

Land Purchase Analysis

With this program, the user can evaluate the economic return on a farmland purchase and calculate a maximum bid price. The maximum bid price is the purchase price that allows the investor to earn a specific rate of return under stipulated conditions. The sensitivities of the maximum bid price to changes in the terms of the purchase, investment horizon, and investor conditions also can be assessed.

The information needed to run this program can come from:

- An individual's farm records
- Land sale announcement
- Financing information

To use this program, estimates of land, financial, and tax information are required. The program requests:

Land Information

Analysis price, additional cash flows in first year, property taxes in the first year, annual cash flow growth rate, annual appreciation rate of land values, closing fees, and selling fees.

Financing Information

Down payment, annual interest rate on loan, and length of loan (number of years).

Investor Information

Marginal tax rate, capital gains tax rate, and after-tax discount rate.

Solver Information

Investment yield sensitivity range and cash flow sensitivity range



The Main Menu is shown below:



Land Purchase Analysis

Used to determine the maximum bid price of a land investment opportunity and sensitivity to terms.

-Select Report to View -Select Report to Print

Land Information:		Financing Information:	
Analysis price	\$ 2,800	Down payment (%)	30%
Additional cash flows: year 1	\$135.00	Annual interest rate on loan (%)	8.000%
Optional: Enter cash flows via crop budgets	Crop Budget	Length of loan (years)	20
Property taxes: year 1	\$ 24.00	Investor Information:	
Annual cash flow growth rate (%)	3.00%	Marginal tax rate (%)	30%
Annual appreciation rate of land values (%)	3.00%	Capital gains tax rate (%)	20%
Closing fees (% initial purchase)	1.00%	After-tax discount rate (%)	6.000%
Selling fees (% end of horizon)	1.00%		
Solver Information:			
Investment yield sensitivity range (%)	2%	<input type="button" value="Solve for Maximum Bid Price"/>	
Cash flow sensitivity range (%)	10%		
Results			
Net Present Value: Analysis Price		Maximum Bid Price	
5 year investment horizon	(103.5)	5 year investment horizon	\$2,156
10 year investment horizon	(147.1)	10 year investment horizon	\$2,281
30 year investment horizon	(228.1)	30 year investment horizon	\$2,429
Investment Yield: Analysis Price		Initial Cash Flow Needed to Achieve Desired Yield	
5 year investment horizon	3.71%	5 year investment horizon	\$168.2
10 year investment horizon	4.54%	10 year investment horizon	\$160.3
30 year investment horizon	5.36%	30 year investment horizon	\$151.9
Cash Flow Growth Rate Needed to Achieve Yield		Appreciation Rate Needed to Achieve Desired Yield	
5 year investment horizon	16.88%	5 year investment horizon	4.09%
10 year investment horizon	7.85%	10 year investment horizon	3.88%
30 year investment horizon	4.15%	30 year investment horizon	3.75%

Navigating the Program

Data are entered using the Main Menu. Two buttons appear on the Main Menu: Solve for Maximum Bid Price and Crop Budget.

is used to calculate the maximum bid prices, cash flow needs, appreciation rate needed, and cash flow growth rate for 5-, 10-, and 30-year investment periods.

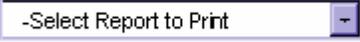
is discussed in the Land Information section of the Input description that follows this section.

The Main Menu also contains two drop-down menus .

The menu allows a user to select the name of a report on the Main Menu to view. To do this:

1. Place the cursor on the arrow of the “select report to view” box

2. Scroll down to highlight the report of choice, and
3. Click the left button on the mouse.

The  menu allows a user to select the name of a report on the Main Menu to print.

To do this:

1. Place the cursor on the arrow of the “select report to print” box,
2. Scroll down to highlight the report of choice, and
3. Click the left button on the mouse.

** The following reports are available to view and print: SENSITIVITY TABLES, CROP BUDGETS, 5-YEAR MODEL, 10-YEAR MODEL, 30-YEAR MODEL, CASH FLOW CHART, YIELD CHART, and GROWTH CHART. Each report is described later in the documentation.

Tabs located at the bottom of the Excel spreadsheet screen help the user navigate the program. To view a screen, click on the appropriate tab as discussed below. The tabs are described below.

Main-Land Bid Price Displays the input menu.

Sensitivity Tables Displays six tables that represent the effect of outcomes when inputs are changed.

Crop Budgets Displays the CROP BUDGETS input worksheet. This worksheet also can be found by using the Crop Budget button on the Main Menu.

5-year Model Displays the 5-year horizon cash flow worksheet.

10-year Model Displays the 10-year horizon cash flow worksheet.

30-year Model Displays the 30-year horizon cash flow worksheet.

Cash Flow Chart Displays a graph representing the sensitivity of the bid price to changes in cash flow.

Yield Chart Displays a graph representing the sensitivity of the bid price to changes in investment yields.

Growth Chart Displays a graph representing the sensitivity of the bid price to changes in the growth rate of cash flows and land values.

How to Use the Input Sections

The Land Purchase Analysis program allows the user to enter all required input on a single input screen. This screen is shown on the next page.

