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CPD accredited Valuation course following Conference on

"Real Estate Valuation Updates – the essential guide forward".

Rather than providing a snapshot of the market value of a property asset, valuers can provide strategic advice over the long term.

Valuers have to move from the technical to the strategic role

October 2004

Course co-ordinator:
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PROPERTY GROWTH RATES

MODULE I

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October 2004

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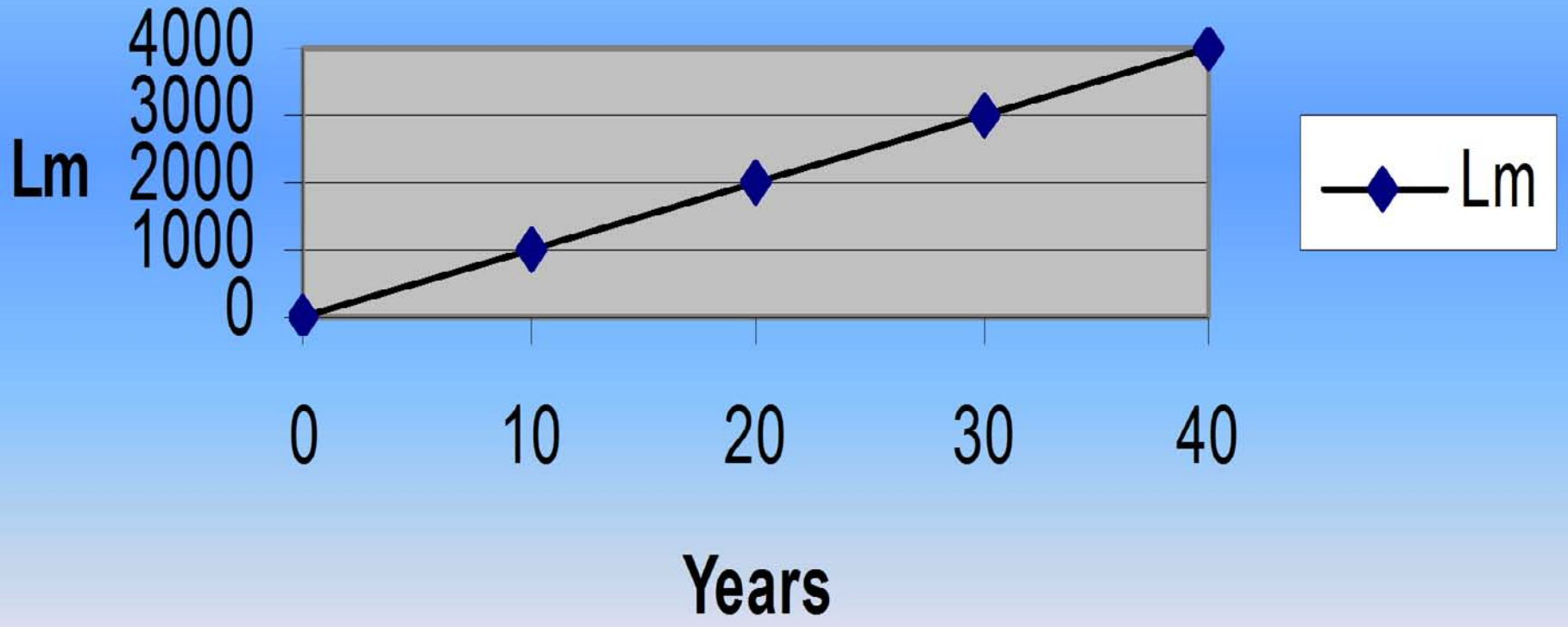
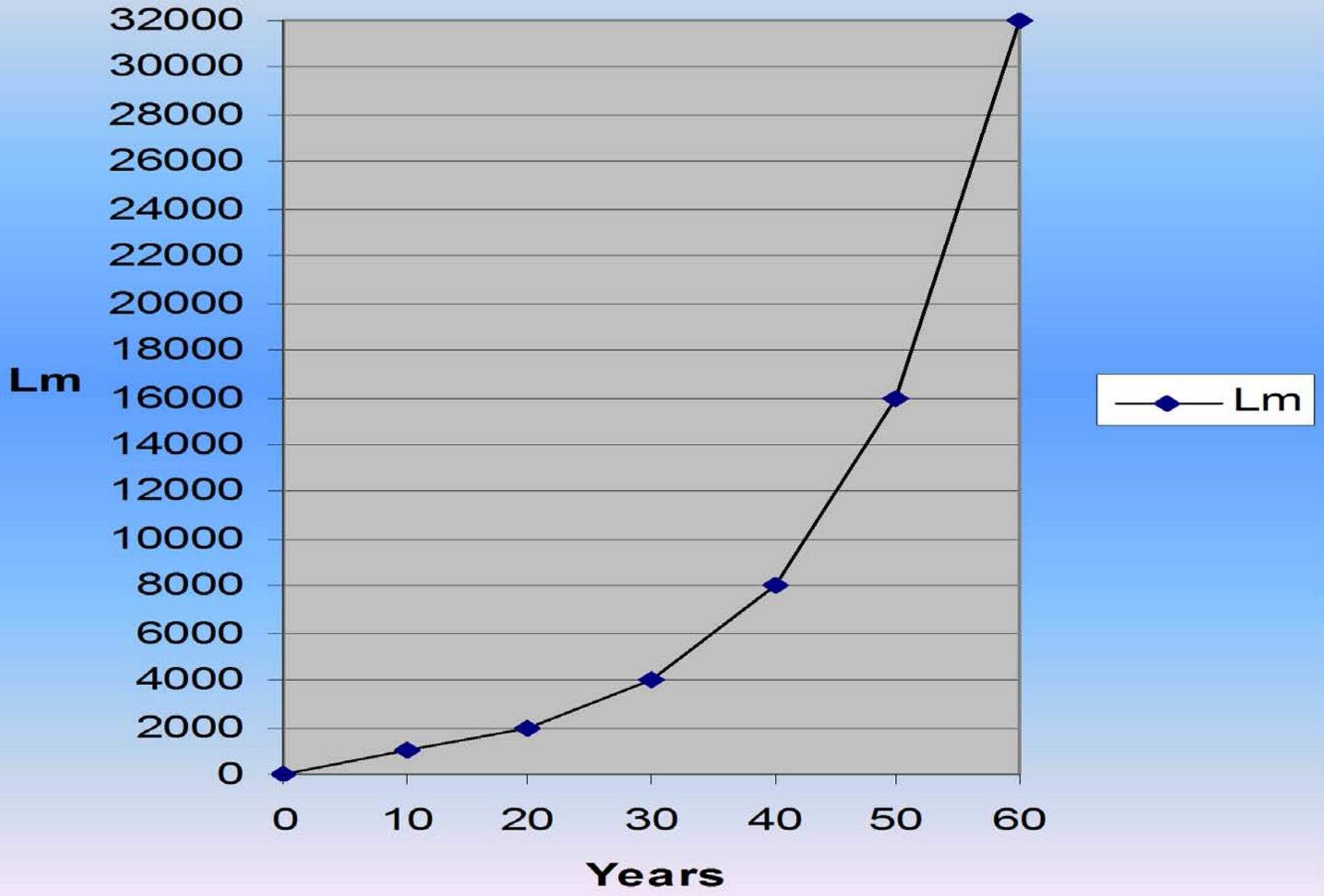
Linear Growth

(Lm 1000 every 10 years)



