INSTALLMENT LAND SALES: NET PRESENT VALUE ANALYSIS OF THE PRICE-INTEREST RATE TRADE-OFF

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ABSTRACT

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High interest rates and a slow market have caused owner financing to become a popular method of financing farmland sales. Analysis shows that under certain conditions owners can finance sales at interest rates several points below recent market rates without sacrificing after-tax present value relative to cash sales.

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Introduction

High interest rates have helped create a very slow market for real estate sales. One technique which has frequently been used by land owners to facilitate the sale of real property is owner financing. The key component of most owner financed sales which attracts the prospective buyer is a reduced rate of interest.

With recent open market interest rates in the neighborhood of 15 percent and variable, a loan with a fixed rate of 10-12 percent or less can look very attractive to the buyer. In fact, in many cases a reduced interest loan may be the only way the buyer can afford to make the purchase.

For the seller, owner financing may appear less desirable. He has to weigh the certainty of a cash sale against the many variables of an installment sale. If he opts for financing the sale he must negotiate not only the sale price but also the down payment, the interest rate and the finance period. In addition, he must worry about the possibility of late payments and perhaps even a foreclosure which would lead to a return of the property. On the other hand, he is probably aware that there may be some income tax advantages from receiving payment over a period of several years rather than all at once.

This paper compares an owner financed installment sale with a cash sale from the seller's viewpoint. A computer model was developed which calculates the after-tax net present value of these two types of sales.

Advantages of an Installment Sale

There are primarily two reasons a seller would choose to finance a sale rather than demand immediate payment. First, if he finances at a below-market interest rate, the seller may be able to command a higher price than he would otherwise obtain. The advantage of giving-up interest to get a higher sale price may not be obvious to everyone. Interest income is 100 percent taxable. A higher sale price on land results in a larger capital gain. Only 40 percent of long-term capital gains are taxed [1]. By asking a high sale price and offering a reduced interest loan, the seller is effectively exchanging 100 percent taxable interest for 40 percent taxable capital gain.

IRS Code, §483 [2], requires that a 10 percent minimum rate of interest be imputed on installment land contracts that do not call for at least 9 percent interest. A partial exception is made in certain cases involving land sales to relatives [3]. This provision acts as a restraint to sellers who offer very low interest loans as an enticement to purchase at a high price.

The second advantage to the seller of owner financing is that it spreads payment over a number of years, and thereby, potentially reduces the income taxes which will be due on the sale. This second reason arises from the highly progressive nature of the U.S. income tax system. The seller may find the government demanding a large portion of a cash sale, yet willing to accept a much smaller percentage of an installment sale.

In order for the owner to be able to finance the sale, the property must be relatively free from debt. Owners who need cash to pay off an existing mortgage cannot afford the luxury of an installment sale.

Assumptions

This paper analyzes the sale of farmland. It is assumed that selling costs are the same regardless of whether the land is sold on a cash or an owner financed basis. The land is sold to a non-relative, and imputed interest is calculated for interest rates below 9 percent [4].

There are a great many potential variables which can enter into the calculation of income taxes. In order to simplify this analysis and to keep these variables to a manageable number, a variety of assumptions have been made about the seller. The seller has no carryover of net operating losses, investment credit, or other tax credits. He does not wish to use income averaging. He is a married individual, files a joint tax return, has no dependents, and takes the standard deduction.

The property qualifies for longterm capital gains treatment. The seller has no tax preferences with respect to the alternative minimum tax as amended by the Tax Equity and Fiscal Responsibility Act of 1982 [5], other than the 60 percent capital gain deduction. Due to variation among the states, no state income tax is considered in this analysis.

Under the provisions of the Economic Recovery Tax Act of 1981 [6], the federal income tax rates are being reduced in 1981, 1982, and 1983. In addition, after 1984 the tax rates will be adjusted for inflation [7] as measured by the Consumer Price Index. To simplify, this analysis uses the 1984 tax schedule [8] for all income tax calculations.