Typically, inputs are entered on a per-acre basis; however, purchase prices and costs for the entire purchase can be used. The worksheet at the end of this documentation is provided for use when collecting and reporting the information needed to compare scenarios.

The input required for this program is entered in 4 sections: land information, financing information, investor information, and solver information. Each section is described, including an explanation of the data entered in the Main Menu shown above.

Land Information

Analysis price is the asking price of the property or a price a user wishes to evaluate. In the example on the previous page, the user is evaluating a price of \$2,800 per acre.

Additional cash flows: year 1 is the net cash flows generated by the land in the first year after purchase. The value includes the user's cash inflows and outflows except for real estate taxes and loan payments. For a landowner, net cash flow may consist of the cash rent value received for land, while an owner-operator's net cash flow may consist of accumulated costs. The user may estimate the cash flows in the first year by using the "Crop Budget." To do this, click on

. An explanation of it is given below. If the analysis price is entered

on a per-acre basis, be sure to enter additional cash flows on a per-acre basis.

The **Crop Budget** button is shown in the input section after "Additional cash flows: year 1." This button displays the CROP BUDGET REPORT (shown below). This section allows the user to enter detailed crop information to determine the additional cash flows for the farmland in the first year of ownership.

Crop Budget Input Worksheet

Net Cash Flow Calculations	Per Tillable Acre			Total
	Commodity 1	Commodity 2	Commodity 3	
% Total Acres	0%	0%	0%	0%
Market Price Per Bushel	-	-	-	-
Average Yield (bu./acre)	-	-	-	-
Other per acre income/cash rent received	-	-	-	-
Total revenue per acre	\$ -	\$ -	\$ -	\$ -
Expenses per acre (exclude property taxes entered in model)				
Fertilizer	0	0	0	0.0
Chemical	0	0	0	0.0
Seed	0	0	0	0.0
Utility	0	0	0	0.0
Insurance	0	0	0	0.0
Misc.	0	0	0	0.0
Repair	0	0	0	0.0
Machine Hire	0	0	0	0.0
Fuel	0	0	0	0.0
Auto: farm	0	0	0	0.0
Building Repair	0	0	0	0.0
Storage & Drying	0	0	0	0.0
Labor	0	0	0	0.0
Sub-total	\$ -	\$ -	\$ -	\$ -
Operating & Nonreal Estate Interest	0	0	0	0.0
Depreciation	0	0	0	0.0
Total Expenses	\$ -	\$ -	\$ -	\$ -
Net Cash Flow: year 1	\$ -	\$ -	\$ -	\$ -

Return to Main

Print

Clear Values

Use Values in Model

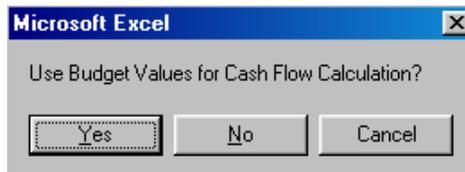
How to Use the Crop Budget Input Worksheet

For each commodity, enter inputs in cells shaded in yellow. Be sure to calculate values on a PER-TILLABLE-ACRE basis. The model will calculate the subtotals, total expenses, and net cash flow for year 1 as information is entered. For estimates of per-acre costs, go to the “Management Section” at the *farmdoc* website (www.farmdoc.uiuc.edu).

Use Values in the Model: To enter the values on the Main Menu, click on

Use Values in Model

. The screen shown below will appear.



If “Yes,” is selected, the Main Menu will automatically appear and the information from the crop budget is entered next to “Additional Cash Flows: Year 1.”

Property taxes in year 1 The amount of property taxes used in calculating property tax obligations. If the analysis price is entered on a per-acre basis, be sure to enter property taxes on a per-acre basis. The user has entered a property tax of \$24 per acre in the example.

Annual cash flow growth rate (%) The annual anticipated change in cash flows from the *additional cash flows for year 1* entry. The user estimates that cash inflows will increase 3% per year.

Annual appreciation rate of land values (%) The annual anticipated change in land values. The user anticipates that land values will increase 3% per year.

Closing fees (% of initial purchase) The amount of fees paid (expressed in % of analysis price) to close on farmland at the time of purchase. Closing fees equal the analysis price multiplied by this entry. In the example, the user estimates closing fees to cost 1% of the analysis price.

Selling fees (% end of horizon) The approximate fees (expressed as a % of final land price) required to sell this property. Selling Fees equal the value of land at the end of the horizon multiplied by this entry. In the example, the user estimates selling fees to cost 1% of the end of horizon price.

Note: Closing and selling fees are included in the analysis to project the most appropriate financial return of the investment for the user's time horizon. While selling the property may not be in the near future, the property eventually will be sold or passed down to another generation. It is important to include an estimate of the selling costs, in order to analyze the return for the true holding period of the property.

For example, an acre of land with an analysis price of \$2,800 and no closing or selling fees has an estimated 30-year return of 5.45%. This same transaction has an estimated 30-year return of 5.36% if the closing fees (1%) and selling fees (1%) are included. The differences become larger the shorter the time horizon.