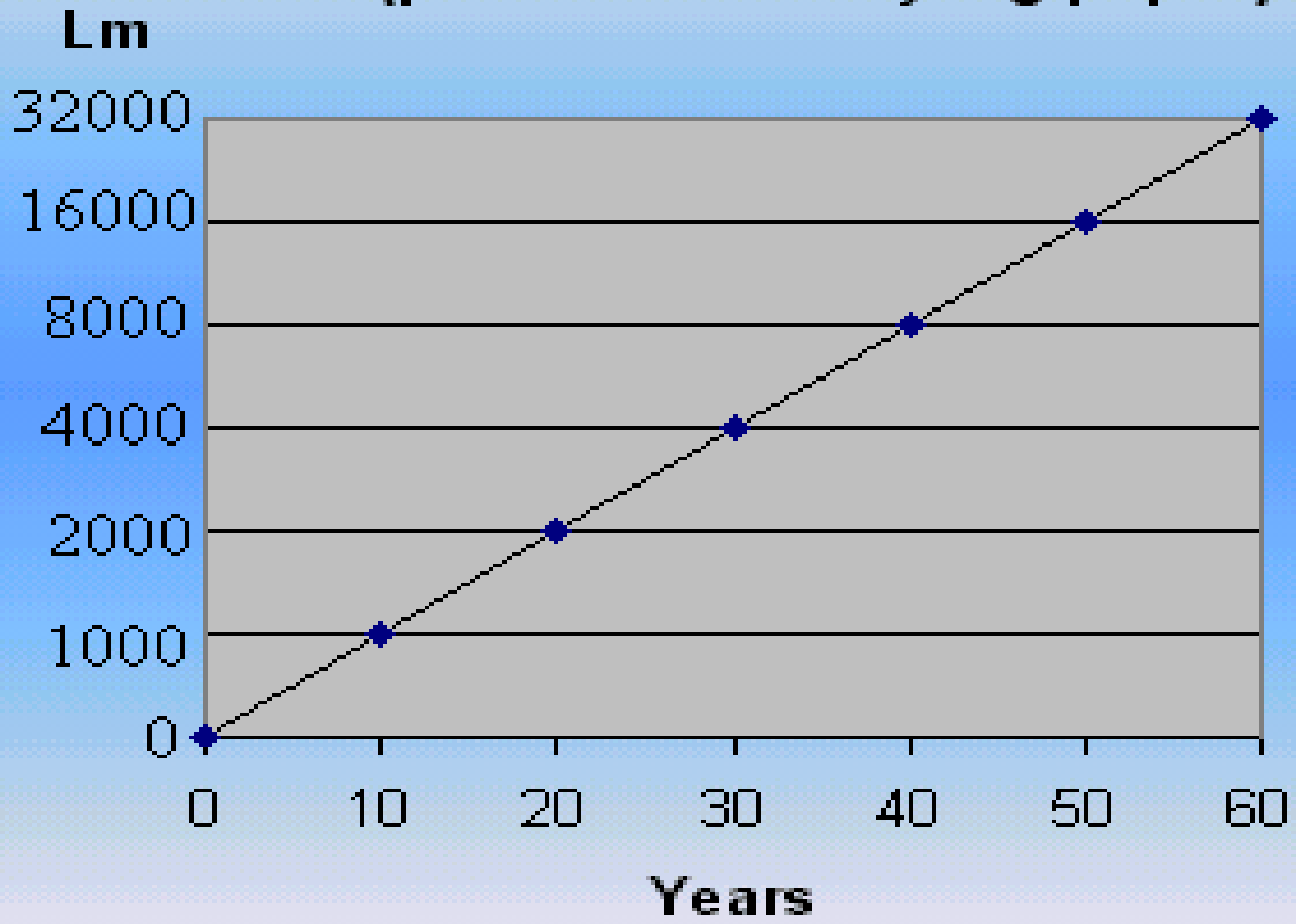
Exponential Growth

(doubling of value every 10 years)



Exponential Growth

(plotted on 2-way log paper)



$y = Ab^x$

y = Lm
A = constant
b = growth rate
x = years

A QUICK RULE

The % growth rate for a value to double over a number of years is given by:

% growth = 72/No of years

Ex 1. – for an asset to double in value over a period of 10 years require an annual growth rate given by 72/10 years = 7.2 % p.a.

Ex. 2 – for an asset with a growth of 5%, it requires 72/5% = 14.4 years to double in value

GROWTH RATES OF MALTESE AFFORDABLE HOUSING

Year	1982	1987	1992	1997	2002
Lm/m^2	70	91	150	220	270

Excel logest for $y = ab^x$ gives a = 69.12 b =1.0743the b value indicates a 7.43% annual growth over the 20 year period

Excel growth calculates predicted growth values

Eg. @ year 25 – Lm414/m^2 @ year 30 – Lm593/m^2

Goto Scenario testing

FORECASTS

The assessment of future value will include:

- **An analysis of market trends in respect of overall income, expenditure, rates of void occupation, capitalization and discount rates,;**
- **An analysis of economic trends which entails a review of the evolution of demographic and socio-economic patterns, employment co-efficient, and future competition;**
- **A study of business cycles, and macro and micro-economic climatic indicators.**

All limiting factors, agreed basis of forecasts and the exclusion of liability to the client and third parties for unforeseeable events must be pre-agreed when accepting instructions and in subsequent reporting.

FORECASTING LEADING INDICATORS

1. Treasury Bill Rate
2. Gilt yield
3. Volume of retail sale
4. Narrow money supply

All limiting factors, agreed basis of forecasts and the exclusion of liability to the client and third parties for unforeseeable events must be pre-agreed when accepting instructions and in subsequent reporting.

MUTLTIPLE AGGRESSION ANALYSIS

- An MRA model is essentially an equation used to predict the value of property
- Simplistic additive model structure is limited because it does not allow for the incorporation of elements, such as location, housing size, garage, whilst a multiplicative model is more effective
- Market value = b_o X House size ^{bi} X b2 Garage X b_4 location

TRADITIONAL VS MODERN VALUATION MODELS

MODULE II

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FREEHOLD INVESTMENT VALUATIONS

The rack rented valuation:

Suppose a freehold property has a rental income of Lm13,000 p.a. with the property just experiencing a recent review and therefore rack-rented.

An appropriate investment yield rate for the property is 7%, as further open-market rent reviews will occur every 5 years

$$C = R/Y = R \times YP$$

Capital value ignoring transaction costs C = Lm13,000X 100/7

= Lm185,718

YP = 100/7 = 14.286 is a multiplier similar to applying a P/E ratio to the earnings of a quoted company to arrive at market price for investment.

THE ‘TERM & REVERSION’ VALUATION - (not widely used in the Institutional Market)

The current rental income is presently Lm10,000 p.a. with the next review to Lm13,000 p.a. in 2 years’ time.

Rent passing	Lm10,000		
YP for 2 years @ 6%		1.833	Lm 18,330
Estimated rental value	Lm13,000		
YP in perp @ 8%			
Deferred 2 years @ 8%		10.717	Lm139,321

Gross Capital Value			Lm157,651

The owner here loses out of Lm6,000 in rental income, however this valuation has devalued property by

Lm185,718 – Lm157,651 = Lm28,067

THE RATIONAL VALUATION MODEL

Opportunity cost of money (discount rate) = 15%			
Implied growth rate in rental value = 9% p.a.			
Rent passing	Lm10,000		
YP for 2 years @ 15%		1.626	Lm 16,260
Present rental value	Lm13,000		
Amount of Lm1 in 2 yrs @ 9%	1.188		

	Lm15,444		
YP in perp @ 7%			
Deferred 2 years @ 15%		10.802	Lm166,826

Gross Capital Value			Lm183,086

TRADITIONAL LEASEHOLD VALUATION

The same previous is now considered a leasehold interest with an unexpired term of 60 years

Rent passing		Lm10,000	
YP in perp @ 9% with SF			
For 60 yrs @ 4% & taxed at 40%		10.309	Lm103,090
Estimated rental value	Lm13,000		
Less rent passing	Lm10,000	Lm3,000 p.a.	
Reversionary increase			
YP in perp @ 9% SF			
For 58 yrs @ 4% taxed @ 40%			
& deferred 2 yrs @ 9%		8.62	Lm 25,800

			Lm128,950

THE LEASEHOLD 'RATIONAL VALUATION' MODEL

Adapts the same discount rate of 15% together with the implied rental growth of 9% for rent reviews every 5 years thus considering adequate a rack-rented capitalisation rate of 7%

Rent passing		Lm10,000 p.a.	
YP for 2 yrs @ 15%		1.626	Lm 16,260
Present rental value	Lm13,000 p.a.		
Amount of Lm1 in 2 years @ 9%	1.188	Lm15,444 p.a.	
YP in perp @ 7% deferred2 yrs @ 15%		10.802	
Gross Freehold Value			Lm183,086
Less			
Present rental value	Lm13,000		
Amount of Lm1 in 60 yrs @ 9%	176.031		
Rental value in 60 years' time		Lm2,288,403	
YP in perp @ 7% deferred 60 yrs @ 15%		0.003	Lm 6,865

GROSS CAPITAL VALUE			**Lm176,221**

CALCULATING A PROPERTY CAPITALISATION RATE

MODULE III

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All Risks Yield (Capitalization Rate)