The additional taxes caused by the sale are a function of the seller's other taxable income (net of deductions) and the capital gain on the sale.

Cash Sale

The present value of a cash sale of farmland can be represented by Equation 1.

$$(1) \quad PV_{cs} = \$A * ACRES - TAX$$

where PV_{cs} = Present value of cash sale

$\$A$ = Selling price per acre

ACRES = Number of acres sold

TAX = Additional taxes because of sale

The capital gain can be represented by Equation 2.

$$(2) \quad CAPGA = (\$A - BA) * ACRES$$

where CAPGA = Capital Gain

BA = Basis per acre

Other variables are as defined earlier

Capital gains are included in the calculation of both the regular taxable income and the income subject to the alternative minimum tax. Forty percent of the capital gain is included with other taxable income to determine the regular income tax. For the alternative minimum tax, 100 percent of the capital gain is included along with other taxable income. The alternative minimum tax [9] is calculated by taking 20 percent of alternative minimum taxable income in excess of $40,000 for a married couple filing jointly. Alternative minimum taxable income is computed by adding preference amounts to adjusted gross income and then subtracting allowable deductions. The alternative minimum tax is paid to the extent it exceeds the regular income tax.

Installment Sale

Calculating the present value of the installment sale is more difficult since payments are spread over several years and include both principle and

interest. The present value of an installment sale is represented by Equation 3.

$$(3)\quad PV_{IS} = DP\% * \$A\ \ ACRES - TAXDP + \sum_{i=1}^{N} (PRIN_i + INT_i - TAX_i) * (1 + DIS)^{-i}$$

where

PV_{IS} = Present value of installment sale
DP% = Percent down payment
TAXDP = Additional tax due on down payment
N = Number of years financed
i = Year
$PRIN_i$ = Principal payment in year i
INT_i = Interest payment in year i
TAX_i = Additional tax in year i because of sale
DIS = Discount rate
Other variables are as defined earlier

The taxes due are a function of the seller's other taxable income, the capital gain on the sale, and interest earned. Both regular income taxes and the alternative minimum income tax are calculated.

It is assumed that the installment sale will be repaid with an amortized loan [10]. Amortization results in equalization of annual payments with the amount of principal payment and interest payment varying inversely.

Results

There are five key variables which largely determine the desirability of an installment sale from the seller's viewpoint: selling price per acre, basis per acre, number of acres sold, other taxable income, and discount rate. It is obviously not feasible to report all possible combinations of these variables. Only a few levels are presented here to illustrate the trade-off between price and interest.

A selling price of $1000 per acre is used for the installment sale. Two values are used for basis, $300 and $600 per acre. Five sizes of land sales are simulated--40, 80, 160, 320 and 500 acres. An 8% discount rate is used. The discount rate should equal the best after-tax rate of return which the seller can receive if he has a cash sale and then reinvests the income.

One of the key items which determines the amount of taxes due on the sale is the seller's other taxable income. The greater the other taxable income, the higher the marginal tax rate will be for the land sale. Quite often the seller will have a high taxable income in the year of a sale, since a land sale is often accompanied by sale of other assets such as livestock, machinery, and stored crops. If the seller retires after selling the land, he is in a particularly advantageous position to use an installment sale. Social Security benefits are tax-free. Therefore, a retired farmer may well have no taxable income except from the sale of the land. For this analysis, other taxable income in the year of sale is fixed at $20,000. Two levels of other taxable income for post-sale years are analyzed--$0 and $20,000.

The desirability of owner financing is highly dependent upon the levels of the five key variables discussed earlier. In order to make the results more understandable, a base situation is used. Assume Mr. Smith is planning to sell his 160 acre farm. He prefers a cash sale, but he is willing to

finance the sale at $100 per acre with 10% down payment. Smith's basis in the land is $300 per acre and he has other taxable income of $20,000 per year. An 8% discount rate is used. Smith wonders how his after-tax position with an installment sale would compare to a cash sale.