Financing Information

Down payment (%) The amount of purchase price that is not financed. The percentage entry can range from 0 to 100%. An entry of "0" means that the entire purchase price is financed with debt. An entry of "50" means that half of the maximum bid price is financed with debt. Equal payments are calculated using straight-line amortization. In the example, the user will pay 30% of the purchase price with a cash down payment and finance 70% of the purchase price with debt.

Annual interest rate on loan (%) The rate at which interest is charged on the remaining balance of the loan each period. A loan with an 8% interest rate is used for this example.

Length of loan (years) The amortization period for the loan. The user will have 3 years to repay the money borrowed in the example.

Investor Information

Marginal tax rate (%) The user's marginal income tax rate. An entry of 15% means that \$0.15 of the next taxable dollar of earnings goes towards income taxes. In the example, the user's marginal tax rate is 30%.

Capital gains tax rate (%) The tax rate on capital gains (i.e., the appreciated land value) at the end of the horizon. For example, capital gains tax is assessed in year five of the five-year analysis. The capital gains tax rate used in the example is 20%.

After-tax discount rate (%) (atdr) The discount rate used to calculate the present value of future cash flows. One method for calculating the atdr is to use the before-tax discount rate (dr), or interest rate, and the marginal tax rate (mtr) with the following equation: $atdr = dr \times (1 - mtr)$. Using this approach with $dr = 8.6\%$ and $mtr = 30\%$ from the example, the user's atdr is: $8.5\% \times (1 - 30\%) = 0.06$ The "before-tax" discount rate (dr) represents the opportunity cost of money.

For operations with debt, the discount rate may be a blend of debt costs and equity capital. The blended rate may also need to be adjusted to reflect the risk inherent in the investment. For farms with no debt, the discount rate may be the return of off-farm investments, such as a CD rate.

For example, if the user has an operating loan being charged an interest rate of d (12%) and has a savings account earning interest of e (4%), the “blended” before-tax discount rate may be found using the following equation: $d \times (\text{debt/asset}) + e \times (\text{equity/asset}) = \text{dr}$ or $12\% \times (0.5/1) + 4\% \times (0.5/1) = 8\%$.

Solver Information

Investment yield sensitivity range (%) The value used to determine the range used in sensitivity analysis for investment yields. For example, an entry of 2% would result in maximum bid prices being calculated for investment yields of 1% below and 1% above the specified discount rate (a total range of 2%). A yield sensitivity range is 2% and a discount rate is 6% is used in this example. This means that the maximum bid prices will be calculated for investment yields with discount rates of 5-7%.

Cash flow sensitivity range (%) The value used to determine the range used in cash flow sensitivity analysis. For example, an entry of 10% would result in maximum bid prices being calculated for changes in the initial stated cash flow level of 5% above and 5% below the initial cash flow, or a 10% range. In the example, the user chose a cash flow sensitivity range of 10% and entered an initial cash flow of \$135. Thus, maximum bid prices are reported for the cash flow range of \$128 (5% below \$135) to \$142 (5% above \$135).

Results, Tables & Reports, and Charts

The Land Purchase Analysis program generates a results section, multiple tables and reports, as well as charts.

Results

On the Main Menu, the “Results” table is located in the input section. It provides analysis for six sections:

- Net present value for the analysis price
- Maximum bid price
- Investment yield for the analysis price
- The initial cash flow needed to achieve the desired yield
- The cash flow growth rate needed to achieve the desired yield
- The appreciation rate needed to achieve the desired yield

The table is shown below along with descriptions of each section.

Results			
Net Present Value: Analysis Price		Maximum Bid Price	
5 year investment horizon	(103.5)	5 year investment horizon	\$2,156
10 year investment horizon	(147.1)	10 year investment horizon	\$2,281
30 year investment horizon	(228.1)	30 year investment horizon	\$2,429
Investment Yield: Analysis Price		Initial Cash Flow Needed to Achieve Desired Yield	
5 year investment horizon	3.71%	5 year investment horizon	\$168.2
10 year investment horizon	4.54%	10 year investment horizon	\$160.3
30 year investment horizon	5.36%	30 year investment horizon	\$151.9
Cash Flow Growth Rate Needed to Achieve Yield		Appreciation Rate Needed to Achieve Desired Yield	
5 year investment horizon	16.88%	5 year investment horizon	4.09%
10 year investment horizon	7.85%	10 year investment horizon	3.88%
30 year investment horizon	4.15%	30 year investment horizon	3.75%

Net Present Value: Analysis Price

This section shows the net present value (NPV) of the bid price during an investment horizon of 5, 10, and 30 years. Net present value is the sum of the present values of future cash flows. In the above example, the NPV is negative for all investment periods. This means the rate of return for the land purchase is less than the specified discount rate. Or, stated differently, the sum of the cash flows in present value terms is negative.

