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# LEASING VERSUS BUYING

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The authors discuss factors that must be considered in a lease versus buying decision.

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With tight money and high interest rates on borrowed funds, many retailers and wholesalers are looking more and more to equipment leasing plans as an alternative to directly purchasing equipment.

There are two basic types of leasing, generally referred to as operating and financial. The major distinguishing feature between an operating and financial lease is cancelability. An operating lease can be cancelled by giving proper notice, whereas a financial lease cannot be cancelled. An example of an operating lease is the telephone service a company leases. This is an operating lease because the lease may be terminated at the desire of either party.

This article is concerned with a retailer's or wholesaler's decision to employ financial leasing or borrowing in the acquisition of permanent equipment. As an example, the alternative of leasing or purchasing (borrowing) an industrial fork-lift truck used in warehousing will be used in this article. Temporary equipment needs, such as a lift truck to handle an extra large shipment of goods received or to be shipped, are often satisfied by operating leases.

Because of the noncancelable nature of a financial lease contract, it should be regarded as a form of financing.

Financial leasing is often used instead of other methods of financing an asset. The most common alternative to a lease would be to borrow the money from a financial institution and repay the borrowed money over the same period of time as you would if you had leased the asset. Therefore, under a financial lease the lessee's payments are, in effect, equivalent to the principal and interest payment on debt.

## Advantages of Leasing over Borrowing

The availability of 100 percent financing is probably the most widely purported advantage of leasing over borrowing. Leases permit a firm to acquire the use of an asset without having to make a down payment, or an initial equity investment. However, full financing via borrowing is generally available to a firm through one or a combination of: (1) the firm's pledging of fully owned assets; (2) a firm's past credit reputation; or (3) the firm's future earning power.

A second advantage exists in that there are generally fewer restrictive clauses with leases than with debt financing. Moreover, a firm's present loan agreements may restrict future borrowing; therefore, leasing may be the only alternative available to acquire the use of an asset.

A third advantage can be obtained because of the way leases are treated in bankruptcy and reorganization. The lessor can claim a maximum of one year's lease payments in bankruptcy and three year's in reorganization, while the debt-holder's full claim stands.

Another possible advantage of leasing over purchasing is the more favorable tax treatment consideration. A lease payment is deductible as an expense for income tax purposes. An asset purchased must be capitalized and depreciated over its useful life. The IRS sets up guidelines for useful life. Thus, the lessee can obtain a faster tax write-off, if the life of the lease payments is less than the tax guideline life and if the lessee has use of the leased asset at a zero or nominal cost after the original lease period. Therefore, the lessee would be able to delay tax payments relative to the depreciation of a purchased asset over the guideline life. However, accelerated depreciation methods have decreased the likelihood of this advantage.

Finally, another important advantage of financial leases is that often times the firm acquires the use of an asset without the lease obligation appearing as a liability on the balance sheet.<sup>1/</sup> The omission of the lease obligation, or the debt that might have been incurred had the asset been directly purchased, can have a favorable effect upon the financial ratios of a firm. For example, with a lease instead of a purchase the debt to equity ratio will indicate less financial leverage; the times interest earned will show a greater average; and the current ratio will be biased towards a larger working capital position. A close analysis of the financial statements and footnotes will often disclose this bias in the ratios. However, since many analysts do not carefully examine the statements, a firm often can obtain greater financial leverage than would otherwise be achieved.

#### Disadvantages of Leases

Because the asset being leased is owned by the lessor, any residual value at the end of the lease belongs to the lessor. Sometimes this disadvantage is offset by a clause in the lease that gives the lessee an option to purchase the equipment or renew the lease for a nominal cost at the end of the lease contract.

Another purported disadvantage of leasing is that the interest rate on leases is higher than equivalent borrowing. However, this may or may not be the case. It depends largely on the ability of the lessor to purchase the equipment at a price and borrow (or raise equity capital) at a rate, which are both lower than the lessee's ability to do the same. The lessor may then pass his economies of scale (purchasing power and credit standing) on to the lessee. This disadvantage will be examined in our quantitative analysis.

Based solely on the pros and cons just presented, one manager might choose the lease alternative while another might find the borrowing alternative preferable. A quantitative analysis can add to the qualitative factors just covered by enabling the manager to come to a final decision. This is not meant to imply that the decisions will only be based on the quantitative analysis; the qualitative advantages and disadvantages must, also, be included in the final decision.