SHOPS

Prime sites occupied by national retail Organisations……...4.5%

District centres……....6.5%

Small parades……8.0%

OFFICES

In financial centres……..…5.5%

Other main provincial……..…8.0%

FACTORIES

Single storey……8.0%

Multi-storey……....10.0%

Depressed area……15.0%

INVESTMENT YIELDS AND INFLATION 1950 - 2000

YEAR	ORDINARY SHARES	BANK RATE	RETAIL PRICE INFLATION	PRIME SHOPS	PRIME OFFICE	PRIME INDUSTRIAL
1950	5.5	2.0	2.4	5.5	6.5	N/A
1955	6.25	4.0	6.2	5.5	7.0	N/A
1960	5.0	6.0	1.8	5.5	7.0	10
1965	5.25	6.5	4.6	6.0	6.5	9.0
1970	5.0	7.5	7.9	7.5	7.5	9.0
1975	6.75	10.0	24.9	6.5	6.5	9.0
1980	6.45	15.0	15.1	4.5	5.5	7.5
1985	4.75	10.0	5.3	4.5	5.5	8.0
1990		12.0	4.0	4.5	5.5	7.5
1995		7.0	3.0	4.5	5.5	7.0
2000		6.5	2.4	4.5	5.5	7.0

RELATIONSHIP BETWEEN TOTAL RETURN & INITIAL RETURN

Fischer Equation e = p + i + r

e is the total return required from an investment

p is the reward for liquidity preference or consumer impatience

i is the expected inflation

r is the risk

The return given by medium term risk free Government Bonds (RFR) is given by (p+i)

The Fischer Equation is re-written as

e = RFR + r

Property risk is normally taken at 2% risk premium together with a 1% premium for tenant risk

Thus a present property discount rate is assumed at

5%(Govt Bond) + 2% + 1% = 8%

GORDON'S GROWTH MODEL

$$k = e - g$$

Where k = initial yield from an investment

e = total return required from an investment

g = annual expected growth

Which may be written as

$$k = RFR + r\text{-}g$$

In simple arithmetic, the return summed to infinity on an investment with a growing income stream may be approximated to the initial yield plus the growth rate at which it is compounding

DEPRECIATION

DEPRECIATION – " the loss in real existing use value of property"

OBSOLESCENCE ('functional' & 'obsolescence') a decline in utility not directly related to physical usage or passage of time curable or incurable

Buildings depreciate through physical deterioration and economic obsolescence. Buildings, unlike companies age and become less valuable as a passage of time

$$\text{thus} \quad RFR + r = k + g - d$$

$$\text{so} \quad k = RFR + r - g + d$$

Findings for London Offices (Baum) found the annual rate of depreciation ‘d’ in rental value over the first 35 years @ 1.1% p.a. The period of greatest depreciation was years 17 to 26 @ 1.8%.

The annual rate of depreciation in capital values averaged 1.6% p.a. The period of greatest depreciation was years 20 to 29 @ 2.1%. Similarly rental Industrials deteriorated at 0.65% p.a.

$R_n = R_o (l-d)^n$

R_n rental value of building n years old

R_o rental value of building 0 years old

d is rate of rental depreciation p.a.

n is number of years

DEPRECIATION – New hypotheses: Baum (2003)

- A relationship exists between repairing liabilities, lease lengths and depreciation rates
- Continental European Markets have shorter leases & pass on less repairing liability to occupiers.
- Thus London has a depreciation rate of 1.1% p.a

  Paris & Frankfurt of 0.74% p.a

  Amsterdam of 2.8% p.a. &

  Stockholm of 0.15% p.a.

IMPLIED RENTAL GROWTH EQUATIONS

$$y = d\left(\frac{(1+d)^n - (1+g)^n}{(1+d)^n - 1}\right)$$

where y = capitalisation rate (initial yield)

d = discount rate (opportunity cost of money)

g = the implied long-term rental value growth

n = the number of years to the next rent review

Alternatively $g = \left(\frac{(d-y)}{d}(1+d)^n + \frac{y}{d}\right)^{1/n} - 1$

EXAMPLE OF IMPLIED RENTAL GROWTH EQUATION

For a rack-rented capitalisation rate y = 5% and discount rate (opportunity cost of money) = 12%

For a 5-yearly period rental review

$$g = \left[\left(\frac{0.12 - 0.05}{0.12}\right) (1+0.12)^5 + \frac{0.05}{0.12} \right]^{1/5} - 1$$

g = 0.0764 or 7.64% p.a.

FURTHER TO GROWTH EQUATION

Assume a present risk free 10 year bond rate at 5.5%, increments for property investment at 2% & tenant risk at 1%.

A property discount rate taken at

5.5% + 2% + 1% = 8.5%

If a 10% rental increase assumed every 3 years, an all risks yield given at

$$Y = 0.85 \left[\frac{(1+0.085)^3 - (1+0.0333)^3}{(1 + 0.85)^3 - 1} \right]$$

AFY = 5.33%

FURTHER TO VALUATION TABLES

MODULE IV

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RENTAL PAYMENTS

Rent unlike other payments is frequently paid ½ yearly or quarterly in arrears. As payment is in arrears, the 1st payment of rent starts at period 0. Annual inputs, outputs and rates of interest will need to be adjusted

For an annual capitalization rate of 10%, for payments quarterly in arrears the rent is divided by 4, whilst the target rate is less than a quarter of the annual figure because of the effect of compounding

given by $(1+i)^{1/n} - 1$

$= (1 + 0.1)^{0.25} - 1 = 2.4114\%$

Examples of valuation tables

	Purchase Price	1250000				
	Rent	100000				
	Sale Price	1500000				
	NPV Rate	10%				
Year	Purchase Price	Rent	Sale Price	Net Cash Flow	PV factor	PV Cash flow
0	-1250000			-1250000	1.0000	-1250000
1		100000		100000	0.9091	90909
2		100000		100000	0.8264	82645
3		100000		100000	0.7513	75131
4		100000		100000	0.6830	68301
5		100000	1500000	1600000	0.6209	993474
						60461
	Net present value	60461				
	IRR	11.199%				

Discounted cash flow

EXAMPLES OF RENTAL PAYMENTS

Value a rental payment in arrears of Lm1,000 p.a. for 3 years @ 10%

YP for 3 years @ 10% = 2.48685 X Lm1,000 = Lm2,486.85

The same payment but in advance

YP for 1 payment is 1 year + YP's for 2 years is 1.736

YP in advance totals 2.736 X Lm1,000 = Lm2,736

- for perpetual investment payable in advance increase years purchase by 1.

FURTHER TO RENTAL PAYMENTS EXAMPLES

- Value a perpetual Lm1,000 rental investment paid quarterly in advance at 12% rate of return.
- Quarterly rate $(1+0.12)^{0.25} - 1 = 2.874\%$
- YP in advance = 100/2.874 + 1 = 35.795
- Valued at Lm1,000/4 X 35.795 = Lm8,950
- As opposed to Lm1,000 X 100/12 = Lm8,333

CONTINUOUS COMPOUDING

When interest is added more frequently than annually, the compound interest $(l+i)^n$ is adjusted to $(1 + i/m)^{mn}$ where m is the number of times p.a. that interest is added, i is the normal interest rate and n is the no of years.

Mathematically the max sum to which Lm1 could compound in 1 year at 100% p.a. works out at

$$1 + \frac{1}{1} + \frac{1}{1X2} + \frac{1}{1X2X3} + \frac{1}{1X2X3X4\ldots..} + \frac{1}{n!} = e\ (2.718282)$$

Thus Lm1 invested at i with interest compounded continuously over n years accumulates to e^{in}

EXAMPLE OF CONTINUOUS COMPOUNDING

To what sum will Lm1 compound over 2 years at 10% p.a. nominal rate of interest assuming continuous compounding

$$e^{in} = 2.718282^{(0.1)(2)}$$

$$= 2.718282^{0.2}$$

$$= \sqrt[5]{2.718282}$$

$$= Lm1.221$$

As opposed to annual compound rate of $(1.1)^2$ = Lm1.21

thus where interest compounds continuously

$$PV = e^{-in}$$

i.e. 0.819 as opposed for the normal PV of 0.826 for 2 years @ 10%

MONEY-WEIGHTED & TIME-WEIGHTED RATES OF RETURN

Money-weighted returns take no account of fluctuations in the capital (market) value of an investment between the date of commencement of the measurement period, and the final date of the cash flow. It is a measure of the return on the investment over the total period, acknowledging only the value at the beginning and value at the end of the period.

