Analysis

Lump-Sum Royalty Payments for Intangibles

L'acqua cho'io prendo già mai non si corse. (The waves I take were not sailed before.)
Dante Alighieri, *Paradiso*, II, 7-9.

By EDNALDO A. SILVA, PH.D.

The cross-border transfer of intangible property between related entities is subject to considerable tax complexity and uncertainty, and the burden of proof is usually borne by the taxpayer. In general, intangible property (including software code, chemical formulae, and trade names) is transferred by way of (i) a terminal sale for a lump-sum royalty payment; or (ii) a temporary license for periodic royalty payments.

This article provides two distinct methods for determining an arm's-length lump-sum royalty payment for the transfer of intangible property in a manner consistent with the arm's-length standard described in the Organisation for Economic Co-operation and Development (OECD) guidelines and the Internal Revenue Service's Section 482 transfer pricing regulations.[1]

Lump-Sum Royalty

According to Regs. § 1.482-4(f)(5), an arm's-length lump-sum royalty payment is a permissible method of satisfying the U.S. "commensurate with income" standard applicable to the transfer of intangibles among related parties. A lump-sum royalty payment is also one of the specified forms of consideration in the cost sharing regulations for a buy-in or a buy-out valuation to be made in connection with the entry, restructuring, or termination of a cost sharing arrangement.[2]

---

[1] OECD, *Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations* (Paris, 1995); Chapter VI. The appropriate U.S. transfer pricing regulations will be cited in context below. The term "intangible property" (or "intangibles") includes certain business rights to use commercially developed assets such as patents, trademarks, trade names, designs, or models. Intangibles may be valuable even if they do not have accounting or book value in the company's balance sheet. *See* Regs. § 1.482-4(b).

[2] *See* OECD guidelines, ¶8.31, and Regs. § 1.482-7(g)(7)(i). Under the OECD guidelines, in contrast to the U.S. transfer

Ednaldo A. Silva, former senior economic adviser at the Internal Revenue Service Office of the Chief Counsel, participated in the drafting of the temporary and final Section 482 regulations. He currently is the head of Silva Analytics Inc. in Bethesda, Md.

In such instances, the transferor must report in the taxable year in which the intangible is transferred an "equivalent royalty amount," which is defined as a lump-sum equivalent to an advance payment of a stream of royalty payments over the life of the intangible. Regs. § 1.482-4(f)(5)(i) provides that the determination of an equivalent royalty amount requires a "present value calculation based on ... an appropriate discount rate, and the projected sales over the relevant period."

Using symbols, the equivalent royalty payment can be determined as follows:

(1) $L_0 = \rho V_0$,

where $V_0 = \Sigma \hat{S}_\tau (1 + \pi)^{-\tau}$ is the present value of projected sales, and $\tau = 1$ to T years.

Above, $\hat{S}_\tau$ denotes the projected sales associated with the acquired intangible, ρ denotes a comparable (or arm's-length) royalty rate, π denotes a comparable discount rate, and T is the useful life of the intangible being transferred.[3]

A typical present value calculation requires a prior knowledge of $\hat{S}_\tau$, π and T. In the general case of formula (1) above, the taxpayer must also have a prior knowledge of ρ, a comparable royalty rate, in order to determine the appropriate lump-sum royalty payment.[4]

In general, sales cannot be reliably projected over a long period of time, except perhaps for public utilities. Therefore, in the particular case when the useful life of the intangible property being transferred is sufficiently long (*e.g.*, 15 years or more), a truncated valuation formula can be used:[5]

(2) $L_0 = \rho W_0$,

where $W_0 = S_0 [(1 + \pi) / (\pi - g)]$ is the present value of projected sales, and $\pi - g > 0$.

---

pricing regulations, a cost sharing arrangement is not limited to activities related to the research and development of intangible property; such arrangements may include tangible property and the provision of services. *See* OECD guidelines, ¶8.7.

[3] The "equivalent royalty" amount for each year is determined by $L_\tau = \rho \hat{S}_\tau$. The equivalent royalty amount is subject to periodic adjustments under Regs. § 1.482-4(f)(2).

[4] In a prior article, the author described a practical method of determining an arm's-length royalty rate in the pharmaceutical industry. *See* "Royalty Rates in the Pharmaceutical Industry," 6 *Transfer Pricing Report*, 702, 1/28/98. Royalty rates ranged from 5 percent to 10 percent, with an interquartile range from 6.5 percent to 8.0 percent.

[5] The nomenclature here is designed to aid memory; thus, L = lump sum, V = value, W = worth, etc.