#### Quantitative Analysis of Leasing Versus Borrowing

In order to determine whether an asset should be acquired by leasing or borrowing, the cost of each financing method should be calculated. The cost, in our case the interest rate on borrowing and the implicit financial charges in the lease payments, will depend upon the cash outflow patterns for each financing method. Since most firms have many investment opportunities with varying cash flow patterns, it is standard procedure to adjust all investment opportunities dollar flows from the different projects to one "equivalent" time period's dollars for comparison and project selection purposes. For example, a firm might require a 12 percent return or savings on its investments. In a simple case, a manager might have a choice between \$1.00 today or \$1.10 a year from now. Since a 12 percent return is required, the manager would prefer the \$1.00 today over \$1.10 one year from now. This is true because the \$1.10 in one year only yields 10 percent, which, of course, is less than the required 12 percent. The most common

procedure for adjustment is to discount all future cash flows to "equivalent" present value dollars at time period zero. One could adjust all cash flows to some future "equivalent" dollars; however, this is quite cumbersome because most projects have different cash flow life expectancies, different ending dates. Thus, in our example, discounting the \$1.10 received at time period one to an "equivalent" present value at time period zero equals \$0.98 ( $\$1.10 \times .893$ ).<sup>2/</sup> Since this is less than \$1.00, the investment should not be made. This above approach, present value dollars, can also be used to determine which alternative is least expensive. The present value dollar approach will now be used to illustrate the analysis of a lease versus buy decision on a large industrial fork-lift truck. Three examples are provided. The first is introductory. It assumes no taxes and annual rental payments. The first example assumes these simplifications so that the analysis procedure can be understood more easily. Though the assumption of no taxes might be desired, one quickly realizes it is unrealistic. The second example includes the affects of taxes on the evaluating procedure. The final example provides an actual operating decision situation where both lease payments and loan payments are made on a monthly payment basis. The inclusion of tax affects is again included in this final example.

### Illustrative Examples

A company can purchase an industrial fork-lift truck for \$10,000 cash from the CTY Corporation.<sup>3/</sup> The company can also lease the same lift truck from CTY's Credit Corporation for five years at an annual rental charge of \$2,400.<sup>4/</sup> Other relevant facts are:

1. The lessee can purchase the lift truck from the lessor for \$500 at the end of the lease contract.

2. The lessee must put up the equivalent of two months rent as a security deposit. This security deposit will be returned at the end of the lease contract.

3. The firm can obtain a loan from a local financial institution for any fixed asset requirements. The interest charge would be 12 percent. There are no other financial charges for the loan, and it may be paid back over the same period as the lease. Therefore, our yearly payments in order to repay principal and interest would be \$2,774.<sup>5/</sup>

4. Finally, the company is in the 50 percent marginal tax bracket. The IRS guidelines call for this company to depreciate the lift truck over a ten (10) year period. The company uses an accelerated depreciation method (double declining balance).

An illustration assuming no income taxes. Since the firm can borrow money at 12 percent, one can assume that this is the cost of funds to a firm. Therefore, all future disbursements and savings should be discounted to time period zero at 12 percent. This is done to restate the disbursements or savings in time period zero costs in order to obtain comparable cost figures on the lease and borrow alternative.

Table I presents the quantitative information necessary to ascertain which alternative, lease or borrow, is least expensive.

The actual period costs that are paid are shown in column 2 of Table I. The periods in which each cost will be paid are indicated in column 1. Column 3 gives the interest factor that discounts the costs of column 2 over the years in column 1 to a period zero comparable cost, presented in column 4.

From Table I it is apparent that in time period zero the lease alternative's cost, \$9109, is less than the borrowing alternative's cost, \$10,000, when one has to pay 12 percent interest on borrowed funds.

