comments
Revenues/expenses (income statement accounts)	Weighted average rate	Yes	Usually daily weighted average for period included in income statement.
Assets and liabilities (balance sheet accounts)	Current rate on balance sheet date	No	Changes in value (gains and losses) upon translation are not reflected in the parent’s income statement, but rather in the equity section of the balance sheet under a “cumulative translation adjustment” account.
Gains and losses on actual FX transactions	Actual realized rate	Yes	Transactions in subsidiary’s functional currency show up in parent company’s income statement, but not in subsidiary’s.

Note that for foreign subsidiaries with local functional currencies, FX gains (losses) will not appear in the income statement because they would not exist but for the translation event. Companies operating in highly inflationary economies must use the U.S. dollar as their functional currency under U.S. GAAP, which has the effect of passing FX gains (losses) through income on a current basis. Firms are understandably concerned about how translational FX risk affects their reported earnings and other financial statement measures, and these items receive considerable attention where hedging and risk management issues are concerned.

⁴⁰ Taxing authorities are another example of interested outside parties, and it is worth noting that many TPMs involve PLIs that are based on conventional accounting statements rather than economic profitability.

⁴¹ Description of accounting treatment taken from: Davis and Militello, Foreign Exchange Risk Management: A Survey of Corporate Practices, (1995), Financial Executives Research Foundation, pp. 37-45.