Time-weighted returns, on the other hand, take account of the capital value of the investment at each cash flow sub-period (say quarterly) and measure the individual returns for each sub-period on the basis of notional market values at the start and finish of each sub-period and actual cash flow during that time.

The distinction between time-weighting and money-weighting may be clarified when it is realised that an index (such as the F.T. Actuaries All Share Index) is a time-weighted measure.

EXAMPLE OF MWRR & TWRR

Period	Market Growth	Asset Value
Year 0	-	Lm100
Year 0 to 1	5%	Lm105
Year 1 to 2	10%	Lm115.50
Year 2 to 3	20%	Lm138.60
Year 3 to 4	2%	Lm141.37
Year 4 to 5	4%	Lm147.02

TWRR = $\sqrt[5]{(1.05 \text{ X } 1.1 \text{ X } 1.2 \text{ X } 1.02 \text{ X } 1.04)} - 1$

= 8.014%

For the above example as there are no intermediate cash flows, MWRR is calculated as follows

IRR = (-Lm100, 0, 0, 0, 0, Lm147.02) = 8.014%

To be noted that n a rising market MWRR>TWRR

whilst in a falling market MWRR<TWRR

FURTHER EXAMPLE OF MWRR & TWRR

Property Asset purchase price Lm100,000

net income Lm 10,000 p.a.

value end of year one Lm125,000

sale price end of year two Lm145,000

IRR(MWRR) = (-100,000, 10,000, 155,000) = 29.6% p.a.

To calculate TWRR

growth end of year 1 = (Lm125,000 + Lm10,000 – Lm100,000)/Lm100,000 = 0.35

Growth end of year 2 = (Lm145,000 + Lm10,000 – Lm125,000)/Lm125,000 = 0.24

TWRR = $\sqrt{1.35 \text{ X } 1.24} - 1 = 29.4\%$

SIMPLIFIED METHODS OF CALCULATION FOR MWRR & TWRR

$MWRR = (V_1 – V_o + \sum C)/V_o$

Where V_o = capital value at start of period

V_1 = capital value at end of period

$\sum c$ = rental income in period

MWRR = (Lm145,000 – Lm100,000 + Lm20,000)/100,000 = 65%

Over 2-year period as opposed to 1.296^2 = 1.68 i.e 68%

For continuous time MWRR = In (V_1+a) = In (165,000) = 0.5011

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V_o (100,000)

INTRODUCING THE MALLISON REPORT

MODULE V

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Price/value are market driven

Worth (part of groundbreaking Mallison report 1995) based on client's circumstances (value in use).

- **Price is the actual observable exchange price in the open market**
- **Value is an estimate of the price that would be achieved if the property were to be sold in the market**
- **Worth is a specific investor's perception of the capital sum which he would be prepared to pay (or accept) for the stream of benefits which he expects to be produced by the investment.**

- Worth is the underlyng investment value as opposed to valuation being an estimate of the most likely selling price termed the open market value. Individual worth is the maximum bid price of an individual purchaser who takes account of all available information in an efficient manner. Market worth is the price at which an investment would trade on a market where buyers and sellers were using all available information in an efficient manner.

VALUTION & CALCULATION OF WORTH

A rational investor will decide to purchase an asset if the price in the market is equal to or below his assessment of the present worth of future cash flows.

Conversely a decision to sell is triggered when the price in the market is equal to or greater than the owner's calculation of worth.

Methods should be developed for measuring & expressing valuation uncertainty.

RESIDUAL VALUATION & SENSITIVITY TESTING

MODULE VI

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GENERAL BASIS OF RESIDUAL VALUATION

SITE VALUE = Valuation on Completion – Cost of Work – Profit

Alternatively

PROFIT = Value on Completion – Site Cost – Cost of Work

RESIDUAL VALUATIONS

Value of Scheme		**p.a.**	
Income		658500	
Yield @ 7%	7%	14.2857	
			9407143
Costs of Scheme			
Land cost (incl. Acquisition costs)	1345000		
Builidng cost (incl. Acquistion costs)	4125000		
Professional fees	515500		
Contingencies	139000		
Short term finances @ 14% p.a.			
Land cost	521000		
bldg. Etc cost	493500		
letting delay on building costs	357000		
Agency fees			
letting and marketing	124000		
sale of investment	188000		
Total Development Cost			7808000
			1599143
Percentage of Value Cost	16.999241		
Percentage of Total cost	20.480826		

SIMPLE SENSITIVITY TESTING

Matrix of Site Values			
Estimated Rental Value of office space Lm per m^2	**Investment Capitalisation Rate**		
	6.75%	**7%**	**7.25%**
145	1.38m	1.18m	1.0 m
150	1.54m	1.35m	1.16m
155	1.72m	1.51m	1.31m

Developer's Profit Change with 10% change in Variable

	Return for risk and profit		Change in profit
Change in Variable ± 10%	Amt. £	% of CV	%
Rent	+ 2.51m	24.0	+57.0
	- 0.69m	8.0	-57.0
Yield	+ 0.76m	9.0	-52.5
	- 2.62m	25.0	+64.0
Bldg. Cost	+ 1.03m	11.0	-35.5
	- 2.16m	23.0	+35.5
Finance rate	+ 1.45m	15.5	-9.0
	- 1.74m	18.5	+9.0
Bldg period	+ 1.51m	16.0	-6.0
	- 1.69m	18.0	+6.0
Letting period	+ 1.55m	16.5	-3.0
	- 1.65m	17.5	+3.0
Pre-building period	+ 1.59m	17.0	-1.0
	- 1.61m	17.0	+1.0
Land Cost	+ 1.41m	15.0	-11.5
	- 1.78m	19.0	+11.5

PROFIT SENSITIVITY TO BREAK EVEN POINT

Variable	Change in variable to eliminate profit	New value of variable (approx)	Original value of variable
Rent	17.5%	£124 per m^2 (office rent)	£150 per m^2 (office rent)
Yield	21%	8.5%	7%
Building Costs	28.5%	£960 per m^2 (office cost)	£750 per m^2 (office cost)
Finance rate	105%	29%	14% p.a.
Building period	153%	3.75 yrs	1.5 yrs
Letting period	295%	2 yrs	0.5 yrs
Pre-building period	953%	5.25 years	0.5 yrs
Land cost	87%	£2.4m	£1.3m

COMBINED SCENARIOS

Variable	Optimistic scenario	Realistic scenario	Original estimate	Pessimistic scenario
Rental growth	7% p.a.	5% p.a.	-	3% p.a.
Investment yield	6.75%	7%	7%	7.25%
Building costs increase	6% p.a.	7.5% p.a.	-	9% p.a.
Finance rate	12% p.a.	14% p.a.	15% p.a.	16%
Building period	18 mths	18 mths	18 mths	18 mths
Letting period	No delay	6 mths	6 mths	9 mths
Prebuilding period	6 mths	6 mths	6 mths	9 mths
Contingencies	3%	3%	3%	3%
Land cost (incl acquistion cost)	£1.35m	£1.35m	£1.35m	£1.35m

DEVELOPER'S RETURN FROM COMBINED SCENARIO

	Optimistic scenario	**Realistic scenario**	**Original estimate**	**Pessimistic scenario**
Developer's return	£3.5m	£2m	£1.6m	£0.5m
% of CV	31.5%	19.2%	17%	5.8%
% of total costs	46.1%	23.8%	20.5%	6.2%
Increase over original estimate	120%	25%		-65%

This method suffers two main problems; firstly it is unlikely but not impossible, that the optimistic or pessimistic values for each variable would combine together to give the optimistic and pessimistic profit levels shown, and secondly no information is provided on the likelihood or probability of these estimates occurring.

