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DETERMINANTS OF THE COMPETITIVE POSITION OF INTERMEDIARY-LESSORS

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Abstract

It has been argued that the investment tax credit (*ITC*) is the primary reason for the emergence and survival of financial intermediaries as lessors. This paper examines why intermediary-lessors continue to exist despite the repeal of this credit by the 1986 Tax Reform Act. Four factors unrelated to the *ITC* are shown to impact the competitive position of the intermediary-lessor. The results of the analysis indicate the conditions under which these intermediary-lessors would prevail in equilibrium.

INTRODUCTION

Tax laws and other institutional features of the U.S. economy are often largely responsible for the emergence or coexistence of different types of firms within an industry. In the leasing industry, the lessors could be manufacturers or financial intermediaries such as banks and independent leasing companies. When a manufacturer is the lessor, the arrangement has been called direct leasing and the lessor a direct lessor. Indirect leasing involves an intermediary purchasing the asset from the manufacturer or a distributor and then leasing it to the lessee [2].

To finance the purchase of the asset, a lessor may choose a leveraged lease arrangement whereby a lender or consortium of lenders provide the lessor with a nonrecourse loan of up to 80 percent of the leased asset's purchase price. The lessor assigns the lease payments to the lender (or a trustee) and the lender holds a first mortgage on the asset. The lessor invests the remainder of the asset's purchase price and is the equity participant in the lease arrangement. While leveraged leases are common in indirect leasing, there is nothing to prevent a direct lessor from likewise entering into a leveraged lease arrangement.

Several papers have investigated the comparative advantages between direct leasing and indirect leasing. Miller and Upton [5] pointed out that manufacturer-lessors should dominate the lessor market. Smith and Wakeman [7], on the other hand, argue that neither the manufacturer nor the intermediary has a clearcut comparative advantage. Recently, Brick, Fung, and Subrahmanyam [2] examine the conditions under which indirect lessors could exist. They concluded that "without the investment tax credit, direct leasing prevails in equilibrium.....the existence of the *ITC* is largely responsible for indirect leasing, or the emergence of leasing intermediaries." [2, p. 58] They added that financial intermediaries enjoy a net tax advantage only in periods where interest rates are sufficiently low and a significant investment tax credit is available, and at higher interest rate levels, direct lessors should dominate the lessor market. [2, p. 58]

Although the investment tax credit was eliminated by the 1986 Tax Reform Act, contrary to the implications of previous researchers, financial intermediaries continue to exist in the leasing industry. Indirect leasing accounted for over 35 percent of the total value of new assets leased in 1987 [1]. Moreover,although leveraged lease arrangements were and still are prevalent (about 28 percent of the value of all new assets leased in 1987 involved leveraged leasing [1]), none of the studies mentioned above includes leveraged leasing in their analyses. The purpose of this paper is to reexamine the competition in the lessor market. This paper differs from previous studies in two major aspects. First, it includes both unleveraged and leveraged leasing. Second, the analysis is under the

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1986 Tax Reform Act environment which does not include an Investment Tax Credit (*ITC*) that, according to previous researchers, is the major reason for the existence of indirect lessors.

To assess lessor competitiveness, the next section presents the minimum lease payments required by four categories of lessors: (1) a manufacturer participating in an unleveraged lease (direct unleveraged lessor), (2) a manufacturer engaging in a leveraged lease (direct leveraged lessor), (3) a financial intermediary participating in an unleveraged lease (indirect unleveraged lessor), and (4) a financial intermediary engaging in a leveraged lease (indirect leveraged lessor). (See Table 1.) An unleveraged lessor (categories 1 and 3), as defined in this paper, should not be construed as an all-equity firm. Rather, unlike a leveraged lessor, an unleveraged lessor does not incur new debt using the leased asset as collateral to finance the purchase of that asset. Two primary advantages that certain lessor categories have over the others are identified, explained, and measured. These two advantages are then used to evaluate the relative competitiveness among the lessors. A summary and conclusions are in the final section.

