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Leasing vs. Buying Farm Machinery

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Equipment leasing has gained favor with farmers and ranchers in recent years. Leasing often can be advantageous, but one must understand how leases work and how to compare the costs of leasing and buying.

When equipment is purchased, the buyer owns 100 percent of the property and has complete control of it. He can keep it as long as he likes and dispose of it at any time. When equipment is leased, the lessee contracts to keep the equipment for a fixed amount of time, usually 3 years. During that time he has control of its use, but he cannot dispose of it.

Determining Lease Cost

When equipment is purchased, the buyer pays the entire purchase price (with interest if the purchase is financed). When equipment is leased, the lessee pays for use of the equipment for a specific lease period. At the end of the lease the equipment will still have value to its owner (the dealer), who can sell it or lease it again. The estimated worth of the equipment at the end of the lease period is called the residual value, and it is usually stated as a percentage of the purchase price. The price of a lease is the purchase price minus the residual value. Just as interest may be charged to a purchaser, a lessee is charged a money or lease factor. This factor, which is often negotiable, is based on prevailing interest rates and is applied to the purchase price to calculate the amount of interest to be charged during the lease period. Thus, the total cost is determined by subtracting the residual value from the purchase price and then adding the lease factor (interest) charge.

A lease is negotiable just as a purchase price is negotiable. To lower the cost of buying equipment, one asks for a lower price and/or a lower interest rate. The same figures can be negotiated in a lease.

Most equipment leases are "closed-end" leases. This means the lessee can return the equipment at the end of the lease with no obligation. However, most closed-end leases allow the lessee to purchase the equipment for the residual value. A third option is for the lessee to use any excess value, above the residual value, on a new lease. For example, if the actual market value of equipment at the end of a lease is $60,000, and the residual value (for which the lessee has the option to purchase the equipment) is $50,000, most dealers will allow the $10,000 excess to be applied to a new lease of new equipment.

Analyzing Lease vs. Purchase

Now to the cost comparison. Almost all leases require the lessee to pay for insurance, taxes, fees and normal maintenance costs, the same costs that one must pay when equipment is purchased. In our cost analysis (Tables 1 and 2), these items are ignored because they are the same in both scenarios.

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Almost all leases require an additional payment at the end of the lease if the equipment has been used for more hours than stated in the lease. So it is important for a lessee to know the approximate number of hours the equipment will be used over the lease period, and have the dealer calculate the payments on the basis of this estimated usage. The dealer may initially offer a low lease payment based on an abnormally low number of hours. This can cost the lessee more money at the end of the lease. However, making lease payments on the basis of too high an estimate of usage is not wise either. The calculations most likely will be done in blocks of 300 hours per year. That is, 300 hours per year is the base calculation, and the next increments would be 600 and 900 hours per year. If the lessee estimates his usage will be substantially less than one of these calculation points, he should ask that the calculation be made on the basis of his estimate. For example, if the lessee estimates his usage will be 500 hours per year he may assume that the 600-hour level is a close fit with his needs. However, at the end of a 3-year lease he will have paid for 300 more hours than the equipment was actually used. The lessor may counter the lessee's request for a lower calculation by stating that the lessee will recover this cost by having the option to purchase equipment with a market value that should be greater than the residual value.

Equipment that is leased may have a different economic life and is taxed differently than equipment that is purchased. Therefore, the most widely accepted method of comparing these two options is the net after tax cash flow analysis. This method begins with an estimate of taxable income. The costs of purchasing (interest and depreciation), the costs of leasing (all lease costs), and income taxes are then deducted under both scenarios to arrive at the net taxable income.

On the purchase option, depreciation, which is not a "cash" expense, is added back to the net after tax figure. However, the amount of "cash" that is paid on the principal each year must be subtracted. This figure, the net after tax cash flow, is calculated for each year in the life of the equipment. Even though leased equipment usually has a shorter "life" than purchased equipment, the two scenarios must be analyzed for the same length of time to get an equitable comparison. Thus, if the lease would be for 3 years, it is assumed that purchased equipment would be sold after 3 years and the amount received added to the net after tax cash flow. If there is still an outstanding principal balance on the note, that amount is deducted from the "sale" price and shown as an increase in cash outflow for that time period. Capital gains taxes on any gain above the book value also must be considered.

Because the annual net after tax figure for buying or leasing will differ over the evaluation period, each annual figure must be discounted back to the initial point of the purchase or lease. Many analyses use the current rate of inflation as the discount rate.