Above, g denotes an expected growth rate in sales of the property incorporating the acquired intangible, and S_0 denotes actual sales in the initial year exploiting the intangible.[6]

When T involves an indefinite period (such as a case involving a perpetual royalty license), truncated formula (2) may be preferable to formula (1), because the taxpayer must estimate only g, thus avoiding unreliable sales forecasts into the distant future.

Periodic Adjustment Test

As described above, the valuation of intangibles is straightforward (with the possible exception of determining ρ). However, the IRS requires that projected sales be tested periodically for a specified tolerance or forecasting error.[7] Therefore, the author provides a periodic adjustment test for determining the arm's-length character of a lump-sum royalty payment subject to a regulatory "periodic adjustment" rule:

(3) $| \, (\hat{S}_\tau - S_\tau) \, / \, S_\tau \, | \le \alpha,$

where the parameter α denotes a relative margin of error permitted by regulation, and the variable S_τ denotes actual sales in period τ.[8] Regs. § 1.482-4(f)(2)(ii)(B)(6) and § 1.482-4(f)(2)(ii)(C)(4) require that $\alpha \le 0.2$ (or 20 percent).[9]

In this context, the OECD guidelines provide:

---

[6] Formula (2) is derived in the appendix below.

[7] *See* Regs. § 1.482-4(f)(2)(i) (periodic adjustments). Requiring a reasonableness test at the time of the intangible transfer is sensible, because in practice financial projections are usually presented without regard to forecasting errors.

[8] Formula (3) is derived using the assumption that both the actual and forecasted sales of the product incorporating the intangible are definite or bound. In matters subject to less discretion, a 10-percent forecasting error or tolerance is customary. Note that if there are no sales during year τ (such that $S_\tau = 0$), the portmanteau test is indefinite.

[9] *See also* Regs. § 1.482-7(f)(3)(iv)(B), which discuss unreliable projections, for a comparable rule under a qualified cost sharing arrangement. Uncontrolled parties (as willing buyers and willing sellers) would hardly accept a lump-sum royalty subject to periodic adjustments, as required in Regs. § 1.482-4(f)(2)(i):

> If an intangible is transferred under an arrangement that covers more than one year, the consideration charged in each taxable year may be adjusted to ensure that it is commensurate with the income attributable to the intangible . . . In determining whether to make such adjustments in the taxable year under examination, the district director may consider all relevant facts and circumstances throughout the period the intangible is used.

The author's experience suggests that during a typical arm's-length transaction involving valuation, willing parties attempt to determine reliable projections and a good estimate of the discount rate. In this regard, it is difficult to imagine purchasing tangible or intangible property in which the price could be adjusted up to five years later. The OECD guidelines do not endorse a periodic adjustment rule. However, when independent parties would have insisted on a price adjustment clause in comparable circumstances, the OECD guidelines permit a tax administration to impute such a clause. *See* OECD guidelines, ¶6.34.

It is recognized that tax administrations may not be able to conduct an audit of a taxpayer's return until several years after it has been filed. In such a case, a tax administration would be entitled to adjust the amount of consideration with respect to all open years up to the time when audit takes place, on the basis of the information the independent enterprises would have used in comparable circumstances to the pricing.

According to U.S. transfer pricing regulations, the taxpayer may not be subject to a Section 482 adjustment if the relative error in forecasting sales is less than α (as noted above, $\alpha \le 20$ percent) for any taxable year under audit.

As a result of the periodic adjustment rule, the transferor cannot be either frugal or profligate with sales projections associated with the intercompany transfer of intangibles. Rather, the transferor must establish the reliability of the reported lump-sum royalty. If the forecasting error in any applicable tax year exceeds the regulatory threshold and the taxpayer does not adjust the consideration to an arm's-length amount, the transaction may be subject to accuracy-related penalties under Section 6662.

Examples

Regs. § 1.482-4(f)(5)(iii) provides an important example of calculating a lump-sum royalty payment, which is replicated here using the formulae described above. For this purpose, consider a U.S. parent that grants a license to a foreign subsidiary for the right to produce and distribute a patented product in a foreign territory. The license is for a period of five years, and the subsidiary makes a single lump-sum royalty payment of $500,000 at the beginning of the license agreement.