Maximum Bid Price

The model uses time value of money concepts to calculate maximum bid prices. The maximum bid price is the initial investment value that would provide the investor a return equal to the specified after-tax discount rate. For example, consider a maximum bid price of \$2,281 for a 10-year period and a 6% discount rate. The user will gain the same wealth by investing the farmland's down payment in an asset with a 6% after-tax rate of return for 10 years as if the user was willing to pay \$2,281 for the farmland.

The model provides maximum bid prices for investment horizons of 5, 10, and 30 years. In this example, the maximum bid prices are \$2,156 per acre for 5 years, \$2,281 per acre for 10 years, and \$2,429 per acre for 30 years.

Investment Yield: Analysis Price

This section shows the after-tax investment yield, or return, of the analysis price over an investment horizon of 5, 10, and 30 years. In the example, the investment yield is 3.71% for 5 years, 4.54% for 10 years, and 5.36% for 30 years. This indicates that at an analysis price of \$2,800 per acre, an after-tax return of 3.71% is achieved for a horizon of 5 years.

Initial Cash Flow Needed to Achieve Desired Yield

This section shows the cash flow needed in the first year to make the analysis price profitable (or equal to the bid price). The initial cash flow will increase at the specified **annual cash flow growth rate (%)**. In this example, \$168.20 is needed in year 1 for a land purchase of \$2,800 with a discount rate of 6% and 5-year horizon to be profitable.

Cash Flow Growth Rate Needed to Achieve Yield

This section shows the growth rate in cash flows that is needed to make the analysis price profitable (or equal to the bid price) at the cash flow levels entered in **additional cash flows: year 1**. In this example, at a level of \$135 per year in additional cash flows, an annual growth rate of 16.88% in cash flows is needed to make the \$2,800 analysis price profitable after 5 years.

Appreciation Rate Needed to Achieve Desired Yield

This is the annual change in land values needed to make the analysis price profitable (or equal to the bid price) given the cash flow and cash flow growth rates entered in the Main Menu. In the example, with a yearly cash flow of \$135 and a growth rate of 3%, an increase in land values of 4.09% is needed for the \$2,800 analysis price to be profitable after 5 years.

Tables & Reports

The Land Purchase Analysis program generates a set of tables as well as cash flow reports.

Sensitivity Analysis Tables

Six sensitivity tables are included in this section:

- Maximum bid price
- Bid prices at alternative after-tax investment yields
- Cash flow sensitivity analysis at after-tax investment yields
- Bid prices at alternative growth rates
- Initial cash flow needed to achieve yield
- The growth rates of cash flows and land values needed to achieve after-tax investment yields

Maximum Bid Price

This table displays the maximum bid prices for each investment horizon. This information is the same as the information provided in the Results section.

Maximum Bid Price	
5 Year Horizon	\$2,156
10 Year Horizon	\$2,281
30 Year Horizon	\$2,429

Bid Prices at Alternative After-Tax Investment Yields

This table displays the bid prices for each investment horizon with respect to the after-tax investment yields. The after-tax investment yields, or discount rates, are calculated using the “investment yield sensitivity range” input from the Solver Information section and the “after-tax discount rate” entered in the Investor Information section. In the example, the discount rate is 6% and the sensitivity range is 2%. Thus, the discount rates used in the sensitivity table below are 1% above (7%) and below (5%) the 6% discount rate because the sensitivity range is 2%. In this box below, a bid price of \$2,208 is calculated for a user who has an after-tax discount rate of 6.5% and an investment horizon of 30 years. A reduction in the discount rate to 5.5% causes the bid price to increase to \$2,708.

Bid Prices at Alternative After-tax Investment Yields					
	After-tax Investment Yield				
	5.0%	5.5%	6.0%	6.5%	7.0%
5 Year Horizon	2,396	2,269	2,156	2,053	1,960
10 Year Horizon	2,611	2,434	2,281	2,146	2,027
30 Year Horizon	3,068	2,708	2,429	2,208	2,028

Cash Flow Sensitivity Analysis @ After-Tax Investment Yield

This table displays bid prices for each investment horizon with respect to changes in the initial net cash flow levels at the specified after-tax discount rate. The change in cash flow is calculated using the “cash flow sensitivity range” input from the Solver Information section and the “additional cash flows” input in the Land Information section. In the example, the user estimates the additional cash flows to be \$135 and the sensitivity range to be 10%. Thus, the cash flows used in this analysis range from \$128 (5% below \$135) to \$142 (5% above \$135). In the box below, a 2.5% increase in the initial cash flow level (\$135 to \$138) caused the bid price for a 5-year horizon to increase from \$2,156 to \$2,221. So, by increasing the cash flows slightly (\$3), a user can increase the bid price (\$65).

Cash Flow Sensitivity Analysis @ After-tax Investment Yield = 6.0%					
Net Cash Flow ->	Change in Initial Net Cash Flow				
	-5.0%	-2.5%	0.0%	2.5%	5.0%
	128	132	135	138	142
5 Year Horizon	2,025	2,090	2,156	2,221	2,287
10 Year Horizon	2,142	2,212	2,281	2,350	2,420
30 Year Horizon	2,282	2,356	2,429	2,503	2,577

Bid Prices at Alternative Growth Rates

This table displays the bid prices associated with the growth rates of cash flows and land values that make the analysis price profitable (or equal to the bid price). In this example, for a 10-year horizon, a bid price of \$1,530 will be profitable if the growth rate of the cash flows and land values equal 1.0%,

instead of the growth values entered in the input section (cash flows = 3% and land values = 3%).