TABLE 1
Four Categories Of Lessors

	Unleveraged Lease	**Leveraged Lease**
Manufacturer	Direct Unleveraged Lessor	Direct Leveraged Lessor
Intermediary	Indirect Unleveraged Lessor	Indirect Leveraged Lessor

LESSORS' REQUIRED MINIMUM LEASE PAYMENTS

In a competitive market, *ceteris paribus*, the lessor that charges the least will be the most competitive. For a given required rate of return, the minimum periodic lease charge required by the lessor is that amount that will result in a zero net present value for the lessor's investment or that will make the lessor's initial after-tax net cash outflow equal to the present values of the subsequent after-tax net cash inflows. Our analysis is subject to the following assumptions: (1) The lessee will bear the operating costs such as maintenance expense, insurance premium, and property tax on the leased asset; (2) The lease payments are assumed constant and made annually at the end of each year; (3) Lessors as well as lenders in a leveraged lease arrangement are incorporated and have the same marginal tax rate; (corporations presently dominate this industry [1]) (4) The required after-tax rate of return on the lease investment is project-specific rather than lessor-specific. That is to say, for the same leasing investment opportunity, the required yield is the same for all lessors. This assumption will be discussed in a later section.

Manufacturer-Lessor In An Unleveraged Lease (Direct Unleveraged Lessor)

Many equipment manufacturers lease rather than sell their products to the ultimate users. The minimum annual lease payment (*MALP*) charged by these lessors, L_1, would provide the same present value of after-tax cash flows as would sale of the asset and is given by:

Equation 1

$$P - t(P - C) = L_1(1 - t)PVIFA_{k,n} + \sum_{j=1}^{n}(td_jC)PVIF_{k,j} + [S - t(S - B_d)]PVIF_{k,n}$$

or,

Equation 2

$$L_1 = \{P - t(P - C) - \sum_{j=1}^{n}(td_jC)PVIF_{k,j} - [S - t(S - B_d)]PVIF_{k,n}\} / [(1 - t)PVIFA_{k,n}]$$

where:

P = Sales price of the equipment
C = Production cost of the equipment
S = Estimated salvage value of the equipment at the end of the lease period
B_d = Book value of the equipment to the manufacturer at the end of the lease period
t = Corporate marginal tax rate
k = Required after-tax rate of return on the lease
n = Lease period in years
d_j = Proportion of the asset's depreciable base to be depreciated in year j. (The values of d_j are specified by the tax laws.)

$$PVIFA_{k,n} = \sum_{j=1}^{n} (1+k)^{-j}$$

$$PVIF_{k,j} = \sum_{j=1}^{n} (1+k)^{-j}$$

The left-hand-side of Equation (1) is the lessor's "opportunity cost" or investment. By leasing rather than selling the asset to the ultimate user, the manufacturer forgoes the after-tax sale proceeds, *P - t(P - C)*, at the end of year 0 in exchange for a stream of cash flows associated with the lease investment. The first term on the right-hand-side of Equation (1) gives the present value of the after-tax lease payments from the lessee. The second term is the present value of the depreciation tax shields to the lessor. Tax laws specify that the depreciation base for a manufacturer-lessor is the cost of producing the asset leased rather than the asset's sale price. Therefore, the year j depreciation on the asset is d_jC. The third term in Equation (1) represents the present value of the after-tax proceeds from the sale of the asset at the end of the lease period.

Manufacturer-Lessor In A Leveraged Lease (Direct Leveraged Lessor)

The manufacturer-lessor may choose to enter into a leveraged lease. The *MALP* would then be L_2 given by:

Equation 3

$$P - t(P - C) - \theta P = L_2(1-t)PVIFA_{k,n} + \sum_{j=1}^{n} (td_jC + tI_j - D)PVIF_{k,j} + [S - t(S - B_d)]PVIF_{k,n}$$

or,

Equation 4

$$L_2 = \{(1-\theta)P - t(P - C) - \sum_{j=1}^{n} (td_jC + tI_j - D)PVIF_{k,j} - [S - t(S - B_d)]PVIF_{k,n}\} / [(1-t)PVIFA_{k,n}$$ where:

θP = Amount borrowed by the manufacturer-lessor to finance the asset
$0 < \theta \leq .80$ (Tax laws restrict θ to not more than .80.[1])
I_j = Interest paid in year j
D = Constant annual loan payment

In this case, the lessor's investment or equity participation, shown on the left-hand side of Equation (3), is the "opportunity cost" of leasing rather than selling the asset less the amount borrowed. As a borrower, the lessor incurs annual constant loan payment D with interest tax savings of tI_j in year *j*. The present values of these two

cash flow streams, together with the present values of the depreciation tax shields are shown in the second term of the right-hand-side of Equation (3). The first and third terms of Equation (3) are, respectively, the present values of the after-tax lease payments from the lessee and the present value of the asset's after-tax salvage value.

Financial Intermediary As Lessor In An Unleveraged Lease (Indirect Unleveraged Lessor)

The *MALP* required by a financial intermediary-lessor in an unleveraged lease can be obtained by solving the following equation for L_3:

Equation 5

$$P = L_3(1-t)PVIFA_{k,n} + \sum_{j=1}^{n}(td_j P)PVIF_{k,j} + [S - t(S - B_i)]PVIF_{k,n}$$

or,

Equation 6

$$L_3 = (P - \sum_{j=1}^{n}(td_j P)PVIF_{k,j} - [S - t(S - B_i)]PVIF_{k,n}\} / [(1-t)PVIFA_{k,n}]$$

where:

B_i= Book value of the asset to the intermediary at the end of the lease period

Equation (5) is similar to Equation (1) except that, in this case, the lessor's initial investment is the asset's purchase price P on the left side of Equation (5). Also, unlike the manufacturer-lessor, the intermediary is allowed to depreciate the full purchase price of the asset and realize a tax shield of td_jP in year j.

Financial Intermediary As Lessor In A Leveraged Lease (Indirect Leveraged Lessor)

The financial intermediary also has the option of being a leveraged lessor. Unlike the manufacturer-lessor, the intermediary's equity participation in a leveraged lease is the difference between the asset's purchase price, P, and the loan amount, θP.

The *MALP* required by an intermediary-lessor in this case can be obtained by solving the following equation for L_4:

Equation 7

$$(1-\theta)P = L_4(1-t)PVIFA_{k,n} + \sum_{j=1}^{n}(td_j P + tI_j - D)PVIF_{k,j} + [S - t(S - B_i)]PVIF_{k,n}$$

or,

Equation 8

$$L_4 = \{(1-\theta)P - \sum_{j=1}^{n}(td_j P + tI_j - D)PVIF_{k,j} - [S - t(S - B_i)]PVIF_{k,n}\} / [(1-t)PVIFA_{k,n}]$$

where:

θP = Amount borrowed by the intermediary-lessor to finance the asset, and $0 < \theta \leq .8$.

In each of Equations (1), (3), (5), and (7), there are several different cash flow streams to be discounted, with the degree of risk possibly varying between them. For example, in the case of an indirect leveraged lessor

(Equation (7)), the depreciation and interest tax shields are probably more certain than the salvage value. But these tax shields are not without risk either. Tax rates could be changed by Congress and taxable income must be positive and large enough to fully utilize these tax shields. Even if the lessor can carry the tax shields forward and use them in future years, their present values are reduced. On balance, the case for using different discount rates for different cash flow streams is not strong enough to justify the additional complications that this would introduce into our analysis. Indeed, the conventional approach has been to apply a single discount rate to all cash flows in a lease [2,3,6].

A related issue is whether or not all four types of lessors should have the same after-tax required rate of return or discount rate on the same lease project. Myers, Dill, and Bautista [6] show that the discount rate used by the lessor should be the lessor's weighted average cost of capital and thus will vary from lessor to lessor. Lewellen, Long, and McConnell [4], on the other hand, argue that the capitalization or discount rates used for valuing cash flow streams should not be firm-specific in a rational securities market. This implies that the required rate of return on a given lease project should be the same regardless of who the lessor is. In this paper, the required rate of return is assumed to be project-specific rather than firm-specific and is independent of the financing method used. Hence, the same discount rate, k, is used for all types of lessors and, as noted in the previous paragraph, for all cash flow streams. For essentially the same reason, the lender's required after-tax return and hence the interest rate charged on the loan, should be independent of the lessor-borrower given that the loan is secured by a lien on the leased asset and the lender has prior claim to the lease payments.