As guidance, the regulations provide that "The equivalent royalty amount for this license is determined by deriving an equivalent royalty rate equal to the lump-sum [royalty] payment divided by the present discounted value of the [foreign subsidiary's] projected sales of [the patented product] over the life of the license."[10]

As in the regulatory example cited above, the author assumes that the sales forecasts associated with the intangible being transferred are $\hat{S}_1 = \$2.5$ million; $\hat{S}_2 = \$2.6$ million; $\hat{S}_3 = \$2.7$ million; $\hat{S}_4 = 2.7$ million; and $\hat{S}_5 = \$2.75$ million. Likewise, the discount rate is assumed to be $\pi = 0.10$ (or 10 percent) and the comparable royalty rate is assumed to be $\rho = 0.05$ (or 5 percent).[11]

Example 1: Using the information above, the author obtained:

$L_0 = 0.05 \, \Sigma \, \hat{S}_\tau \, (1.10)^{-\tau}$, where $\tau = 1, 2, \ldots, 5$; or

$L_0 = 0.05 \, (\$10.0 \text{ million})$; or

$L_0 = \$0.5$ million; or $\$500,000$.

As a result, the taxpayer would conclude that the single lump-sum royalty payment of $500,000 was arm's length. See Exhibit 1.

---

[10] Regs. § 1.482-4(f)(5)(iii), *Example (ii)*.

[11] The regulatory example means to derive $\rho = 0.05$; but, in fact, this royalty rate is presumed and not derived. As demonstrated in formulae (1) and (2) above, estimating a lump-sum royalty equivalent depends on prior knowledge of a comparable royalty rate. Therefore, the royalty rate cannot be derived from the lump-sum amount, as suggested in this regulatory example.

Exhibit 1					
Discounted Sales Valuation for an Intangible Property					
($ million, except as noted)					
$\pi = 10.0\%$					
	Next Year	2	3	4	5	Lump-Sum
Projected Sales	$2.500	$2.600	$2.700	$2.700	$2.750	$13.250
Present value of projected sales	$2.273	$2.149	$2.029	$1.844	$1.708	$10.002
Royalty rate, or ρ						5.0%
Lump-sum value of the intangible						$ 0.500

Example 2: For the purpose of applying formula (2), the author assumes that the useful life of the intangible is indefinite.[12] The author also assumes that the growth rate of sales is $g = 0.025$ (or 2.5 percent), and determined that the initial sales are $S_0 = \$2.44$ million. Using this additional information, the author obtained:

$L_0 = 0.05$ [$2.44 million (1.10 / 0.075)],

$L_0 = 0.05$ [$2.44 million (14.7)]; or

$L_0 = 0.05$ ($35.787 million); or

$L_0 = \$1.789$ million.

As shown above, the foreign subsidiary would have to pay a lump-sum royalty of $1.789 million if the intercompany licensing agreement is extended indefinitely (or if the agreement includes an "evergreen" renewal clause). See Exhibit 2.

Exhibit 2	
Discounted Sales Valuation for an Intangible Property	
($ million, except as noted)	
Expected growth rate of sales, or g	2.5%
Discount rate, or π	10.0%
Multiplier $(1 + \pi) / (\pi - g)$	14.7
Initial sales of the acquirer of the intangible	$2.440
Present value of projected sales	$35.787
Royalty rate, or ρ	5.0%
Lump-sum value of intangible property	$1.789

Example 3: In the above example, a U.S. parent licensed an intangible to a foreign subsidiary for a lump-sum royalty payment. Therefore, suppose that in any taxable year up to five years after the initial license, the difference between actual and forecasted sales divided by actual sales exceeds 20 percent. In such a case, the U.S. parent would be subject to a tax adjustment to bring the original royalty consideration in conformity with the "commensurate with income" provision of the U.S. transfer pricing regulations.

---

[12] Exhibit C of my article cited above in footnote 4 contains important information regarding the duration of licensing arrangements in the pharmaceutical industry. The duration included 10, 15, or 20 years, or until expiration of applicable patents, and perpetual arrangements.

As above, the commensurate with income value for the intangible may be determined by formula (1) or (2) above, or by any other acceptable valuation method not included in this article.

Sensitivity Analysis

In general, present value calculations are very sensitive to variations in the discount rate. This vagary can be a significant cause for controversy between the taxpayer and the tax authorities.

The following sensitivity analysis shows the change in the present value of projected sales in response to variations in the discount rate. For example, varying the discount rate (up or down from a given rate) by 20 percent produces a substantial change in the present (or discounted) value of projected sales. As a result, the value of the intangible property being transferred also changes. Under the assumed facts of Example 1, when the discount rate is $\pi = 8$ percent, ceteris paribus, the present value of the projected sales is $V_0 = \$10.543$ million. However, when the discount rate is increased to $\pi = 12$ percent, the present value of projected sales is decreased to $V_0 = \$9.503$ million.[13] See Exhibit 3. In general, present value is inversely related to the discount rate.

