

JAMES A. GRAASKAMP COLLECTION OF TEACHING MATERIALS

V. INDUSTRY SEMINARS AND SPEECHES - SHORT TERM

I. Other Presentations In Which Either The Date And /
Or Sponsoring Organization Is Missing

2. Appraisal Topics

r. "Ellwood Analysis", February 21, 1976

2/21/76

Ellwood Analysis

A program to perform Ellwood computations using formula specified by L. W. Ellwood in Ellwood Tables for Real Estate Appraising and Financing, Third Edition. The program is not constrained to the projection periods and rates tabulated but may be used for fractional periods and rates.

Program Name: ELLWOOD

Inputs Required:

NOTE: Entry of a question mark in response to any request by the program for data will cause a more elaborate explanation of the required entry to be printed.

EQ YLD? (Required) Equity Yield rate stated either as a percentage or a decimal fraction. All values which are rates may be specified in this manner. If a value larger than one is entered the program assumes that the entry is stated as a percentage and will be divided by 100 to obtain the decimal rate.

PROJ PD? (Required) Projection period stated in years.

For each mortgage the following data is required:

MTG INTR? (Optional) The mortgage interest rate stated as a percentage or decimal fraction. If data for all mortgages have already been entered then the proper response is no entry followed by a carriage return. The program will request no further mortgage data, and proceed with the analysis.

MTG PD? (Optional) Remaining mortgage period in years. If the mortgage is unknown the annual constant will subsequently be required and requested. Press return without entering data if period is unknown.

MTG CON? (Optional) The mortgage constant; the total annual payments for principal and interest as a fraction of the current mortgage balance should be entered here. If no entry is made the program will repeat the request for mortgage period above.

- PMT PDS/YR? (Required) The number of payment periods per year for a monthly payment mortgage enter 12. For a quarterly payment mortgage enter 4.
- M? (Optional) The fraction of value which is mortgaged by the current mortgage. If no entry is made program will request the dollar amount of the mortgage below.
- M\$? (Optional) The dollar value of the current principal outstanding on the mortgage. If no entry is made the program will again request the mortgage as a fraction of the value of the property above.

The following data is requested after all mortgage data above has been entered.

- %DEPR (-APPR) (Required) The percent of depreciation over the projection period on the basis of the current value. If property value is expected to increase, that is appreciate, enter the amount of appreciation as a negative percentage. If property value is to remain constant enter zero.
- INC? (Required) The annual income derived from the investment.
- %INCR INCOME (Required) The amount by which the annual income is to increase during the projection period on the basis of the currently stated income above. If income is to remain constant enter zero.
- EF.R.E.TX.R? The annual real estate tax payment expressed as a percent of market value.

MODE?

Enter one of the following:

- r
- R Restart; return to the beginning of the program requesting equity yield.
- C Provide a mechanism for making changes. Program will continue with the change option described below.
- Q Quit; the program will terminate.
- P Proof; the program will printout a complete description of the analysis showing the computations normally used in an Ellwood analysis to arrive at the value stated.
- T Table; the program will request additional data so as to prepare a table of appreciation or depreciation associated with various choices of projection periods and equity rates. This table may be used to prepare the "Ellwood graphical analysis". In this table negative entries denote depreciation (and, optionally, income decline). This notation agrees with the (inconsistent) notation in the Ellwood text.

#,NEW VAL

(Optional) Enter the number of the item which is to be corrected and its new value. The numbers associated with data items previously entered will have been printed ahead of the abbreviated request for input. These numbers may be used at this point. The number must be followed by a comma and the new value to be used. Upon making one entry the program will again request another number and new value. To terminate this mode make no entry and press return.

Introductory Ellwood Case #1

The Old Dog Appraisal Company has been asked to provide an income appraisal, complete with an Ellwood graph of possible yields and a proof, to value an investment in a well-built industrial building yielding a net income of \$36,000 per year. The investor feels a 5-year projection is sufficient. The client-investor wants the analysis in 30 minutes so that he can make an offer that afternoon. Investors expect a 20% yield to equity before taxes on this type of investment and the appraiser anticipates a 2% decline in resale value of the property each year. Financing includes both a first and a second mortgage as follows:

	1st Mortgage	2nd Mortgage
Interest Rate	.085	.09
Term	20	
Debt Service Constant		.123
M (Mortgage Ratio)	.60	
M\$ (Mortgage Amount)		20,000
Payment Periods/Year	4	12
%Depreciation	.10	

Fortunately Old Dog has a smart son home from college who runs the problem for him on the terminal and provides the output which follows this explanation. Later in the dead of night, Old Dog decides to see if he can repeat the results by doing the very same routine himself.