Table 1 shows the per acre cash selling price which Smith must receive in order to provide an after tax value equal to the net present value of the installment sale. If Smith is willing to finance the 160 acres for five years at 9% interest, then the installment sale will give him an after tax net present value equal to the after tax value of $1019 per acre cash sale. If he finances for 15 years at 9%, he has a present value equal to a $1006 cash sale.

Table 1. Cash Sale Price (Per Acre) Need to Equal After Tax Net Present Value of Installment Sale--160 acres; $1000 per Acre; $300 per Acre basis; 10% Down Payment; 8% Discount Rate; $20,000 Other Taxable Income per Year

Interest Rate (%)	Finance Period (Yrs.)			
	5	10	15	20
6	$ 944	$ 894	$ 844	$ 809
7	972	928	896	870
8	991	967	948	932
9	1019	1013	1006	999
10	1039	1051	1056	1059
11	1059	1089	1108	1124
12	1081	1126	1159	1187
13	1102	1162	1212	1251
14	1124	1201	1264	1314

Table 2 shows the results of an installment sale of the same 160 acres for $1000 per acre. The only change is that the seller retires after the sale and has no other taxable income in subsequent years. As you can see, the equivalent cash prices are all higher than in Table 1. This seller can offer 9% interest and 5-year financing and have a net present value equal to a cash sale price of $1163 per acre. If he finances for 20 years at 9%, he will have the present value equivalent of a $1303 per acre cash sale. Given

the level of current open market interest rates, the probability of being able to find a buyer willing to buy the 160 acres, owner financed at 9%, is much higher than the odds of finding a cash buyer.

Table 2. Cash Sale Price Per Acre Needed to Equal Net Present Value of Installment Sale--160 acres; $1000 per acre; $300 per acre basis; 10% down payment; 8% discount rate; $20,000 other taxable income in year of sale; $0 other income after sale

Interest Rate (%)	Finance Period (Yrs.)			
	5	10	15	20
6	$1081	$1091	$1090	$1084
7	1107	1136	1149	1154
8	1134	1180	1208	1227
9	1163	1228	1272	1303
10	1188	1273	1333	1377
11	1213	1317	1393	1452
12	1238	1362	1456	1520
13	1262	1408	1511	1660
14	1287	1453	1585	1690

Table 3 shows the results for a situation identical to the base situation analyzed in Table 1, except the seller's basis in the land is increased from $300 to $600 per acre.

Table 3. Cash Sale Price Per Acre Needed to Equal Net Present Value of Installment Sale--160 acres; $1000 per acre; $600 per acre basis; 10% down payment; 8% discount rate; $20,000 other taxable income per year

Interest Rate (%)	Finance Period (Yrs.)			
	5	10	15	20
6	$ 915	$ 859	$ 815	$ 782
7	937	895	862	835
8	960	932	909	892
9	986	974	962	951
10	1006	1007	1008	1007
11	1025	1043	1057	1067
12	1045	1078	1106	1128
13	1065	1115	1158	1192
14	1085	1153	1211	1256

The higher basis results in less capital gain which causes the installment sale to be less desirable. For a 5-year loan, an interest rate in excess of 10% is needed in order to obtain a present value equal to a $1000 per acre cash sale.

Table 4 presents a third variation. Everything is as it was for the base situation, except a higher discount rate (10%) is used. As would be expected, the use of a 10% discount rate decreases the desirability of an installment sale.

Table 4. Cash Sale Price Per Acre Needed to Equal Net Present Value of Installment Sale--160 acres; $1000 per acre; $300 per acre basis; 10% down payment; 10% discount rate; $20,000 other taxable income per year

Interest Rate (%)	Finance Period (Yrs.)			
	5	10	15	20
6	$ 894	$ 811	$ 750	$ 704
7	916	847	793	753
8	939	884	838	803
9	966	926	890	860
10	986	960	934	913
11	1005	993	980	967
12	1025	1027	1026	1023
13	1044	1061	1072	1078
14	1063	1096	1117	1133

The first four tables have been presented as representative examples. Table 5 presents the breakeven interest rates (the interest rate which produces an after tax net present value equal to a cash sale for $1,000 per acre) for a variety of different situations. Each situation shown in Table 5 is based upon an owner financed sale for $1000 per acre with 10% down payment. Each case uses an 8% discount rate and assumes other (non-sale) taxable income in the year of the sale is $20,000.