Another issue is the relationship between the required after-tax rate of return of the leveraged lessor and that of the lender. Since the lender has first claim to the lease payments and a mortgage on the leased asset, and, furthermore, the lessor has invested in the asset (equity participation), the risk to the lender should be less than that to the lessor. Consequently, the after-tax rate of return the lender requires on the loan should be lower than the lessor's required yield on the lease investment. This is a critical element of the "leverage advantage" to be discussed in the next section.

LEVERAGE ADVANTAGE AND MANUFACTURER'S ADVANTAGE

The relative competitiveness between any two of the four lessor categories—direct unleveraged lessor, direct leveraged lessor, indirect unleveraged lessor, and indirect leveraged lessor—can be determined by comparing the *MALP*s charged by them. The lower the *MALP*, the more competitive is the lessor. To facilitate this comparison, the advantages (or disadvantages) of the most significant attributes that distinguish the four lessor types from one another are identified and measured. Clearly, the most important characteristics that separate these lessor categories are whether a lessor is in a leveraged or an unleveraged lease and whether the lessor is a manufacturer or an intermediary. Thus the leverage advantage and the manufacturer's advantage are the key determinants of relative competitiveness.

Leverage Advantage

The leveraged advantage, denoted by α, can be measured by the difference between the *MALP* charged by the manufacturer in an unleveraged lease (L_1) and that in a leveraged lease (L_2).[2] Subtracting Equation (4) from Equation (2), we have:

Equation 9

$$L_1 - L_2 = \alpha$$

where:

$$\alpha = [\theta P - \sum_{j=1}^{n} (D - tI_j) PVIF_{k,j}] / [(1-t) PVIFA_{k,n}]$$

θP is the loan amount and therefore equals the present value of the after-tax net cash flows to the lender, discounted at the lender's required after-tax yield. That is:

Equation 10

$$\theta P = \sum_{j=1}^{n} (D - tI_j) PVIF_{r(1-t),j}$$

where *r* is the interest rate charged by the lender and t is the lender's marginal tax rate. Substituting Equation (10) into (9) yields:

Equation 11

$$\alpha = \sum_{j=1}^{n} (D - tI_j)(PVIF_{r(1-t),j} - PVIF_{k,j}) / [(1-t)PVIFA_{k,n}]$$

In Equation (11), the expression in the first parenthesis of the numerator is clearly positive because the annual loan payment (D) has to exceed the interest tax savings (tI_j). The denominator is positive since the tax rate is less than one. Thus:

Equation 12

$$k \gtrless 0 \quad \text{if} \quad PVIF_{r(1-t),j} \gtrless PVIF_{k,j}$$

Since *r(1-t)* and *k* are the discount rates, statement (12) is equivalent to the following:

Equation 13

$$\alpha \lessgtr 0 \quad \text{if} \quad r(1-t) \gtrless k$$

As discussed in the preceding section, the lender's risk is lower than the leveraged lessor's. Therefore, in a competitive market, the lender's required after-tax return must be less than the lessor's and so $r(1-t) < k$. Hence, $\alpha > 0$ and, *ceteris paribus*, leveraged leasing has a competitive edge over unleveraged leasing.

From Equation (11), it is clear that the strength of the leverage advantage depends primarily on $PVIF_{r(1-t),j} - PVIF_{k,j}$ or the relationship between the lessor's required rate of return (*k*) and the lender's *(r(1-t))*. Let Z represent the difference between these two rates:

$$Z = k - r(1 - t)$$

The greater the value of *Z*, the smaller the value of $PVIFk,j$ relative to $PVIF_{r(1-t),j}$, and from Equation (11), the larger the value of α, the leverage advantage. This phenomenon can be explained as follows. Increased divergence between the values of *k* and *r(1-t)* means increasingly cheaper borrowing cost (relative to the lessor's required yield) for the lessor, and this enhances the lessor's leverage advantage.