Table I  
Cost of Lift Truck  
at Time Period Zero  
(No Taxes)

Financing Method	(1) Time Period	(2) Yearly Loan or Lease Payments	(3) Interest Factor (r = 12%)	(4) Cost at Time Period Zero (2) x (3)
Borrowing:	1 through 5	\$2,774*	3.605 <sup>5/</sup>	\$10,000
Leasing:	0	\$ 400**	1.000	\$ 400
	1-5	2,400***	3.605 <sup>5/</sup>	8,652
	5	500-400****	.567 <sup>6/</sup>	57
Net Cost of Leasing				\$ 9,109
* Annual loan payment				
** Two months deposit when the lease is signed				
*** Annual lease payment				
**** Option price, \$500, less return of deposit				

Table II  
Cost of Lift Truck  
at Time Period Zero  
(No Taxes)

	(1) Time Period	(2) Yearly Lease Payments	(3) Interest Factor (8%)	(4) Cost at Time Period Zero
Leasing	0	\$ 400	1.000	\$ 400
	1-5	2,400	3.993 <sup>5/</sup>	9,583
	5	500-400	.681 <sup>6/</sup>	68
Net Cost of Leasing				\$10,051

If one could borrow at 8 percent the cost to borrow at time period zero would be \$10,000. The cost to lease at time period zero would change to \$10,051, see Table II for cost of leasing. Therefore, if one can borrow at 8 percent or less, direct purchasing would be favored over leasing in our illustration.

An illustration assuming income taxes. Analysis of leasing or borrowing costs assuming income taxes is the same as shown in Table I except the cash flows must be modified for the effects

of income tax on period cash costs. Taxes are assumed to be paid at the end of each year. Table III shows the cost of borrowing versus leasing at time period zero. Note that the analysis is now over a ten year period, rather than five years, since the IRS requires depreciation charges to be extended over this longer period.

In our example with the tax-shields, leasing is preferred to borrowing. The after-tax cost to borrow is \$5,303 whereas the cost to lease is \$4,671. However,

Table III

## Cost of Lift Truck at Time Period Zero

Financial Method	(1) Time Period	(2) Yearly Lease or Loan Payment	(3) Tax Deduction		(4) Dep.** or Lease Payment	(5) Tax Shield [(3)+(4)] x .50	(6) Interest Factor (r = 12%)	(7) Cost at Time Period Zero (5) x (6)
			Int.*	Tax Shield				
Borrowing:								
Cost -	1-5	\$2,774	-	-	-	-	3.605	\$10,000
Savings -	1		\$1,200	\$2,000	\$1,600	\$1,600	.893	( 1,429)
	2		1,011	1,600	1,306	1,306	.797	( 1,041)
	3		800	1,280	1,040	1,040	.712	( 740)
	4		563	1,024	794	794	.636	( 505)
	5		276	819	548	548	.567	( 311)
	6			656	328	328	.507	( 166)
	7			656	328	328	.452	( 148)
	8			655	328	328	.404	( 133)
	9			655	328	328	.361	( 118)
	10			655	328	328	.322	( 106)
Net Tax-Shield on Borrowing			(\$ 4,697)					
Net Cost of Purchasing			\$ 5,303					
Leasing:								
Cost***								\$ 9,109***
Savings -	1-5			\$2,400	\$1,200	\$1,200	3.605	( 4,326)
	6			200	100	100	.507	( 51)
	7			120	60	60	.452	( 27)
	8			72	36	36	.404	( 15)
	9			54	27	27	.361	( 10)
	10			54	27	27	.322	( 9)
Net Tax-Shield on Leasing			(\$ 4,438)					
Net Cost to Lease			\$ 4,671					

\* See Table IV for interest calculation

\*\* See Table V for depreciation calculation

\*\*\* See Table I.

Table IV  
Interest Calculation - Borrowing

(1)	(2)	(3)	(4)
	(4) x 12%	\$2,774- (2)	
Time Period	Interest Payment	Principal Payment	Loan (beginning of period)
1	\$1,200	\$1,574	\$10,000
2	1,011	1,763	8,426
3	800	1,974	6,663
4	563	2,211	4,689
5	296	2,478	2,478
	\$3,870	\$10,000	

Table V  
Depreciation Calculation - Borrowing

(1)	(2)	(3)	(4)
	Net Asset Balance	Depreciation	Accumulated Depreciation
Time Period	(beginning of period)	(2) x .20	
1	\$10,000	\$2,000	\$ 2,000
2	8,000	1,600	3,600
3	6,400	1,280	4,880
4	5,120	1,024	5,904
5	4,096	819	6,723
6	3,277	656	7,379
7	2,621	656*	8,034
8	1,965	655	8,690
9	1,310	655	9,345
10	655	655	10,000

Depreciation Calculation - Lease  
Purchase at end of Lease Period

6	500	200	200
7	300	120	320
8	180	72	392
9	108	54*	446
10	54	54	500

\* When the depreciation charges from straight-line (SL) on the remaining book value exceed the charges from double-declining balance, (DDB) the IRS allows one to switch from DDB to SL. This allows a greater deduction.

if we had borrowed at 8% or less, borrowing would be the selected alternative.

schedule corresponds to the general payment period in actual long term lift truck lease-purchase agreements.

