

## CONSTRUCTING THE DCF

### PART 3

#### AIM

Upon completion of this lesson, the student will be able to boot in Excel and use the basic keystrokes.

#### NOTATION USED IN THESE LESSONS

<> means perform the keystroke in brackets.  
<↵> means press the Enter key

Key names are given with a starting capital letter, for example:

<NumLock> means press the NumLock key

<F1>....<F12> refers to the "F" (function) keys at the top of the keypad, eg  
<F5> means the press the "F5" key NOT <F> and then <5>.

Where 2 or 3 keystrokes are required in sequence, eg:

<Alt>+<F5> means the <Alt> key is pressed first and at the same time the <F5> key is pressed.

#### DRIVE SELECTION

For example, a: means select drive a.

#### STARTING UP IN USA's COMPUTER ROOMS

1. Turn computer on
2. Press <↵> until the network's menu comes up on screen<↵>
3. Make sure NumLock is OFF. This can be determined by the NumLock light on the top of the numeric keypad.
4. Highlight "scratchpad" for the temporary storage of information in "e" drive <↵>  
NB: Once in scratchpad mode the computer will not save a program on disk. If you wish to save on disk select drive a.

#### FORMATTING FROM THE MAIN MENU

A disk can be formatted from the MAIN MENU as follows:

- \* Select 2. DOS COMMANDS
- \* 9. Format a diskette  
Press 1. for 720 kilobytes, <↵>

After the disk has been formatted:

- \* Volume label (11 characters, Enter for none)? <↵>

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\* N <↓>

\* To return to MENU: <↓>

\* To return to MAIN MENU: <Esc>

### BOOTING INTO EXCEL

In the MAIN MENU:

\* 8. Spreadsheets <↓>

\* 3. Microsoft Excell 4.00 <↓>

The computer will boot in Excel. The Excel banner will appear and then a set of gridlines with cell addresses.

\* The Excel template will appear showing. Expand screen size: 

Columns: A - I

Rows: 1-20

NB: cell address in the top righthand corner of the spreadsheet

**MOVING THE CURSOR:** The cursor can be moved with the mouse from cell to cell. To use a cell move cursor to the required cell then click LH button on mouse. The cell address is shown on the top right hand corner of the screen.

### LOOKING AT THE SPREADSHEET

1. The cursor starts at cell A1 (Home). It can be moved about the spreadsheet by using the arrows or the mouse.

2. Move cursor to H1 and then to J2

3. At J2 note that Column A has disappeared so that the screen (window) can accommodate Column I. The spreadsheet has scrolled from right to left. At any one time (under normal format) there are 9 columns and 20 rows on a screen or window.

4. You can move back to A1 at any time using <Ctrl>+<Home>. Move back to A1.

5. Note that the Excel window is only a small part of the total spreadsheet which is very large, having 16384 rows and 256 columns. It is not likely that you will use anywhere near it's full potential.

6. Instead of using the mouse or arrow keys, the cursor can also be moved using the GOTO key <F5>:

**EXAMPLE:** To move cursor to AB1000: <F5> AB1000 <↓> or  <Ctrl>+<Home>

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### ENTERING DATA

There are two types of data:

1. Alpha (A-Z) or label or string
2. Numerical or numbers

If the first letter is alpha then Excel will interpret the input as a LABEL (in computer jargon this is also known as a "string"). If the first letter is a number then Excel will assume that the input is numerical. If you wish to withdraw a keystroke before entering use <Esc>. After entering the input can be edited using <F2>.

### CONSTRUCTING A SIMPLE DISCOUNTED CASH FLOW (DCF)

The following DCF is based on the DCF in Appraisal Two, Diagram 3-2, p 3-4. Always bear in mind the purpose of the DCF. Remember it is only a means to an end. The following cash flow is based on that shown in diagram 3-2 in Appraisal Two.