MONTE CARLO METHOD

Variable	Range	Probability	Probability numbers (out of 100)
Rental growth	0%	15%	1 –15
(rate of annual	+3%	20%	16-35
Increase during	+5%	40%	36-75
Development)	+7%	20%	76-95
	+10%	5%	96-100
Investment yield	6.5%	5%	1-5
	6.75%	15%	6-20
	7%	50%	21-70
	7.25%	30%	71-90
	7.5%	10%	91-100
Construction cost	+5	10%	1-10
inflation per annum	+6	25%	11-35
	+7.5	40%	36-75
	+8.5	20%	76-95
	+10	5%	96-100

MONTE CARLO METHOD - continued

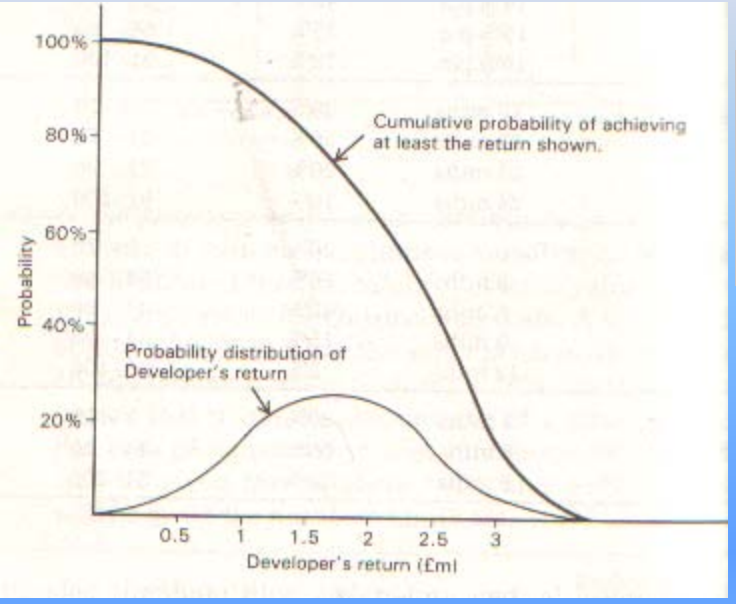
Finance Rate	12% p.a.	5%	1-5
	13% p.a.	25%	6 – 25
	14% p.a.	40%	26 – 65
	15%p.a.	25%	66 – 90
	16% p.a.	10%	91- 100
Building period	15 mths	20%	1 – 20
	18 mths	50%	21 – 70
	21 mths	20%	71 – 90
	24 mths	10%	91 - 100
Letting period	0	20%	1 – 20
	3 mths	20%	21 – 40
	6 mths	40%	41 – 80
	9 mths	15%	81 – 95
	12 mths	5%	96 – 100
Pre-building period	3 mths	20%	1 – 20
	6 mths	60%	21 – 80
	9 mths	20%	81 - 100

RANDOM NUMBERS

If one of the random runs gives these random numbers 22, 53, 14, 80, 42, 77 and 68 this scenario is calculated

Rental Growth	Investment Yield	Construction cost inflation	Finance rate	Building period	Letting period	Pre-building period
+ 3% p.a.	7%	+6% p.a.	14%	18mths	6 mths	6 mths

MONTE CARLO SIMULATION IN 1000 RUNS

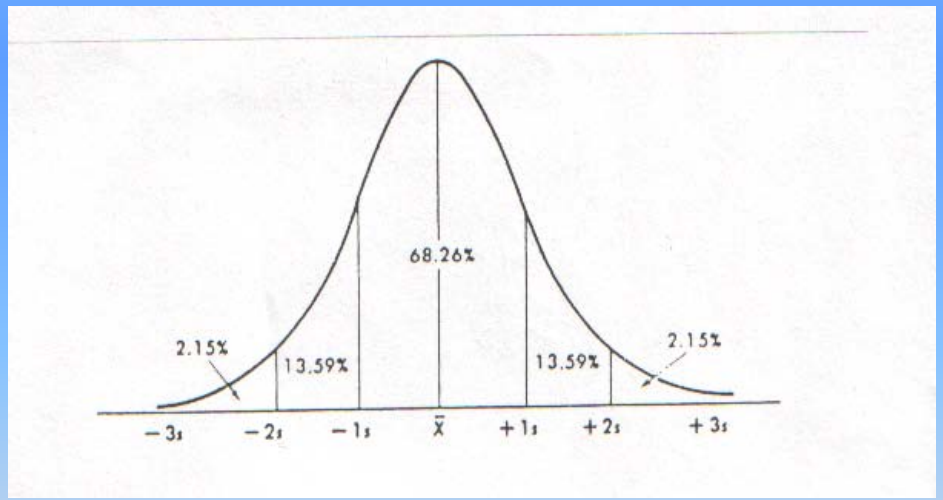


	Captial value (£)	Total costs (£)	Profit (£)	Return on CV%	Return on TC%	Change in profit %
1	9.4m	8.7m	0.7	7.8	8.4	-54
2	11.2m	8.2m	3m	26.8	36.6	87.2

Simulation No's 1 & 2

	Mean	Standard deviation
Caital value	£10.2m	£0.61m
Total cost	£8.3	£0.36m
Profit	£1.9m	£0.65m
Return on CV 18.8%		
Return on TC - 23.2%		
Change in profit from original appraisal = 20.3%		

Result of 1000 runs



The Normal Distribution

MONTE CARLO SIMULATION IN 1000 RUNS

(continued)

Assuming that profit in this simulation is normally distributed, a 95% prediction interval (± standard deviations) for a single result for profit is:

£0.6m, £3.2m

This means that the developer can be virtually certain that profit from this development scheme will not be less than £0.6m and not more than £3.2m

RISK & UNCERTAINTY IN PROPERTY INVESTMENT
- The probability of achieving less than expected

MODULE VII

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October 2004

KAMRA TAL-PERITI

-ACCREDITED VALUERS

CPD COURSE

INVESTMENT DECISIONS

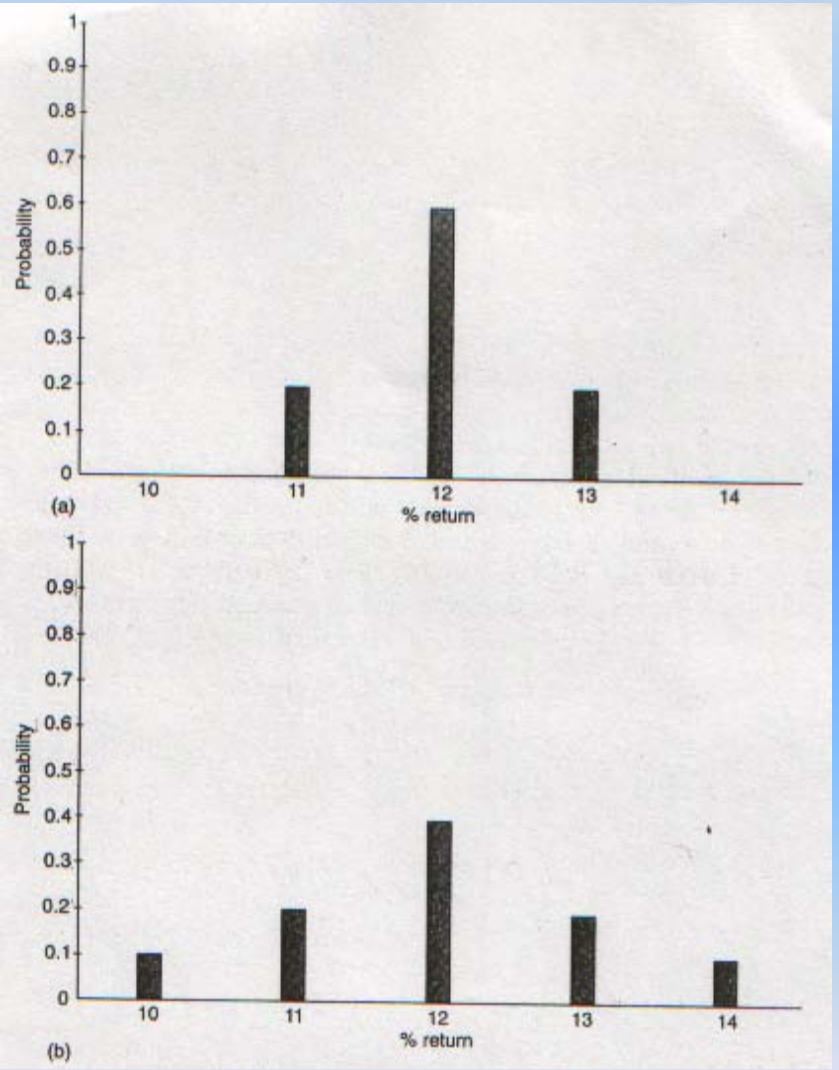
Probability distributions		
Return	Probability of return	
	Investment A	Investment B
10	0.0	0.1
11	0.2	0.2
12	0.6	0.4
13	0.2	0.2
14	0.0	0.1
	1.0	1.0

Expected returns for each investment

E(A) = 11(0.2) + 12(0.6) + 13(0.2) = 12%

E(B) = 10(0.1) + 11(0.2) + 12(0.4) + 13(0.2) + 14(0.1) = 12%

AMOUNT OF VARIABILITY, DISPERSION, SCATTER IN EACH DISTRIBUTION



(a) Investment A (b) Investment B

$VAR(A) = 0.2(11-12)^2 + 0.6(12-12)^2 + 0.2(13-12)^2 = 0.4$

$VAR(B) = 0.1(10-12)^2 + 0.2(11-12)^2 + 0.4(12-12)^2 + 0.2(13-12)^2 + 0.1(14-12)^2 = 1.2$

$SD(A) = \sqrt{0.4} = 0.63$

$SD(B) = \sqrt{1.2} = 1.09$

Coefficient of variation (CV) = SD of returns/means

$CV(A) = 0.63/0.12 = 5.25$

$CV(B) = 1.09/0.12 = 9.08$

Thus investment A is preferred to investment B

RISK AVERSION – UTILITY CHARACTERISTICS

Consider a project which if successful will give a gain of Lm200,000 but if it fails will give a loss of Lm100,000 with the probability of success given at 80%.