In addition to *Z*, the proportion of the lease investment financed by the lender (θ) is also an important determinant of the leverage advantage. Equation (9) implies that, *ceteris paribus*, α is positively related to *r*. That is, the higher the degree of leverage, the greater the leverage advantage.

Manufacturer's Advantage

The manufacturer's advantage, denoted by μ, can be measured by the difference between the *MALP* charged by the intermediary-lessor and that charged by the manufacturer-lessor when both are engaged in unleveraged leasing.[3]

A close look at Equations (1) and (5), which determine the values of L_1 and L_3 respectively, reveals the two primary sources of the manufacturer's advantage (or disadvantage): the lessors' initial investment and the provisions of the tax laws on depreciation. The manufacturer's initial investment is the opportunity cost of leasing rather than selling the asset, *(P-t(P-C))* whereas the intermediary's is the purchase price of the asset *(P)*. The

benefit of this lower initial investment, however, is partially offset by the lower depreciation base allowed the manufacturer. The asset's depreciation base for the manufacturer is the cost of producing the asset *(C)* whereas, for the intermediary, it is the full purchase price *(P)*.

From Equations (6) and (2), we have:

Equation 14

$$L_3 - L_1 = \mu = t[(p - C)(1 - \sum_{j=1}^{n} d_j PVIF_{k,j}) - (B_i - B_d)PVIF_{k,n}] / [(1 - t)PVIFA_{k,n}]$$

Since B_i and B_d, the book values of the leased asset after n years to the intermediary-lessor and the manufacturer-lessor, respectively, are given by:

Equation 15

$$B_i = P(1 - \sum_{j=1}^{n} d_j)$$

and

Equation 16

$$B_d = C(1 - \sum_{j=1}^{n} d_j)$$

Equation (14) can be rewritten as:

Equation 17

$$L_3 - L_1 = \mu = t(P - C)Q / [(1 - t)PVIFA_{k,n}]$$

where:

Equation 18

$$Q = 1 - \sum_{j=1}^{n} d_j(PVIF_{k,j}) - (1 - \sum_{j=1}^{n} d_j)PVIF_{k,n}$$

Through simulation, the value of Q is found positive for various combinations of the values of k, n and the depreciation coefficients d_j corresponding to each n value. This, and the fact that P is greater than C and $0 < t < 1$, implies that the manufacturer's advantage is positive ($\mu > 0$).

Equation (17) indicates that the lower the cost of production (C) relative to the sales price (P), the greater the manufacturer's advantage. This can be explained as follows. While a lower production cost diminishes the depreciation tax shield for the manufacturer-lessor relative to that for the intermediary, this is more than offset by a lower initial investment by the manufacturer (See the left hand side of Equation (1)). The manufacturer's advantage also varies positively with k, the after-tax yield on the lease project required by the lessors. As k increases, the intermediary-lessor's depreciation tax shield, on a present value basis, declines by a greater amount than the manufacturer's.

RELATIVE COMPETITIVENESS AMONG LESSORS

The leverage advantage and the manufacturer's advantage provide the basis for evaluating the relative competitiveness among the four different lessors. Since only the direct leveraged lessor (i.e., manufacturer-lessor in a leveraged lease) possesses both of these advantages, he is clearly the most competitive of all. The indirect

unleveraged lessor (i.e., intermediary-lessor in an unleveraged lease), on the other hand, has neither the manufacturer's advantage nor the leverage advantage and therefore is the least competitive. Thus, if the manufacturer-lessors always choose leveraged leasing and compete in every leasing opportunity, they will indeed dominate the financial intermediary-lessors. But manufacturers do typically engage in unleveraged leasing and financial intermediaries often borrow, using the assets as collateral, to finance the purchase of the leased assets. In such cases, whether the manufacturer will dominate the financial intermediary would depend on the relative strength between the manufacturer's advantage and the leverage advantage. Indeed, the difference between these two advantages is also the difference between the *MALP*s for the direct unleveraged lessor (L_1) and the indirect leveraged lessor (L_4):