A1: FEASIBILITY  
D6: QUARTERS  
A7: ITEM  
D8: \$'000  
B7 to G7: 0,1,2,3,4,5  
I7: TOTALS  
A10: CONSULTANTS' FEES:

Note that the label encroaches onto the cash flow periods 0/1. Therefore, it is necessary to widen column A to accommodate the full label:

**CHANGE COLUMN WIDTH:** With the cursor in column A:

<Format><Column width> 24

NB that column I moves off the screen

A12: CONSTRUCTION COSTS  
A13: Building1

**COPY COMMAND:** On A13 <Edit><Copy> Highlight A14:A15 by holding the LH button down and moving the mouse <↓>

Change A14 and A15 to Building 2 and Building 3 respectively.

A17: GROUND IMPS etc:  
A19: ADVERTISING:  
A21: SELLING COSTS:  
A23: HOLDING CHARGES:  
A25: END MARKET VALUE:  
A27: TOTALS:

**UNDERLINE:** On A27: <Format><Font> In the Effects Box put a cross against underline

<↓> or

FEASDCF1.XLS

FEASIBILITY								
			QUARTERS					
ITEM	0	1	2	3	4	5	TOTALS	
			\$'000					
LAND VALUE:	(178.24)							
STAMP DUTY & LEGAL:	(6.42)							
CONSULTANTS' FEES:		(0.35)	(2.10)	(3.10)	(3.30)	(1.05)		(9.90)
CONSTRUCTION COSTS:								
Building 1	(2.00)	(4.00)	(20.00)	(30.00)	(11.00)	(1.00)		(68.00)
Building 2		(1.00)	(12.00)	(18.00)	(25.00)	(10.00)		(66.00)
Building 3		(2.00)	(10.00)	(14.00)	(30.00)	(10.00)		(66.00)
GROUND IMPS etc:					(6.00)	(12.00)		(18.00)
ADVERTISING:						(0.40)		(0.40)
SELLING COSTS:				(4.80)	(10.20)	(4.80)		(19.80)
HOLDING CHARGES:	(1.00)		(1.00)		(1.00)			(3.00)
END MARKET VALUE:					160.00	340.00		500.00
<b>TOTALS:</b>	<b>(187.66)</b>	<b>(7.35)</b>	<b>(45.10)</b>	<b>(69.90)</b>	<b>73.50</b>	<b>300.75</b>		<b>248.90</b>
Discount rate at % pa:	20	base:	1.05					

## CONSTRUCTING THE DCF

### ENTERING DATA

Now that the cash flow template has been constructed, enter the data as shown in Diagram 3-2. Note that ( ) are negative numbers being costs. All the numbers in the cash flow are negative except End Market Value (EMV).

### TOTALS FOR COLUMNS

B27: =SUM(B10:B25) <↵>

<Edit><Copy> Highlight C27:I27

<Edit><Paste Special> put a cross in Skip Blanks box <↵> or

### TOTALS FOR ROWS

I10: =SUM(B10:G10) <↵>

<Edit><Copy> Highlight I13:I25 <↵>

<Edit><Paste Special> put a cross in Skip Blanks box <↵> or

### FORMATTING THE SPREADSHEET

The negatives are not in brackets (which is most desirable as it is much clearer than the use of a negative sign) nor are the numbers at two decimal places. These matters can be rectified as follows:

Highlight A10:J27

<Format><Number> Highlight #,##0.00];[#.##0.00] <↵> or

Save the cash flow as FEASCF.XLS:

<File><Save as> a:\FEASCF.XLS <↵> or

### DISCOUNTING THE CASH FLOW

See pages 3-4/3-7 Appraisal Two.

A29: Discount rate at % pa:

B29: 10

C29: base:

D29: =1+(B29/4/100) <↵>

The base (D29) should show 1.100. Format D29 to 3 decimal places.

A31: Discount factors:

B31: =1/(D29^B7) <↵> ("^" = to the power of) = 1

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The discount factor has been calculated using the following PRESENT VALUE OF \$1 formula:

$$PV = 1/((1+i)^n)$$

Where:

PV = present value of 1  
i = interest rate as a decimal  
n = period in years.

For B31:  $1/(1.1^0) = 1$

The discount rate at period 0 is always = 1. However, instead of inputting "1" it is good practice to input the formula and if the resultant value is "1", then you know the formula is correct and you can copy it with confidence.

