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Foreign Exchange Adjustment Under §482

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This article expresses the author's personal opinions and does not necessarily represent the views of Shearman & Sterling or the IRS.

In determining whether certain controlled and uncontrolled transactions are comparable, Regs. §1.482-1(d)(3)(iii) provides that a comparison of the relevant risks that would affect the prices or profits attributable to such transactions must be made.¹ The relevant risks set out by the regulations include financial risks, such as fluctuations in foreign exchange rates and interest rates. In addition, Regs. §1.482-1(d)(2) provides that if there are material differences between the controlled and uncontrolled transactions, adjustments must be made to account for the effect of such differences on prices or profits.²

¹ Except as otherwise noted, all references herein are to the U.S. Internal Revenue Code of 1986, as amended.

² Under the final §482 regulations, a material difference is one that would materially affect the measure of an arm's-length result under the method being applied. This legal standard appears to be more discretionary than the scientific standard of statistically significant difference between two or more magnitudes.

If, as is assumed below, uncontrolled comparable U.S. companies purchase and sell primarily in the U.S. domestic market, then the operating results of such domestic companies should be adjusted when they are compared to U.S. companies that primarily import goods from related foreign corporations or export goods to related foreign distributors. These cross-border purchase and sale transactions are ordinarily subject to foreign currency exchange rate risk when entered into by uncontrolled parties, while purely domestic U.S. purchase and sale transactions obviously are not. In recognition of these differences, the Internal Revenue Service has, both in audit and in advance pricing agreements, accepted a "foreign exchange adjustment" applied to the gross profit margin of each uncontrolled comparable company, because a significant movement in the exchange rate is expected to primarily affect the cost of goods sold of importers or the net sales of exporters.³

³ Ordinarily, foreign exchange movement does not affect items belonging to operating expenses, since such items are usually purchased in the domestic market, except for cases involving royalty or advertising payments. In this regard, it is important to ensure accounting consistency with respect to cost of goods sold before making an appropriate adjustment to GPM. For example, certain controlled manufacturers might absorb below-the-line expenses into the cost of goods sold, while others have substantial below-the-line expenses. In addition, foreign exchange risk would only affect the price paid for imported components of controlled manufacturers, which may be a small proportion of their cost of goods sold. In contrast, foreign exchange risk might have a significant effect on the cost of goods sold of controlled resellers that do not add substantial value to imported products.

This article sets forth a practical method for computing such a foreign exchange adjustment. While other

articles have discussed foreign exchange adjustment in general terms, without formulae, this article sets forth a tried method for computing such a foreign exchange adjustment. The method, which calculates a foreign exchange adjustment to the financial results of uncontrolled comparable companies, is demonstrated as applied to plausible conditions, such as when the relevant exchange rate is either below or above the specified historical range.

Foreign Exchange Adjustment

a. Assumptions

The foreign exchange adjustment method set forth is based upon the principle that uncontrolled comparable companies would attempt to reduce the uncertainty associated with foreign currency fluctuation by agreeing to share the risks associated with such fluctuations. In addition, the author assumes that uncontrolled comparable U.S. companies purchase property primarily in the domestic market, and do not have significant foreign exchange risks.

Further, it is assumed that the foreign-controlled U.S. company under review purchases property from the foreign parent abroad in the parent's currency, such as Japanese yen. As a result, the foreign-controlled U.S. company bears the additional risk that the U.S. dollar will fluctuate significantly. In this case, to improve the reliability of the arm's-length results pursuant to Regs. §1.482-1(e)(2), the gross profit margin of each uncontrolled comparable company must be adjusted such that it reflects the foreign currency risk exposure of the foreign-controlled U.S. company.

b. Adjustment Formula

The foreign exchange formula can be postulated as follows:

(1) Adjusted gross profit margin $(GPM)_i = GPM_i \times R^{-1}$, where $R = (1 + r)$, $r = \alpha \times (g - \bar{g})$, and the foreign exchange adjustment is made to all i ($i = 1$ to n (sample size)) uncontrolled comparable companies.

In the adjustment expression, α represents a foreign exchange pass-through (or risk sharing) coefficient, which is greater than or equal to zero but less than or equal to one; and $g = \ln(e_t / e_{t-1})$ represents the rate of change of the relevant exchange rate between two consecutive periods.⁴ Likewise, e_t represents the exchange rate in a specified period, say month, quarter, or year t ; e_{t-1} represents the same exchange rate in a previous period; and \bar{g} represents an appropriate historical or central value of the rates of change of the exchange rate.