Bid Prices at Alternative Growth Rates				
Growth rate ->	Growth Rate: Net Cash Flows & Land Values			
	0.0%	1.0%	3.0%	5.0%
5 Year Horizon	1,284	1,484	2,156	3,935
10 Year Horizon	1,313	1,530	2,281	4,465
30 Year Horizon	1,317	1,556	2,429	5,428

Initial Cash Flow Needed to Achieve Yield

The table shown below displays the initial annual cash flow needed to achieve a required return. The desired after-tax investment yields, or discount rates, are calculated using the “investment yield sensitivity range” input from the Solver Information section and the “after-tax discount rate” entered in the Investor Information section. In the example, the discount rate is 6% and the sensitivity range is 2%. Thus, the discount rates are 1% above (7%) and below (5%) the 6% discount rate because of the 2% sensitivity range. In order to make the analysis price of \$2,800 profitable at a desired return of 5%, the yearly cash flows of \$143 per year for 10 years is needed.

The 3.71%, 4.54%, and 5.36% are the actual return on the investment from the information entered in the program. For example, given the first-year cash flows of \$135 for a 10-year horizon, the actual return is 4.54%.

Analysis price = \$2,800	Initial Cash Flow Needed to Achieve Yield			
	After-tax Investment Yield	5.0%	6.0%	7.0%
5 Year Horizon	3.71%	153.7	168.2	182.6
10 Year Horizon	4.54%	143.0	160.3	177.3
30 Year Horizon	5.36%	125.3	151.9	177.3

Growth Rates:

Cash Flow and Land Values Needed to Achieve After-Tax Investment Yield

The table shown below displays the growth rates needed in yearly cash flows **and** land values to achieve a required return. The after-tax investment yields, or discount rates, are calculated using the “investment yield sensitivity range” input from the Solver Information section and the “discount rate” entered in the Investor Information section. The discount rate is 6% and the sensitivity range is 2%. Thus, the discount rates are 1% above (7%) and below (5%) the 6% discount rate because of the 2% sensitivity range. In this example, the analysis price is \$2,800 and the net cash flow is \$135. A growth rate of 4.29% in yearly cash flows **and** land values is needed to make the analysis price (\$2,800/acre) profitable if the user’s required return is 7% and he or she plans to hold the investment for 10 years.

Analysis price = \$2,800 Net cash flow = \$135	Growth Rates :Cash Flows & Land Values Needed to Achieve After-Tax Investment Yield		
	After-tax Investment Yield ->	5.0%	6.0%
5 Year Horizon	3.57%	4.02%	4.47%
10 Year Horizon	3.24%	3.76%	4.29%
30 Year Horizon	2.73%	3.48%	4.22%

5-, 10-, and 30-year Cash Flow Worksheets

Each worksheet contains a detailed CASH-FLOW report. The reports include: net cash flows, property taxes and amortized closing costs, debt payments, debt outstanding, interest payments, down payment and principal payments, after-tax cash flows, capital gains tax, land value, the ending debt value, and the net after-tax cash flows.

An example of each calculation is provided for the 5-year horizon model.

Net cash flows represent the sum of cash inflows received by the investment as well as the cash outflows used for expenditures and taxes. This is calculated using the entries for the cash-flow growth rate and the net cash flows in year 1. Using the table above, the calculation for *net cash flows* is

Property taxes and amortized closing costs represent the property taxes owed each year accounting for the yearly increases, as well as the amortized closing costs. This is calculated using the entries for the cash-flow growth rate, property taxes for year 1, analysis price, analysis horizon, and closing fees. For example, the *property taxes and amortized closing costs* for year 1 is \$30.

Debt payments are the scheduled amount required each pay period to reduce the loan. They consist of interest and principal.

Debt outstanding refers to the amount remaining to be paid for the loan and interest. For year one, *debt outstanding* is calculated using the entries for the analysis price and amount financed. For year two and beyond, *debt outstanding* is calculated using the entries for the amount outstanding from the previous year and the principal payment from the previous year. The *debt outstanding* for year 1 is \$1,960.

Interest payments refer to the portion of the debt payment that does not reduce principal. *Interest* is calculated using the annual interest rate entry and the debt outstanding amount in the current year.

Down payment refers to the portion of the original purchase price that was not financed with debt. It is calculated using the entries for analysis price and down payment.

Principal payments refer to the portion of the debt payments that reduce the amount of outstanding debt. The payments are calculated using the debt payment and interest payment amounts recorded for the current year.

After-tax cash flows refer to the sum of the cash outflows and inflows after accounting for property taxes and amortized closing costs. They are calculated using the net cash flows, property taxes, amortized closing costs, and interest payments.

The *capital gains tax* is the amount of taxes owed after selling a capital asset. For example, in year 5, the capital gains tax is \$83.