The expected monetary value (EMF)

= (0.8) Lm200,000 + (0.2)(-Lm100,000) = + Lm140,000

Although positive result prefers to doing nothing, developer considers whether he can shoulder at Lm100,000 loss

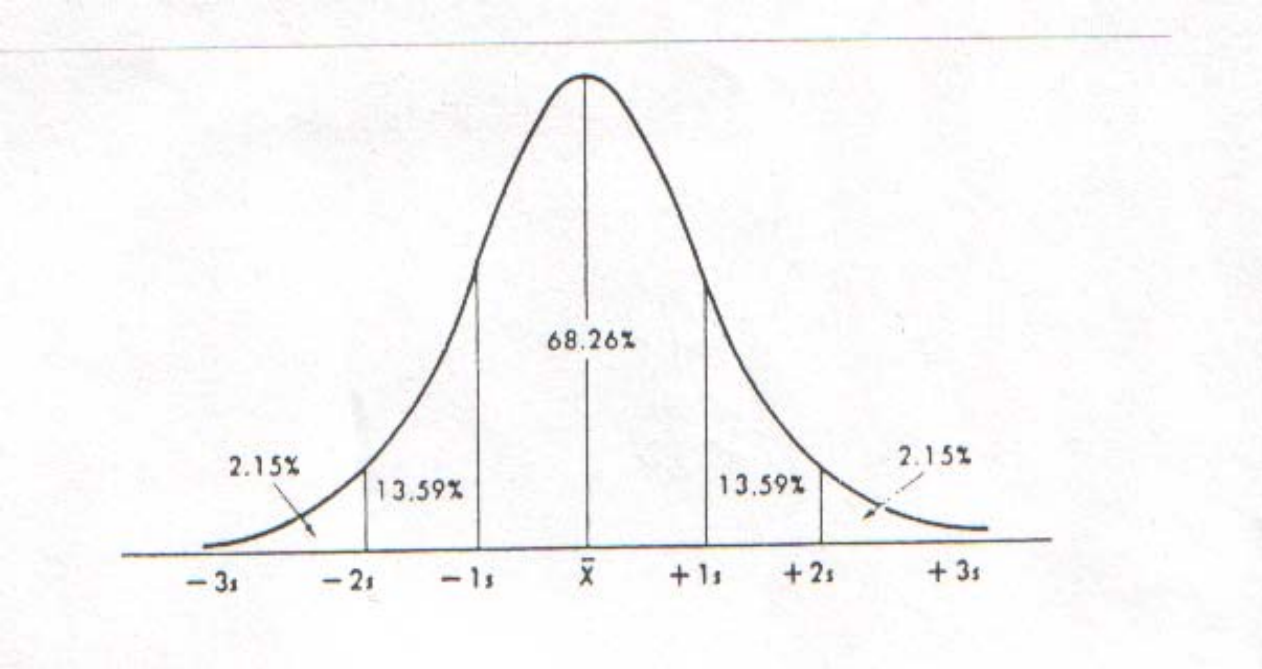


Fig 1 – The Normal Distribution

Risk & return can be characterised by the mean & standard duration as shown in Module VI.

If you have an investment with an expected return of 10%, with a standard deviation of 5%, you can say that for 68% or 2/3 of the time, your returns on this investment will lie between 5% & 15%.

HIGHEST, LOWEST AND MOST LIKELY VALUES

Presently a rental agreement of Lm15,000 p.a is to be updated in 5 years' time. Its most likely future value stands at Lm18,000 p.a. with its most optimistic value at Lm21,000 p.a. and the worst scenario to stand at Lm15,000 p.a.

For a normal distribution, the difference between the highest and lowest and the most likely values is 3SDs

SD= (Lm21,000 – Lm18,000)/3 = Lm1,000 p.a.

HIGHEST & LOWEST VALUE APPROACH (continued)

If the present capitalization rate is 6.5%, with the highest rate to be taken at 7% and lowest rate at 6% in 5 years' time

SD = (7%-6.5%)/3 = 0.167

$$\left(\frac{SD_c}{C}\right)^2 = \left(\frac{SD_R}{R}\right)^2 + \left(\frac{SD_R}{I}\right)^2 \text{ where } C = R/I$$

$$(SD_c) = \left\{\left(\frac{1000}{18{,}000}\right)^2 + \left(\frac{0.167}{6.5}\right)^2\right\}^{½} = 0.061C$$

or 6.1% of Capital Value is the Standard Deviation

FURTHER TO THE HIGHEST & LOWEST APPROACH

The most likely capital value

C= Lm18,000/6.5% = Lm276,923

However there is a

68% probability of value lying between Lm276,923 ±6.1%

95% probability of value lying between Lm276,923 ±12.1%

100% probability of value lying between Lm276,923 ±18.3%

The above gives a range of values Lm310,440 down to Lm243,423 @ 95% probability

(to be noted that if pessimistic rental amount of Lm15,000 p.a. X 100/7 = Lm214,285 however it is highly unlikely that the worst scenarios occur simultaneously)

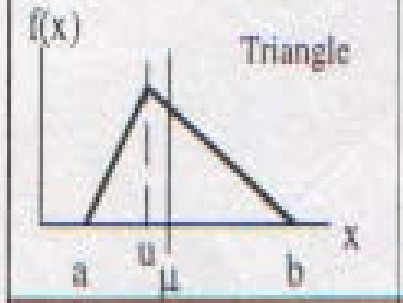
FURTHER DISTRIBUTIONS

The Standard Distribution tends to zero on either side of the curve and is symmetrical about the mean value.

In property Investments, the highest and lowest values would be finite value probably in a skewed distribution.

Better distributions having finite value are the Triangle Distribution & Beta Distribution with properties shown below.

DISTRIBUTION TYPES



$-\infty < a < b < +\infty$

$$\mu = \frac{1}{3}(a+b+u)$$

$$\sigma = \sqrt{\frac{1}{18}\left(a^2+b^2+u^2-ab-au-bu\right)}$$

$a \le x \le u$

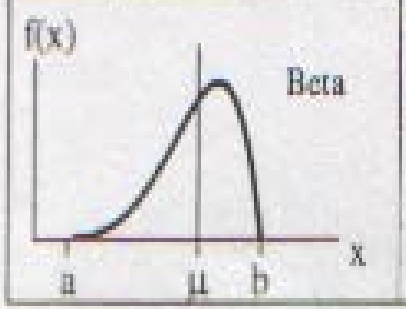
$$f(x) = \frac{2}{b-a}\left(\frac{x-a}{u-a}\right)$$

$$F(x) = \frac{x^2-2ax+a^2}{(b-a)(u-a)}$$

$u \le x \le b$

$$f(x) = \frac{2}{b-a}\left(\frac{b-x}{b-u}\right)$$

$$F(x) = 1 - \frac{x^2-2bx+b^2}{(b-a)(b-u)}$$



$-\infty < a < b < +\infty \qquad r,s \ge 1$

$$\mu = a + (b-a)\cdot\frac{r}{r+1}$$

$$\sigma = \frac{b-a}{r+s}\cdot\sqrt{\frac{r\cdot s}{r+s+1}}$$

$$f(x) = \frac{\Gamma(r+s)}{\Gamma(r)\cdot\Gamma(s)}\cdot\frac{(x-a)^{r-1}(b-x)^{s-1}}{(b-a)^{r+s-1}}$$

$$F(x) = \frac{\Gamma(r+s)}{\Gamma(r)\cdot\Gamma(s)}\int_a^u \frac{(u-a)^{r-1}(b-u)^{s-1}}{(b-a)^{r+s-1}}\,du$$