COPY B31 to C31..G31

We get #DIV/0! errors. Why? Look at the formula in C31:  $1/(E29^C7)$  But E29 is a blank cell! What has happened?

### RELATIVE CELL ADDRESSES

COPY moved ALL cell addresses in the formula by the number of columns between our source address B31 and target address C31. Therefore we have to fix B31 so that the reference to D29 does not change with COPY.

### FIXED CELL ADDRESSES

B31: Click onto the formula at the top. Change D29 to  $\$D\$29$

This tells Excel to fix the cell address; D29 in the formula in B31. COPY B31 to C31:G31 again.

Format to 4 decimal places:

Highlight B31:G31

<Format><Number>Highlight 0.00

Change Code box to 0.0000

Check your discount factors against those shown in Diagram 3-3, p 3-7.

### NET PRESENT VALUE (NPV)

The NPV is the sum of the Discounted Cash Flows (DCF's):

A33: DCF's:  
B33:  $=B31*B27$   
Copy B33 to C33:G33

Note that in this case we require all the addresses to be relative. Why?

FORMAT to 2 decimal places and brackets for negatives.



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A35: NET PRESENT VALUE:

B35: =SUM(B33..G33)

Format to 2 decimal places.

The answer should be about 214, a small difference can occur due to rounding.

**CONGRATULATIONS!** You have now completed a DCF.

### UNDERSTANDING YOUR SUCCESS

Although the results of the DCF will be analyzed in detail later the calculation of the NPV has provided us already with important information about the feasibility of the proposed land use:

1. It is positive. If the NPV had been a very small amount or negative there would be no need to analyze the project any further. It is not economical.
2. Just be inspection it appears to be a sizable amount. The land use definitely looks promising!

### DETERMINING LAND VALUE

If the 10% is sufficient return on investment then the land value in the developer's name is 214 000. To determine the market value see pages 3-7/3-9, Appraisal Two. Change the discount rate to 20% per annum to construct the cash flow shown in Diagram 3-4. What is the ultimate land value?

### COURTS AND DCF

See page 3-9 Appraisal Two. See article; "Decision making in valuation - a comparison between court judgments and valuation education/research" at the end of this part.

### SAVING THE WORKSHEET

Worksheets should be saved frequently so that if anything untoward happens to the computer or a "bug" appears in the program the majority of the work is not lost. To save on disk you must have a "formatted" disk in a: To save you must go into the Excel MENU:

1. <File> <Save as> Enter:

a:feasdcf.xls

2. To check that the file has been saved:

<File> <Save as>

This will show the current menu in the files directory. Check that the previously saved file is listed there. **THIS IS IMPORTANT.** Should always check and make sure that the file has been saved in a: You may have inadvertently saved onto the scratchpad e:. Also watch for a:'s red light which comes on when a: is being used.

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### ADDING THE LAND VALUE TO THE SPREADSHEET

So far we have treated land value as something which the DCF provides us through the NPV. However, to construct a complete feasibility study it is better to include land value directly on the spreadsheet:

**ADD ROWS:** Highlight A9:A12  
<Edit><Insert>

Enter a cross in the box against Entire Row <Alt> or

A10: LAND VALUE:  
A12: STAMP DUTY & LEGAL:  
B10: -178.24  
B12: =B10\*.036

Format B10:B12 for brackets and 2 decimal places.

At B31 the totals need readjusting to include the new rows. Change to:

=SUM(B10:B29)

Note that the NPV now approximates 0. Error is due to rounding. Therefore, 20% is the IRR because by definition IRR is that discount rate which produces an IRR = 0.

The resulting cash flow should be similar to that in Diagram 4-1, Appraisal Two, p4-1.

Save as FEASDCF1.XLS.

### WHAT IF ?

According to your feasibility you are prepared to bid 178 000 for the subject site at the auction. However, suppose the opposition has not done their homework and you are able to buy the site for 150 000. How will this affect your NPV? What is the new IRR?

On the other hand the site is handed down to the opposition for 200 000. What IRR are they working on?

### FINISHING UP

1. <File> <Exit>