Enhancement to the Intangible

The U.S. periodic adjustment rule may be inconsistent with the so-called "cheese example" of Regs. § 1.482-4(f)(3)(iv), because a forecasting error of more than 20 percent can arise from certain marketing intangibles contributed by the acquirer of the property in the foreign territory. In such a case, the excess sales over the forecast may be attributed to a new owner (or licensee) that added significant value to the intangible property, and any imputed tax adjustment would be a misreading of the principles and facts involved.

Conclusion

In summary, taxpayers may select from two alternative methods of determining an arm's length lump-sum royalty payment for the cross-border transfer of intan-

---

[13] In each case, the lump-sum royalty payment represents a fixed proportion (e.g., ρ = 0.05) of the present value of the projected sales.

gible property among related parties. The canonical method, postulated as formula (1), requires multiple-year sales forecasts, which are then discounted to a present value by a comparable discount rate. The truncated method, derived in the Appendix as formula (2), is equivalent to a valuation based on earnings multiples, and does not require multiple-year sales forecasts; rather, the initial sales are discounted to a present value by applying multiples reflecting the discount rate of comparable firms.

In addition the author introduced a safe harbor test for determining if the taxpayer is subject to a periodic adjustment under the U.S. regulations.

Three examples drawn from the U.S. transfer pricing regulations, restated in a form consistent with formulae (1) and (2), illustrate the methods proposed in the article. However, taxpayers should understand that the examples in the transfer pricing regulations implicitly assume that a comparable arm's-length royalty rate has already been determined.

Appendix

The purpose of this appendix is to derive the truncated valuation formula (2). For this purpose, the author assumes that the initial sales of the intangible's acquirer will grow at a constant rate g per year into the indefinite future. The author assumes also that $\pi > g$, which implies that the comparable discount rate must be greater than the expected growth rate of sales. Therefore, the stream of projected sales and its present value can be represented by the following symbols:

(A1) $W_0 = S_0 + \lambda S_0 + \lambda^2 S_0 + \lambda^3 S_0 + $ *ad infinitum*; or simply:

(A2) $W_0 = S_0 (1 + \lambda + \lambda^2 + \lambda^3 + \dots)$, where

(A3) $\lambda = (1 + g) / (1 + \pi)$.

Using (A3), it is easy to check that if $\pi > g$, then $\lambda < 1$.

When $\lambda < 1$ is satisfied, one can use a well-known series expansion to obtain a simple formula for the present value of expected sales:

(A4) $W_0 = S_0 (1 - \lambda)^{-1}$,

because when $\lambda < 1$, the initial sales multiplier $(1 - \lambda)^{-1} = (1 + \lambda + \lambda^2 + \lambda^3 + \dots)$.[14]

Substituting (A3) into (A4), and multiplying the result by $(1 + \pi) / (1 + \pi)$, the author obtains the present value component of formula (2):

(A5) $W_0 = S_0 [(1 + \pi) / (\pi - g)]$,

where $\pi - g > 0$.

Taking a fraction (denoted by a comparable royalty rate) from the result above, one obtains a truncated method to determine an equivalent royalty amount:[15]

(A6) $L_0 = \rho W_0$,

which   is   formula   (2)   in   the   article.

---

[14] Several references can be given for this geometric series and its equivalent expression, including G. Dahlquist and Å. Bjöck, *Numerical Methods* (Prentice-Hall, 1974), p. 66 (equation 3.1.4).

[15] Formula (A5) is similar to Gordon's capital stock valuation formula, but it is not identical because the numerator of the multiplier is different. The multiplier in Gordon's formula is $(1 + g) / (\pi - g)$. *See* S. Benninga and O. Sarig, *Corporate Finance* (McGraw-Hill, 1997), p. 9 (equation 1.10) regarding the Gordon formula. The Gordon formula is the only valuation method reviewed in R. Clark, *Corporate Law* (Little, Brown, 1986), Appendix B (Valuation).

Exhibit 3 - Sensitivity Analysis
Present Value of Projected Sales as a Function of the Discount Rate
($ million, except as noted)

| | Year | | | | | Lump-Sum |
	1	2	3	4	5	Amount
Projected sales	$2.500	$2.600	$2.700	$2.700	$2.750	$13.250

Discount Rate	Present Value of Projected Sales Using Formula (1)
8.0%	$10.543
9.0%	$10.267
10.0%	$10.000
11.0%	$9.747
12.0%	$9.503

Present Value of Projected Sales