TRIANGULAR DISTRIBUTION FOR HIGHEST & LOWEST - (example)

v = Lm300,000; a = Lm245,000; b = Lm354,000

Mean value = 1/3 (245,000 + 354,000 + 300,000) = Lm300,000

SD = $[1/8 (245{,}000^2 + 354{,}000^2 + 300{,}000^2 - 245{,}000 \text{ X } 354{,}000 - 245{,}000 \text{ X } 300{,}000 - 354{,}000 \text{ X } 300{,}000)^{½}$

= Lm22,250

What is the probability that Capital Value is Lm325,000 or higher

$$F_{(x)} = 1 - \frac{(325{,}000 - 354{,}000)^2}{(354{,}000 - 245{,}000)(354{,}000 - 300{,}000)}$$

= 0.857 I.e. 14.3% chance of Lm325,000 or higher occurring

BETA DISTRIBUTION FOR HIGHEST & LOWEST - (example)

mean value $m = \frac{a+4v+b}{6} = \frac{245{,}000 + 4{,}300{,}000 + 354{,}000}{6}$

$= 299{,}833$

variance $v = \frac{(b-a)^2}{6} = \frac{(354{,}000 - 245{,}000)^2}{6} = 330{,}027{,}777$

$\alpha_1 = \left(\frac{m-a}{b-a}\right)^2 \left(1 - \frac{m-a}{b-a}\right) \left(\frac{v}{(b-a)^2}\right)^{-1} - \left(\frac{m-a}{b-a}\right) = 4.024$

$\alpha_2 = \left(\frac{m-a}{b-a}\right) \left(1 - \frac{m-a}{b-a}\right) \left(\frac{v}{(b-a)^2}\right)^{-1} - \left(1 - \left(\frac{m-a}{c-a}\right)\right) = 8.503$

PROPERTY IN A PORTFOLIO CONTEXT

MODULE VIII

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-ACCREDITED VALUERS

CPD COURSE

WHAT ARE THE IMPLICATIONS OF PROPERTY?

The Case for Property: Property is negatively related to equity & gilts. Therefore, including property will enhance portfolio returns & reduce risk.

Property offers more opportunities for active management than equity & gilts. The only way to improve performance on the latter 2 investments is to sell & purchase something else. With property you can restructure the lease, marriage value, refurbishment & finally re-development.

MEASURING RISK QUANTITATIVELY

(a) The standard deviation of series for return from property investment which shows the variability around the “average” return

(b) The correlations coefficient by which movements in returns of property are related to movements in returns of other assets, to show its risk reduction qualities in a mixed asset portfolio.

(c) The Beta coefficient of property i.e the slope of the regression line when returns from property are regressed against market returns, to show its relative sensitivity to market movements

CORRELATION BETWEEN ASSET CLASSES 1987-1995

	Property Direct	Property Companies	Gilts	Shares
Property Direct	**1.0**	**-0.01**	**-0.38**	**-0.09**
Property Companies		**1.00**	**N/A**	**0.80**
Gilts			**1.0**	**0.78**
Shares				**1.00**

Note: The correlation coefficient varies between 0 (not strong) and 1 (strong) and may be positively or negatively (- in table) correlated

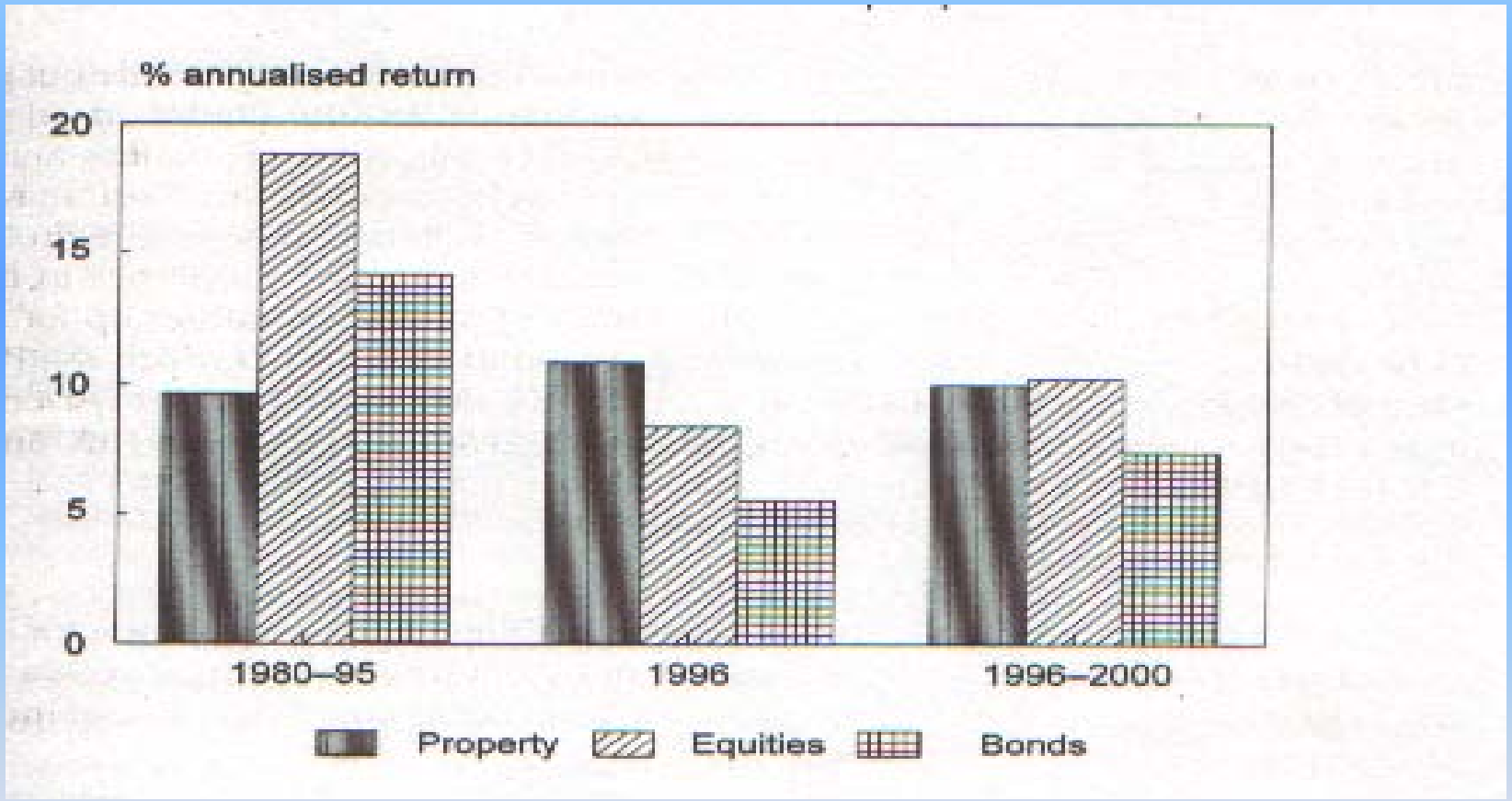
Source: RICS (1997)

However, property companies exhibit high correlation with the stock market and low correlation with the direct property market, capturing only a small portion of direct property market returns.