Equation 19

$$L_4 - L_1 = (L_4 - L_2) - (L_1 - L_2) = \mu - \alpha = \textit{Manufacturer's Advantage - Leverage Advantage}$$

Subtracting Equation (11) from Equation (14) yields:

Equation 20

$$\mu - \alpha = (t(P - C)[1 - \sum_{j=1}^{n} d_j PVIF_{k,j} - (1 - \sum_{j=1}^{n} d_j)PVIF_{k,n}]$$
$$- \sum_{j=1}^{n} (D - tI_j)(PVIF_{r(1-t),j} - PVIF_{k,j})\} / (1/t)PVIFA_{k,n}$$

If $\mu - \alpha > 0$ in every leasing situation, then the manufacturer-lessors, including those that choose unleveraged leasing, would always dominate the financial intermediary-lessors. But if $\mu - \alpha < 0$, then the intermediary-lessors that opt for leveraged leasing would be more competitive than the manufacturer-lessors that prefer unleveraged leasing. To determine the sign of μ-α, recall that the leverage advantage (α) is positively related to both the proportion of the lease investment financed with debt (θ) and the excess of the lessor's required after-tax yield over the lender's (Z). And, the manufacturer's advantage (μ) is related negatively to the ratio of the production cost to the sales price *(C/P)* but positively to the lessor's required yield (k). Thus, the higher the values of Z, θ, and *C/P*, and the lower the value of k, the smaller the value of μ-α. Conversely, the lower the values of Z, θ, and C/P, and the higher the value of k, the larger the value of μ-α.

Tables 2-4 present the values of μ-α for selected combinations of Z, θ, *C/P*, and k values for the following leasing example:

P = asset's sales price = $10,000
n = lease period in years = 7
t = marginal tax rate = .34

In each table, the values of *C/P* and k are held constant while Z and θ are allowed to vary. Essentially, this holds the manufacturer's advantage (μ) constant and allows the leverage advantage (α) to change. The manufacturer's advantage is isolated along the first row and the first column since with $Z = 0$ in the first row or $\theta = 0$ in the first column, the leverage advantage vanishes.[4] The three tables show that neither the manufacturer-lessor choosing unleveraged leasing nor the intermediary-lessor opting for leveraged leasing dominates the other all the time (since the sign of μ-α is neither strictly positive nor strictly negative.) The manufacturer (intermediary) tends to have a comparative advantage when the difference between the lessor's required yield and the lender's (Z) is small (large) and/or when the percentage of the asset's purchase price borrowed by the intermediary (θ) is low (high). Furthermore, the domain of dominance for the manufacturer shrinks as the lessor's required rate of return (k) decreases (compare Tables 2 and 3 where k decreases from .12 to .08) or as the proportion of production cost to sales price (*C/P*) increases (compare Tables 3 and 4 where *C/P* increases from .6 to .75).

TABLE 2
Manufacturer's Advantage Over Leverage Advantage (μ-α)
When *C/P = .60* And *k = .12*

	θ								
Z	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80
0.000	143.08	143.08	143.08	143.08	143.08	143.08	143.08	143.08	143.08
0.005	143.08	137.63	132.19	126.75	121.31	115.87	110.43	104.98	99.54
0.010	143.08	132.24	121.40	110.57	99.73	88.90	78.06	67.23	56.39
0.015	143.08	126.89	110.71	94.53	78.36	62.17	45.99	29.81	13.63
0.020	143.08	121.60	100.12	78.64	57.17	35.69	14.21	(7.26)	(28.74)
0.025	143.08	116.35	89.63	62.91	36.19	9.47	(17.25)	(43.98)	(70.70)
0.030	143.08	111.16	79.25	47.33	15.42	(16.49)	(48.41)	(80.32)	(112.24)

TABLE 3
Manufacturer's Advantage Over Leverage Advantage (μ-α)
When *C/P = .60* And *k = .08*