An illustration assuming taxes and monthly rental payments. This section demonstrates a monthly rental payment agreement. This is an expansion from the previous illustration and is included since the monthly payment

The monthly payment solution, that leasing is cheaper than borrowing at 12 percent, agrees with our previous illustration that used annualized disbursements.

Analysis of Leasing or Borrowing  
Costs - Assuming Monthly Payments

The following assumptions are used:

Leasing -

Monthly lease payments (5 years)	\$200
Security Deposit	400
Purchase option (end of lease)	500
Rental payments made at first of month	

Borrowing -

Interest rate	1% monthly
Monthly principal and interest payment	\$222.50 <sup>8/</sup>

Both -

Marginal tax rate	50%
Depreciation guideline life	10 years
Taxes are paid at the end of 12 periods	

Conclusion

The quantitative evaluation of the lease versus borrowing decision will aid the manager in making a decision. Objective and verifiable evidence from the quantitative approach is used with the qualitative evaluation in arriving at a final decision.

The recent increase in the use of financial leases by businesses focus on the need for the manager to formulate his own approach to evaluating financial leases. A possible approach was provided to give the manager an improved decision making capability in the base versus borrowing situation.

Table VI  
Cost of Lift Truck at Time  
Period Zero

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Time Period	Monthly Lease or Loan Payment	Tax Deduction Int.	Depreciation or Lease Payment	Tax-Shield (3)x(4) x .50	Interest Factor (r = 12%)	Cost at Time Period Zero (5) x (6)
1-60	\$222.50		<u>Borrowing</u>		44.955	\$10,000
12		\$1,115	\$2,000	\$1,558	.893	(\$ 1,391)
24		917	1,600	1,259	.797	( 1,003)
36		696	1,280	988	.712	( 710)
48		445	1,024	735	.636	( 467)
60		160	819	489	.567	( 277)
72			656	328	.507	( 166)
84			656	328	.452	( 148)
96			656	328	.404	( 133)
108			655	328	.361	( 118)
120			655	327	.322	( 106)
Net tax-shield on borrowing						\$ 4,519
Net cost of purchasing						<u>\$ 5,481</u>
0	\$600*				1.00	\$ 600
1-59	200				44.405	8,881
60	500-400				.567	56
Net cost						\$ 9,537
Savings**						( 4,438)
Net cost of leasing						<u>\$ 5,099</u>

\* Deposit of \$200 and rental payment for first month (\$200) in advance. All rental payments are in advance (therefore last payment is at the end of the 59th month).

\*\* See Table III (net tax-shield on leasing).

## FOOTNOTES

1/ Accounting Principles Board, "Disclosure of Lease Commitments by Leasees," Opinion No. 31 (New York, American Institute of Certified Public Accountants, June, 1973). This Opinion requires disclosure of financial lease commitments not capitalized and should allow the reader to determine the effects of leasing on future fixed obligation.

2/ The present value factor at 12 percent of .893 may be obtained from any present value interest tables. Suggested reference is Financial Compound Interest and Annuity Tables, Financial Publishing Company.

3/ Implicit in the assumption is that the lift truck is justified as a capital expenditure.

4/ A more realistic illustration of monthly lease payments made in advance on leased equipment is given in the last section.

5/ \$10,000/3.605. The 3.605 was obtained from the Present Value of \$1 Received Annually for N Years Table, where N=5 and r=12%. See footnote 2 for reference. The 3.993 is where N=5 and r=8%.

6/ Obtained from Present Value of \$1 N Years Hence Table. See Footnote 2 for reference.

7/  $\$10,000 = \frac{60}{t} \cdot \frac{P}{(1.12)^t}$ , where t = is a specific month, t of the 60 month life of the loan and p is the monthly payment. This could be obtained from present value tables 12 percent annual or 1 percent monthly. See footnote 2 for reference.

8/ \$10,000/44.955. The 44.955 was obtained from the Present Value of \$1 Received Annually for N Years Table; where N = 60 and r = 1% monthly or 12% annually.