⁴ Ordinarily, a rate of change is computed by using the standard formula $(e_t - e_{t-1}) / e_{t-1}$. This formula is appropriate only when the numerator is positive, *i.e.*, when variable e_t is increasing at point e_{t-1} . When the numerator is negative, the appropriate formula is $(e_t - e_{t-1}) / e_t$. Therefore, to avoid errors in computation when the magnitude examined is decreasing between two points, it is better to compute a rate of change using formula $g = \ln(e_t / e_{t-1})$. It is not difficult to show that these formulae are related to one another.

Historical Range

Under certain conditions, it may be reasonable to specify a historical range with respect to the rate of change of the appropriate exchange rate, and to apply the foreign exchange adjustment only during periods when the actual rate of change is outside this historical range. Otherwise such an adjustment would be required whenever the exchange rate fluctuates, even if the fluctuation is immaterial.⁵ For example, assume that the rates of change vary between -0.5% and 5.5% for a given time period, such as 10 years. Assume that the average variation (\bar{g}) during such period is 2.5%. Using this example, an adjustment would be made only when the actual rate of change is either below -0.5% or above 5.5%.

⁵ In any event, the IRS is unlikely to accept as reasonable an adjustment to the GPM of any uncontrolled comparable company exceeding two percentage points.

In practice, the IRS may require that the adjustment be made with respect to a "weighted difference" between the actual value of g in the relevant tax year(s) and an appropriate historical or central value \bar{g} . Therefore, the author sets forth the adjustment factor taking into account this weighted difference, *i.e.*, $r = \alpha \times (g - \bar{g})$, where α is interpreted, as suggested above, to be the weighting,

pass-through, or risk sharing factor.⁶

⁶ Depending on facts and circumstances, α may be positive, or zero, or negative.

Foreign Currency Appreciation

During a period when the foreign currency appreciates against the U.S. dollar outside its historical range of variations, the foreign-controlled U.S. company's cost of goods sold would increase, and its gross profit margin would decrease. In this case, it is necessary to make a downward adjustment to the gross profit margins of the uncontrolled comparable U.S. companies (because the uncontrolled comparables are not subject to foreign exchange risk).

Example 1 (Downward adjustment). Assume a case in which Jaco Electronics is considered to be comparable to a foreign-controlled U.S. company engaged in the distribution of computer systems. Assume, further, that Jaco's reported GPM equals 20.5%. Assume, furthermore, that $g = 13.0\%$, $\alpha = 2.5\%$, and because in a similar situation uncontrolled trading partners agreed to share foreign exchange risk equally, $\alpha = 0.5$. Therefore, applying foreign exchange adjustment formula (1), the results would be:

$$(1a) \text{ Adjusted GPM}_{\text{Jaco}} = 20.5\% \times 0.9501 = 19.5\%,$$

$$\text{where } r = 0.5 \times (0.13 - 0.025) = 0.0525, R = 1.0525, \text{ and } R^{-1} = 0.9501.$$

Foreign Currency Depreciation

During a period when the foreign currency depreciates against the U.S. dollar outside its historical range of variations, the foreign-controlled U.S. company's cost of goods sold would decrease, and its gross profit margin would increase. In this case, it is necessary to make an upward adjustment to the GPM of the uncontrolled comparable U.S. companies.

Example 2 (Upward adjustment). Assume the same facts and circumstances of Example 1, except that $g = -4.8\%$. Therefore, applying foreign exchange formula (1), the results would be:

$$(1b) \text{ Adjusted GPM}_{\text{Jaco}} = 20.5\% \times 1.0379 = 21.3\%,$$

$$\text{where } r = 0.5 \times (-0.048 - 0.025) = -0.0365, R = 0.9635, \text{ and } R^{-1} = 1.0379.$$

As a further illustration of the foreign exchange adjustment formula set out above, Exhibit 1 shows the annual movement including the trends and cycles of the U.S. dollar with respect to the Japanese yen from 1985 (time of the Plaza Accord)⁷ to 1994. Exhibit 2 shows the annual rate of change (g) of this exchange rate during the same period, and Exhibit 3 shows the adjusted GPM_{Jaco} with respect to successive annual values of g during the same period. Exhibit 3 shows that the foreign exchange adjustment method set forth in this article has both downward and upward effects on the gross profit margin, depending, *ceteris paribus*, on the value of the appropriate g in the tax year(s) under review.