As Table 5 shows, in general the breakeven interest rate is the lowest (therefore, owner financing is more desirable) when the number of acres is

small, the basis is low, or the other taxable income during the finance period is low. In addition, short finance periods have a slight advantage over long periods.

Table 5. Interest Rates Which Give an After Tax Present Value Equal to a $1000/acre Cash Sale. Assuming: $1000/acre sale price; 10% down payment; 8% discount rate; $20,000 other taxable income in the year of sale

No.of Acres	Per Acre Basis	Other Taxable Income/ Year After Sale	Breakeven Interest Rate (%) Finance Period (Yrs.) 5	10	15	20
40	$ 300	$ 0	5.3	5.7	6.0	6.2
40	300	20,000	9.1	9.1	9.1	9.2
40	600	0	5.5	5.5	5.6	5.6
40	600	20,000	9.5	9.5	9.5	9.6
80	300	0	5.4	5.7	6.1	6.3
80	300	20,000	8.9	9.1	9.1	9.2
80	600	0	5.6	5.7	5.7	5.8
80	600	20,000	9.6	9.6	9.7	9.7
160	300	0	5.1	5.2	5.6	5.8
160	300	20,000	8.3	8.7	8.9	9.1
160	600	0	5.7	5.9	5.9	6.0
160	600	20,000	9.7	9.7	9.8	9.9
320	300	0	5.2	5.2	5.7	6.1
320	300	20,000	8.3	8.8	9.0	9.2
320	600	0	6.1	6.6	6.8	6.9
320	600	20,000	9.8	9.9	10.1	10.2
500	300	0	5.7	6.2	6.6	6.8
500	300	20,000	8.6	9.1	9.4	9.6
500	600	0	7.0	7.5	7.7	7.8
500	600	20,000	10.1	10.4	10.6	10.7

Summary and Conclusions

Owner financing is becoming a popular method of financing real estate sales. The critical component of most owner financed sales is an interest rate which is below the market rate.

This paper compared the after-tax net present value of owner financed sales of farmland with cash sales. Analysis shows that under certain circumstances. the seller may be able to finance the purchase at interest rates several points below recent market rate without sacrificing any present value relative to a cash sale.

Owner financing is an option that is usually viewed by the seller as a sacrifice he has to make in a slow real estate market in order to sell his property. In some cases this is true, but in many cases owner financing may place the seller in a better after-tax position than a cash sale.

Although the six tables presented certainly do not cover all possible situations, they do allow for some generalization about owner financed installment sales. In general:

The larger the acreage, OR
The higher the basis; OR
The higher the discount rate; OR
The lower the other taxable income in the year of sale; OR
The higher the other taxable income in years after the sale; OR
The longer the finance period . . .

the higher is the interest rate needed to make the net present value of an installment sale equal to that of a cash sale at the same price.

REFERENCES

1. IRS Code Secs. 1202, 1222(11).

2. IRS Code Sec. 483(b); Regs. Sec. 1.483-1(c)(d); Regs. Sec. 1.483-2(a).

3. IRS Code Sec. 483(g).

4. IRS Code Sec. 483(b); Regs. Sec. 1.483-1(c)(d).

5. Tax Equity and Fiscal Responsibility Act of 1982, signed 9/3/83; Act Sec. 201; IRS Code Secs. 55-58.

6. Public Law 97-34.

7. IRS Code Sec. 1(f).

8. IRS Code Sec. 1(a)(3).

9. IRS Code Secs. 55-58.

10. Berry, Hopkin, and Baker. Financial Management in Agriculture, Second Edition, Interstate Printers and Publishers, Inc., Danville, IL, 1979.