Instructions:

- Step 1 - Find a terminal and if its not connected to a telephone adopt a smart son-of-an-assistant.
- Step 2 - Have assistant guide you in "logging in" (details and drill on this step will be provided Monday morning).
- Step 3 - As the terminal asks questions, make all the entries indicated on the example in hand.
- Step 4 - When you have completed the entire run, read back through the program to see if you can crack the code or cryptic notations:
 - a. For example: What is the purpose of entering a question mark (?)?
 - b. What is "mode"?
 - c. Did you enter any percentages as 9 instead of .09? Did it work? Why?
 - d. Does typing 0 (zero) mean the same thing as entering nothing?

- e. How do you indicate the number of mortgages to the program?
- f. How do you specify a mortgage as a % of valuation vs. a particular dollar amount?

Step 5 - Rest on your laurels. Tomorrow is another day!

OLD ELLWOOD

(Terminal inputs are underlined)

READY
RUN-10

ELLWOOD 17:10CST 02/20/76

REVISED 6/17/75

You may enter a "?" to get a more complete description of any of these questions.

Examples

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1 EQ YLD? ?
EQUITY YIELD RATE DESIRED
1 EQ YLD? .20
2 PROJ PD? 5
MORTGAGE 1 DATA
4 MTG INTR? .085
5 MTG PD? 20
7 PMT PDS/YR? 4
10 M? ?
MORTGAGE AMT AS A % OF VALUE, IF UNKNOWN PRESS RETURN
10 M? .60
MORTGAGE 2 DATA
14 MTG INTR? .09
15 MTG PD?     
16 MTG CON? .123
17 PMT PDS/YR? 12
20 M?     
21 M$? 20000
MORTGAGE 3 DATA
24 MTG INTR?     
52 ZDEPR(-APPR)? .10
55 INC? 36000
53 % INCR INCOME? 0
58 EF.R.E.TX.R.? .195
.1116310 = MTG 1 C
.1048726 = MTG 2 C
.1249581 = BASIC RATE
.3333960 = OVERALL RATE
107979 = VALUATION

```

indicates that only "return" was entered

MODE? P

MORTGAGE1	60%	64788 AT .1044	6765
MORTGAGE2	19%	20000 AT .1230	2460
EQUITY	21%	23191 AT .2466	5718
		R.E. TAXES	21056
TOTAL		107979	36000 INCOME

107979 ORIGINAL PRICE
10797 LESS 10.% DEPRECIATION

97181 PROPERTY REVERSION, DEFERRED 5 YEARS
64788 MORTGAGE 1
57050 7738 LESS 5 YEAR AMORTIZATION; (0.119433)
20000 MORTGAGE 2
15852 4148 LESS 5 YEAR AMORTIZATION; (0.207416)

24279 EQUITY REVERSION, DEFERRED 5 YEARS

PRESENT VALUE OF EQUITY INCOME AND REVERSION AT 20.%

17103 INCOME, 5718.91 X 2.99061
9757 REVERSION, 24279.7 X 0.401878

26860 TOTAL

MODE? I

IS INCOME CONSTANT? YES
ENTER OVERALL RATE FOR ANAL.? .138396
ENTER 1 TO 4 PROJ. PDS? 2,5,8,10
ENTER 1 TO 6 EQ. YLDS? 5,10,15,20,25

YIELD ANALYSIS WITH
CONSTANT INCOME, .1383960 = R

YRS	2	5	8	10
YIELD				
.0500	-.1341	-.3699	-.6499	-.8653
.1000	-.1020	-.2939	-.5471	-.7594
.1500	-.0700	-.2044	-.3967	-.5696
.2000	-.0381	-.1000	-.1839	-.2565
.2500	-.0063	.0211	.1094	.2336

MODE? T
 IS INCOME CONSTANT? NO
 ENTER OVERALL RATE FOR ANAL.? .138396
 ENTER 1 TO 4 PROJ. PDS? 2,5,8,10,15
 ENTER 1 TO 6 EQ. YLDS? 5,10,15,20,25

YIELD ANALYSIS WITH

VARIABLE INCOME,	.1383960 = R				
YRS	2	5	8	10	15
YIELD					
.0500	-.1109	-.2589	-.3919	-.4763	-.6847
.1000	-.0842	-.2039	-.3234	-.4064	-.6391
.1500	-.0577	-.1406	-.2303	-.2974	-.5089
.2000	-.0314	-.0683	-.1051	-.1309	-.2078
.2500	-.0052	.0143	.0615	.1170	.4132

MODE? C
 #,NEWVAL? 53,.025
 #,NEWVAL?
 .1116310 = MTG 1 C
 .1048726 = MTG 2 C
 .1249581 = BASIC RATE
 .3306836 = OVERALL RATE
 108865 = VALUATION

MODE? Q

USED 8.61 UNITS

RUN COST

COST 17:21CST 02/20/76

ACCRUED CHARGES SINCE SIGNIN

\$ 1.05 COMPUTER
 1.94 CONNECT
 0.47 CHARACTERS
 \$ 3.46 TOTAL
 EFFICIENCY = 24.4

USED .39 UNITS

BYE

00010.18 CRU 0000.19 TCH 0004.66 KC

OFF AT 17:21CST 02/20/76