⁷ For transfer pricing purposes, the first significant currency shock took place in 1985 when the United States and six other developed nations signed an accord resulting in a massive increase in the value of the Japanese yen and German mark in relation to the U.S. dollar. The agreement, called the Plaza Accord because it was signed in New York's Plaza Hotel, was the first of several government-orchestrated currency realignments that are causing §482 compliance problems today (3 *Transfer Pricing Report* 721, 2/15/95).

Determination of Risk Sharing Coefficient

Under general §482 principles, the foreign exchange risk sharing (or pass-through) coefficient, α , should be determined by reference to uncontrolled comparable values. However, when only industry data are available, it may be reasonable to find a proxy for α by using such methods as regression analysis.⁸

⁸ Formula (1) permits any plausible value for the risk sharing coefficient, such that $0 \leq \alpha \leq 1.0$. Depending on the relevant facts and circumstances, formula (1) must be modified if the U.S. related party is able to "pass through" all or a portion of the effect of the change in the exchange rate to its customers.

Example 3 (Regression analysis). The following regression results were obtained using annual data (1980-1993) with respect to the U.S. dollar per Japanese yen exchange rate:

$$(2) \ln p_t = 3.36 + 0.48 \ln e_t + 0.79 \ln m_t, \text{ Adj } R^2 = 95.3\%,$$

where $\ln p_t$ denotes the natural logarithm of a U.S. dollar-denominated (or contractual currency) Japanese-based price index for Electrical Machinery in year t ; $\ln e_t$ denotes the natural logarithm of the U.S. dollar per Japanese yen exchange rate in the same year; and $\ln m_t$ denotes the natural logarithm of a JPY-denominated Japanese-based price index for Electrical Machinery (as a proxy for Japanese cost plus profit) in the same year.⁹

⁹ Logarithm transformation is a standard way of linearizing exponential and power functions.

In this case, the foreign exchange pass-through coefficient is approximately equal to the average annual change in the U.S. dollar-denominated Japanese export prices with respect to the average annual change in the U.S. dollar per Japanese yen exchange rate during the period analyzed.¹⁰ These regression results suggest that if the U.S. dollar per Japanese yen exchange rate would change by 100%, the Japanese producer would be able to "pass through" approximately 48% of that change to the U.S.-based distributor. Therefore, during the 1980-1993 period, as an average in the Electrical Machinery industry, the Japanese producer absorbed approximately 52% of the burden of the Japanese yen appreciation with respect to the U.S. dollar.¹¹

¹⁰ In symbols, $\alpha = \delta \ln p_t / \delta \ln e_t = 0.48 \pm (r \times 0.06)$. This regression coefficient (α) is equivalent to the elasticity of the Japanese-based Electrical Machinery price with respect to the U.S. dollar per Japanese yen exchange rate. The number 0.06 represents the standard error of the regression coefficient, and r is an appropriate multiplier obtained from Student's t Distribution.

¹¹ As a final test of the reasonableness of this regression coefficient, note that this estimate is within a range of comparable results for α (from 0.42 to 0.53) obtained by other researchers. See P. Athukorala and J. Menon, "Pricing to Market Behavior and Exchange Rate Pass-Through in Japanese Exports," *Economic Journal*, March 1994, p. 276. In addition, I have reviewed at least two distribution contracts between unrelated entities involving Japan and U.S. cross-border transactions in the electromechanical industry with an $\alpha = 0.5$.

Exhibit 1.

Exhibit 2.

Conclusion

In circumstances involving cross-border transactions between controlled entities using different currencies, it is important to consider the effect of foreign exchange risk in measuring arm's-length prices. In such circumstances, the method set forth in this article can be used to compute the effect of foreign currency exchange risk on prices or profits. This foreign exchange adjustment method has multiple advantages: it conforms to the final transfer pricing regulations, it is practical, and is applicable both in periods of currency appreciation and depreciation. Therefore, once the risk sharing coefficient is determined, the taxpayer is left with the single challenge of establishing the historical range of variations of the appropriate exchange rate.

Exhibit 3: Foreign Exchange Adjusted GPM

Year	g	Adjstment Factor R	Adjusted GPM (GPM = 20.5%)
1985	-0.3%	0.9860	20.8%
1986	34.7%	1.1610	17.7%
1987	15.3%	1.0640	19.3%
1988	12.1%	1.0480	19.6%
1989	-7.5%	0.9500	21.6%
1990	-4.8%	0.9635	21.3%

1991	7.3%	1.0240	20.0%
1992	6.0%	1.0175	20.1%
1993	13.0%	1.0525	19.5%
1994	8.5%	1.0300	19.9%

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