The *land value* is the estimated value of the land after accounting for appreciation in land values.

Ending debt value is the remaining debt owed at the end of the analysis.

Net after-tax cash flows are the sum of the cash inflows and outflows after accounting for capital gains tax and remaining debt at end of the analysis.

5-Year Horizon



Print
5 Year

		Return to Main 5 gear horizon											Return to Main
		Net	Property Taxes and Amortized Closing Costs	Debt Payments	Debt Outstanding	Interest Payments	Downpayment & Principal Payments	After Tax Cash Flows	Capital Gains Tax	Land Value	Price Ending Debt Value	Price After Tax Cash Flows	\$2,800 Net After
Year		Cash Flows											
Initial Investment	0						840						(868)
	1	135	30	200	1,960	157	43	(73)		2,884			(73)
	2	139	30	200	1,917	153	46	(72)		2,971			(72)
	3	143	31	200	1,871	150	50	(71)		3,060			(71)
	4	148	32	200	1,821	146	54	(69)		3,151			(69)
Terminal Value	5	152	33	200	1,767	141	58	(101)	83	3,246	1,709		1,354

10-Year Horizon



Print
10 Year

		Return to Main 10 gear horizon											Return to Main
		Net	Property Taxes and Amortized Closing Costs	Debt Payments	Debt Outstanding	Interest Payments	Downpayment & Principal Payments	After Tax Cash Flows	Capital Gains Tax	Land Value	Price Ending Debt Value	Price After Tax Cash Flows	\$2,800 Net After
Year		Cash Flows											
Initial Investment	0						840	(840)					(868)
	1	135	27	200	1,960	157	43	(74)		2,884			(74)
	2	139	28	200	1,917	153	46	(73)		2,971			(73)
	3	143	28	200	1,871	150	50	(71)		3,060			(71)
	4	148	29	200	1,821	146	54	(70)		3,151			(70)
	5	152	30	200	1,767	141	58	(69)		3,246			(69)
	6	157	31	200	1,709	137	63	(68)		3,343			(68)
	7	161	31	200	1,646	132	68	(67)		3,444			(67)
	8	166	32	200	1,578	126	73	(65)		3,547			(65)
	9	171	33	200	1,504	120	79	(64)		3,653			(64)
Terminal Value	10	176	34	200	1,425	114	86	(101)	185	3,763	1,340		2,138