Analysis Illustration

To illustrate the analysis method, two scenarios are depicted in Tables 1 and 2. The purchase scenario (Table 1) is based on the following information. The purchase price of the equipment is $100,000. The purchase requirements are $20,000 payable at closing with a 7-year note at 12 percent interest. Depreciation is over 7 years using an accelerated schedule. The lease criteria for the same equipment with the same purchase price (Table 2) is an initial payment of $18,665 at the signing followed by two payments of the same amount at the end of the first and second years. The residual value and the market value are estimated to be $67,165 at the end of the lease period.

The purchase option is based on an equipment life of 3 years, which is the end of the lease period. Table 1 reflects the $20,000 that must be paid upon purchase. Subsequent data is reflective of the cost information gathered at the end of each successive year of the analysis.

The process considers the cash outflow of interest and principal and deductions for depreciation. The resulting annual tax adjusted cash outflow is discounted using an appropriate discount factor, in this example a 6 percent discount rate.

This process is repeated for each of the 3 years. To maintain an equitable comparison, at the end of the third year we assume that the equipment is sold for the amount of the residual value under the lease, $67,165. From that amount, the amount left on the note ($53,628) is subtracted. The difference between the book value and the sales price—$12,035—is subject to capital gains tax. After this tax is deducted, $11,130 is added to the third year's cash flow.

Table 2, which reflects the net after tax cash flow under a lease option, is a bit simpler. Under a lease arrangement, an initial payment is made at the beginning of the lease and subsequent payments are made at the end of years 1 and 2. After calculating the taxes on this amount, the result is the annual after tax cash flow.

In this example the purchase option is the more economical because the net present value for that option is higher. However, the decision could be reversed if the value of the equipment at the end of 3 years were lower than the residual value or if a higher discount factor were used. Thus, while one can analyze lease vs. purchase options, the analysis is made before the fact and assumptions about income, costs, and market value can easily change.

Table 1. Debt-Purchase Analysis.

Year	A Principal payments	B Interest payments	C Depreciation	D Residual value	E $Tax deductible (B + C-D)	F Tax savings[1] (E x.28)	G Tax adjusted cash flow (A + B-D-F)	H Discount factor[2] (6%)	I Discounted cash flow (G x H)
0	-20,000						-20,000	1.00	-20,000
1	-7,764	-9,182	-10,710		19,892	5,570	-11,376	.943	-10,728
2	-8,749	-8,198	-19,130		27,328	7,652	- 9,294	.890	-8,272
3	-9,859	-7,088	-15,030		22,118	6,193	-10,753	.840	-9,033
	-53,628			67,165	12,035*	2,407**	11,130	.840	9,349
						Net Present Value of Cash Flow			-$38,684

*Salvage Value minus Book Value[3]

**(Residual Value - Book Value) x .20

[1]Marginal income tax rate.

[2]Discount factors are obtained from Table 3 (discount rate table).

[3]The book value is the purchase price less the accumulated depreciation.

Table 2. Lease Analysis.

Year	A Lease payments	B Tax[1] savings (A x.28)	C Tax adjusted cash flow (A - B)	D Discount factor (6%)[2]	E Discounted cash flow (G x H)
0	-18,665		-18,665	1.0	-18,665
1	-18,665	5,226	-13,439	.943	-12,673
2	-18,665	5,226	-13,439	.890	-11,960
3		5,226	5,226	.840	4,390
				Net Present Value of Cash Flow	-$38,908

[1]Marginal income tax rate.

[2]Discount factors are obtained from Table 3.

Table 3. Annual Discount Factors.

Year	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	.943	.935	.926	.917	.909	.901	.893	.885	.877	.870
2	.890	.873	.857	.842	.826	.812	.797	.783	.769	.756
3	.840	.816	.794	.772	.751	.731	.712	.693	.675	.658
4	.792	.763	.735	.708	.683	.659	.636	.613	.592	.572
5	.747	.713	.681	.650	.621	.593	.567	.543	.519	.497
6	.705	.666	.630	.596	.564	.535	.507	.480	.456	.432
7	.665	.623	.583	.547	.513	.482	.452	.425	.400	.376
8	.627	.582	.540	.502	.467	.434	.404	.376	.351	.327
9	.592	.544	.500	.460	.424	.391	.361	.333	.308	.284
10	.558	.508	.463	.422	.386	.352	.322	.295	.270	.247
11	.527	.475	.429	.388	.351	.317	.288	.261	.237	.215
12	.497	.444	.397	.356	.319	.286	.257	.213	.208	.187

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