	θ								
Z	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80
0.000	91.81	91.81	91.81	91.81	91.81	91.81	91.81	91.81	91.81
0.005	91.81	86.71	81.61	76.51	71.41	66.31	61.21	56.11	51.01
0.010	91.81	81.66	71.52	61.37	51.23	41.09	30.94	20.80	10.66
0.015	91.81	76.67	61.54	46.41	31.27	16.14	1.01	(14.13)	(29.26)
0.020	91.81	71.74	51.67	31.60	11.53	(8.54)	(28.60)	(48.67)	(68.74)
0.025	91.81	66.86	41.92	16.97	(7.97)	(32.92)	(57.86)	(82.80)	(107.75)
0.030	91.81	62.04	32.28	2.52	(27.24)	(57.00)	(86.76)	(116.53)	(146.29)

TABLE 4
Manufacturer's Advantage Over Leverage Advantage (μ-α)
When *C/P = .75* and *k = .08*

	θ								
Z	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80
0.000	57.38	57.38	57.38	57.38	57.38	57.38	57.38	57.38	57.38
0.005	57.38	52.28	47.18	42.08	36.98	31.88	26.78	21.68	16.59
0.010	57.38	47.24	37.09	26.95	16.81	6.66	(3.48)	(13.63)	(23.77)
0.015	57.38	42.25	27.11	11.98	(3.15)	(18.29)	(33.42)	(48.55)	(63.69)
0.020	57.38	37.31	17.24	(2.82)	(22.89)	(42.96)	(63.03)	(83.10)	(103.17)
0.025	57.38	32.44	7.49	(17.45)	(42.40)	(67.34)	(92.29)	(117.23)	(142.17)
0.030	57.38	27.62	(2.14)	(31.91)	(61.67)	(91.43)	(121.19)	(150.95)	(180.71)

SUMMARY AND CONCLUSIONS

Under the current tax environment, we have examined conditions under which financial intermediaries can remain competitive with manufacturers in the lessor market despite the absence of the investment tax credit. Given that manufacturers typically engage in unleveraged leasing and financial intermediaries often utilize a leveraged lease arrangement, the answer to who has the competitive advantage depends on the combined values of four different factors: the lessors' required after-tax yield, the extent to which the lessors' required after-tax yield exceeds that of the lender in a leveraged lease, the proportion of the lease investment financed with debt, and the ratio of production cost to sales price of the leased asset. The relative competitive position of the intermediary-lessor is inversely related to the first of these factors and positively related to the last three factors.

It should be noted that the effects of transaction expenses, which could be significant, and interest rate uncertainty are absent from this analysis. As Brick, et.al. [2] point out, managing interest rate uncertainty is not a costless undertaking. Others, such as Van Horne [8], point out the costs involved in hedging interest rate uncertainty in the futures markets, as well as the difficulties in constructing suitable hedges. Future research directed at allowing the inclusion of transaction costs and interest rate uncertainty in fixed rate leases would extend the model significantly.

ENDNOTES

1. See Revenue Procedures 75-21 and 75-28, Internal Revenue Ser vice Code.

2. The leverage advantage can also be measured by the difference between *MALP* charged by an intermediary-lessor in an unleveraged lease (L_3) and that in a leveraged lease (L_4). Subtracting Equation (8) from Equation (6) yields:

$$L_3 - L_4 = [\theta P - \sum_{j=1}^{n} (D - tI_j) PVIF_{k,j}] / [(1-t) PVIFA_{k,n}]$$

   The right-hand side of this equation is identical to that of Equation (9). Thus:

$$L_3 - L_4 = L_1 - L_2 = \alpha$$

3. The manufacturer's advantage can also be measured by the difference between the *MALP* charged by the intermediary-lessor and that charged by the manufacturer-lessor when both are engaged in leveraged leasing. Subtracting Equation (8) from Equation (4), we have:

$$L_4 - L_2 = t(P - C)Q / [(1 - t)PVIF_{k,n}]$$

   where Q is as given in Equation (18). It is readily seen that:

$$L_4 - L_2 = L_3 - L_1 = \mu$$

4. Since $Z = k - r(1 - t)$, if $Z = 0$, then $k = r(1 - t)$ and, by Equation (13), $\alpha = 0$. If $\theta = 0$, then the lease is unleveraged and therefore both D and I_j must be zero. And, from Equation (11), $\alpha = 0$.

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