30-Year Horizon

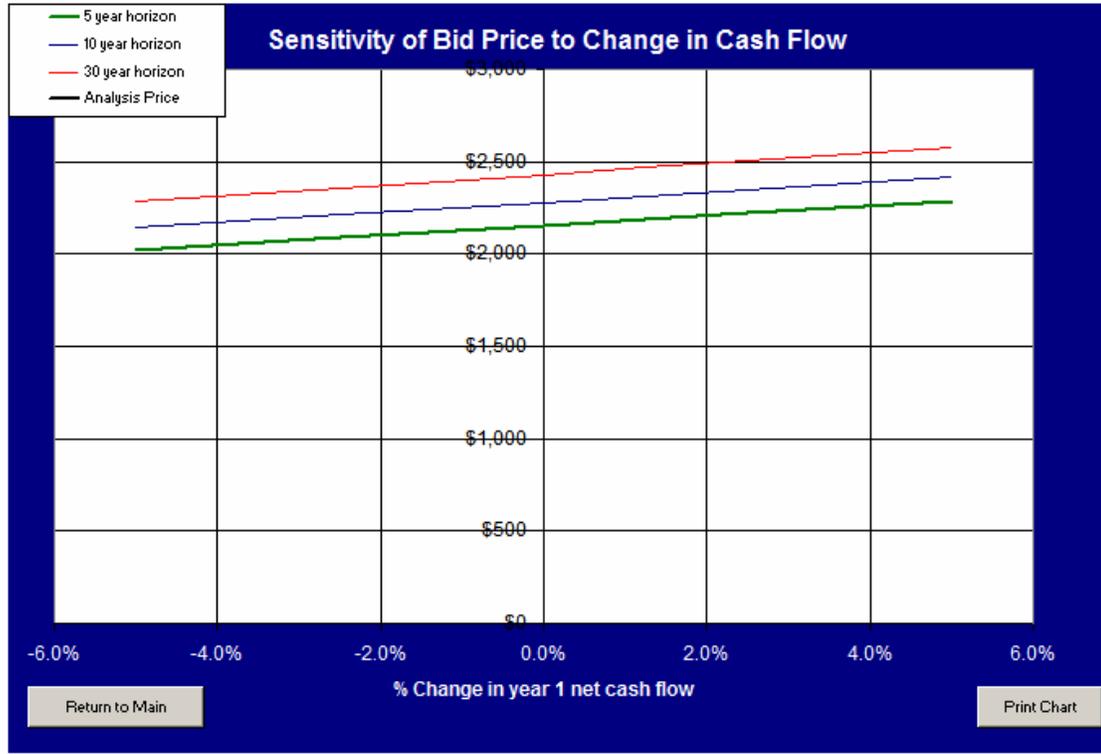


		30 year horizon											\$2,800.0
		Property Taxes	Debt	Debt	Interest	Downpayment &		After Tax	Capital	Price		\$2,800.0	
		and Amortized	Payments	Outstanding	Payments	Principal	Cash Flows	Cash Flows	Gains Tax	Land Value	Ending	Net After	
		Closing Costs									Debt Value	Tax Cash Flows	
Year	Net Cash Flows												
0	Initial Investment						840	(840.0)				(868)	
1	135	25	200	1,960	157	43		(75)		2,884		(75)	
2	139	26	200	1,917	153	46		(73)		2,971		(73)	
3	143	26	200	1,871	150	50		(72)		3,060		(72)	
4	148	27	200	1,821	146	54		(71)		3,151		(71)	
5	152	28	200	1,767	141	58		(69)		3,246		(69)	
6	157	29	200	1,709	137	63		(68)		3,343		(68)	
7	161	30	200	1,646	132	68		(67)		3,444		(67)	
8	166	30	200	1,578	126	73		(66)		3,547		(66)	
9	171	31	200	1,504	120	79		(65)		3,653		(65)	
10	176	32	200	1,425	114	86		(64)		3,763		(64)	
11	181	33	200	1,340	107	92		(63)		3,876		(63)	
12	187	34	200	1,247	100	100		(62)		3,992		(62)	
13	192	35	200	1,147	92	108		(61)		4,112		(61)	
14	198	36	200	1,039	83	116		(60)		4,235		(60)	
15	204	37	200	923	74	126		(60)		4,362		(60)	
16	210	38	200	797	64	136		(59)		4,493		(59)	
17	217	39	200	661	53	147		(59)		4,628		(59)	
18	223	41	200	514	41	158		(59)		4,767		(59)	
19	230	42	200	356	28	171		(59)		4,910		(59)	
20	237	43	200	185	15	185		(59)		5,057		(59)	
21	244	44	-	-	-	-		141		5,209		141	
22	251	46	-	-	-	-		145		5,365		145	
23	259	47	-	-	-	-		149		5,526		149	
24	266	48	-	-	-	-		154		5,692		154	
25	274	50	-	-	-	-		158		5,863		158	
26	283	51	-	-	-	-		163		6,038		163	
27	291	53	-	-	-	-		168		6,220		168	
28	300	54	-	-	-	-		173		6,406		173	
29	309	56	-	-	-	-		178		6,598		178	
30	Terminal Value	318	57	-	-	-		115	786	6,796	-	6,126	

Charts

Cash Flow Chart: Sensitivity of Bid Price to Change in Cash Flow

This chart maps the relationship of bid price to the percent change in cash flows for the first year of the analysis. The lines represent the combination of yearly cash flow and bid prices that equal a return equivalent to that of the discount rate. In this example, the three lines representing the time horizons slant slightly upward as net cash flow increase. For example, with a 0% change in cash flows in year one, the bid price for a 30-year property (red or top line) is \$2,429. With a 5% increase in cash flows in year one, the bid price is increased to \$2,577. However, with a 5% decrease in cash flows in year one, the bid price is \$2,282. Thus, as cash flows increase, bid prices increase.



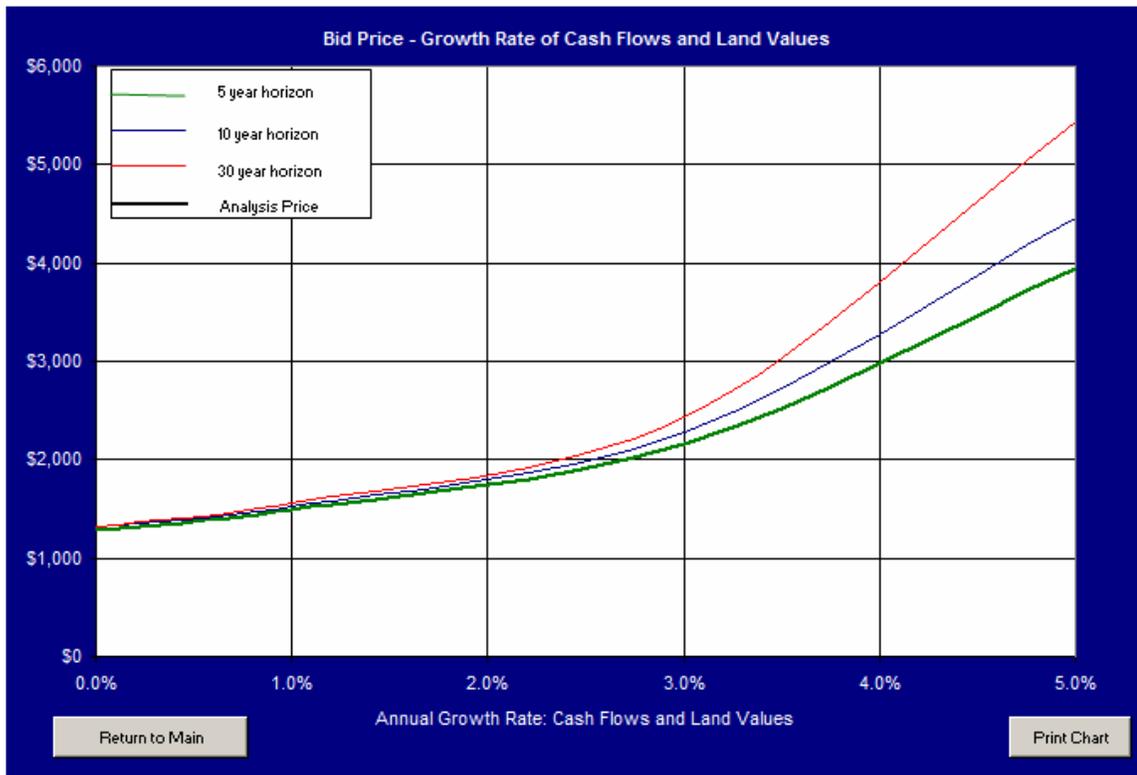
Yield Chart: Bid Price Versus Investment Yields

This chart maps the relationship between maximum bid prices and discount rates for each of the investment horizons. For example, at 5.5%, the 5-year horizon requires a \$2,268 bid price; however, at 6.5%, the bid price is \$2,053. Thus, as the after-tax investment yield increases, the required bid price decreases.



Growth Chart:***Bid Price Versus Annual Growth Rate of Cash Flows and Land Values***

This chart shows the relationship of maximum bid prices to the annual growth rate of cash flows and land values that make the analysis price profitable (or equal to the bid price). In this example, the lower the line, the lower the bid price per growth rate that is needed to make the analysis price profitable. For example, at a 1% growth rate, the 30-year horizon has a bid price of \$1,556, while at a 5% growth rate; the bid price is \$5,428.

**Land Purchase Input Completion Form**

This form will assist in organizing the information required to use the Land Purchase Analysis. This page provides an example of how the form may be used. Three scenarios have been generated using the Land Purchase Analysis program. *A blank form is provided on the next page.*

The three scenarios are described below, while the changes in each scenario are highlighted.

Option 1: Example used in manual

Option 2: Decrease interest rate from 8% to 6.5%

Option 3: Increase cash flow in year 1 from \$135 to \$200

Land Information

	Option 1	Option 2	Option 3
Analysis Price	\$2,800	\$2,800	\$2,800
Additional Cash Flows	\$135	\$135	\$200
Property Taxes	\$24	\$24	\$24
Cash Flow Growth Rate (%)	3%	3%	3%
Land Value Appreciation (%)	3%	3%	3%
Closing Fees (%)	1%	1%	1%
Selling Fees (%)	1%	1%	1%

Financing Information

Down Payment (%)	30%	30%	30%
Interest Rate (%)	8%	6.5%	8%
Length of Loan (years)	20 yrs	20 yrs	20 yrs

Investor Information

Marginal Tax Rate (%)	30%	30%	30%
Capital Gains Tax Rate (%)	20%	20%	20%
After-Tax Discount Rate (%)	6%	6%	6%

Solver Information

Investment Yield Sensitivity Range (%)	2%	2%	2%
Cash Flow Sensitivity Range (%)	10%	10%	10%

RESULTS

Maximum Bid Price (5 years)	\$2,156	\$2,636	\$3,418
Maximum Bid Price (10 years)	\$2,281	\$2,736	\$3,616
Maximum Bid Price (30 years)	\$2,429	\$2,690	\$3,582
Net Present Value (5 years)	(\$103.50)	(\$21.50)	\$99.30
Net Present Value (10 years)	(\$147.10)	(\$15.00)	\$231.40
Net Present Value (30 years)	(\$228.10)	(\$61.20)	\$647.50

The **results** menu reports the maximum bid prices and net present values for a comparison of Option 1 to the others. When comparing Option 1 and Option 2, there is a decrease in the interest rate, increased bid prices and higher net present values. However, in Option 3, the interest rate remained the same, but cash flows in the first year were increased. This increased bid prices even more than Option 2 and created positive net present values.

Land Purchase Input Completion Form

**This form will assist in organizing the information required to use the Land Purchase Analysis*

Land Information

	Option 1	Option 2	Option 3
Analysis Price			
Additional Cash Flows			
Property Taxes			
Cash Flow Growth Rate (%)			
Land Value Appreciation (%)			
Closing Fees (%)			
Selling Fees (%)			

Financing Information

Down Payment (%)			
Interest Rate (%)			
Length of Loan (years)			

Investor Information

Marginal Tax Rate (%)			
Capital Gains Tax Rate (%)			
After-Tax Discount Rate (%)			

Solver Information

Investment Yield Sensitivity Range (%)			
Cash Flow Sensitivity Range (%)			

RESULTS

Maximum Bid Price (5 years)			
Maximum Bid Price (10 years)			
Maximum Bid Price (30 years)			
Net Present Value (5 years)			
Net Present Value (10 years)			
Net Present Value (30 years)			