AVERAGE RETURNS & RISK FOR PROPERTY 1987 – 1995

SECTOR	AVERAGE RETURN %	STANDARD DEVIATION %
Direct Property Total	10	3.64
Offices	8.7	4.56
Retail	9.4	3.13
Industrial	14.2	4.17
Property Companies	13.3	23.57
Equities	15.7	18.71

COMPERATIVE PERFORMANCE OF INVESTMENTS

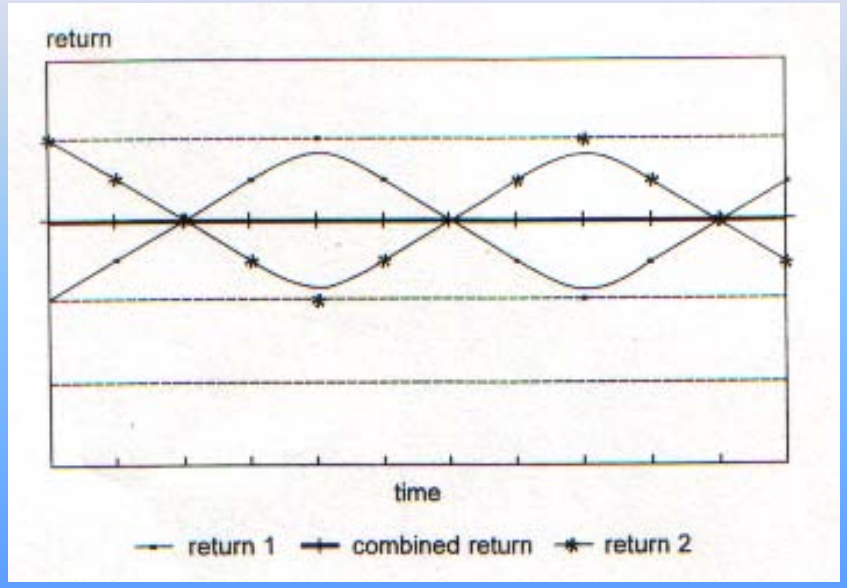


FURTHER TO DIRECT & INDIRECT PROPERTY

On the other hand yearly valuation-based series for direct property as opposed to the indirect property markets subjected to continuous transaction-based property information, tends to indicate that the publicly-traded indirect property vehicles are more likely to reflect changes in property market fundamentals.

Studies have shown this time-lag could be up to one year with property companies leading direct property.

Perfect negative correlation of investment returns



Diversification in a two-asset portfolio:

Expected return:

Investment	Return			Average return	Standard deviation
	Optimistic	Average	Pessimistic		
A	12	10	8	10	1.63
B	20	10	0	10	8.16
C	0	10	20	10	8.16

Assume a two-asset portfolio with three investments to choose from. Investment A is a low-risk investment, B & C are both volatile. 50% of funds will be invested in each investment.

Combined portfolio:

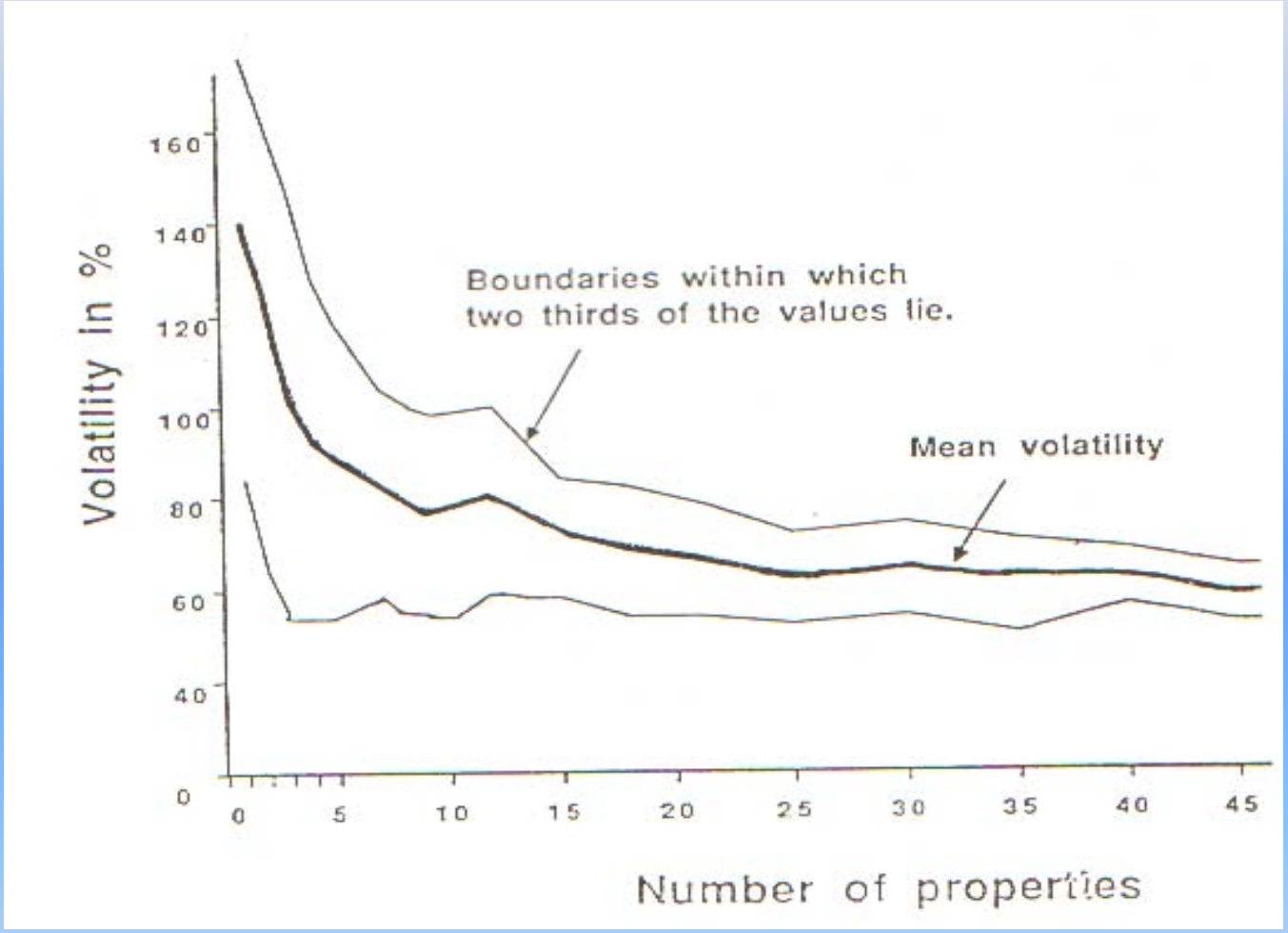
Investment	Return			Average return	Standard deviation
	Optimistic	Average	Pessimistic		
$(A+B)/2$	16	10	4	10	4.89
$(A+C)/2$	6	10	14	10	3.26
$(B+C)/2$	10	10	10	10	0

Expected Return on a Security = Risk-free Rate + beta (expected return on market portfolio – Risk –free rate)

Sector	Beta
Office	0.943
Retail	1.041
Industrial	0.850

If an investment has a Beta of 2 and the market rises 10%, this Investment will rise 20% +/- the Alpha value.

PORTFOLIO CONSTRUCTION - I



This shows that the number of properties necessary to remove the majority of specific risk is in the order of 30 to 45 equally sized investments. In the equities market note that 10 to 20 randomly selected shares would diversify away 90% of the non-market risk.

CORRELATION MATRIX BETWEEN SECTOR

	Industrial	Offices
OFFICES	0.9	0.82
RETAIL	0.82	

PORTFOLIO CONSTRUCTION II

DIVERSIFICATION ACROSS SECTORS - This could vary from

UK	35% offices	50% retail	15% Industrial	
UK	40% offices	40% retail	20% Industrial	
USA	30% offices	25% retail	10% Industrial	35% apartments

COMPUTER SPREADSHEET TECHNIQUES

Computer software known as an Optimiser can calculate how much of each asset should be held in order to achieve an efficiently diversified portfolio.

Inputs required are expected return on each asset, the uncertainly of this return (SD) and the extent of co-variance of pair of assets measured by correlation coefficient.

PERCEPTIONS OF PROPERTY RISK

1. The most important reasons for including property in a portfolio were the long term return and the low level term risk. The next most important reason was the need to diversity the portfolio.
2. 85% said that they considered the lack of short term volatility of property an advantage.
3. The most important disadvantage of property was illiquidity. Only 19% were neutral to this feature.
4. High units costs were a severe problem to 22% and minor problem to 44% but for large investors this was perceived to be a key advantage.
5. 40% were neutral to management costs. They were seen as recoverable and active management was viewed as an opportunity for increasing return not a burden.
6. The specialist knowledge needed to investing in property was seen as a further disadvantage.

MARKET EFFICIENCY

Access to property market information is more restricted thus leading to more inefficiency.

There is thus a greater likelihood of dealers earning abnormal returns.

Efficiency of the market is difficult to test with valuation models based on the comparison method, as no indication is given whether property is under or over-priced.

VALUERS TO SHIFT FROM THE TECHNICAL TO THE STATEGIC ROLE

The use of ‘appraisal’ rather than ‘transaction’ date in portfolio analysis taking into account the risk involved leads onto ‘Market Worth’ which is the price at which an investment trades where buyers and sellers use, in an efficient manner, all available information.

TYPES OF INVESTORS

- **Risk Averse –** actions involving high risk or large monetary loss are avoided.
- **Risk Neutral –** typical of owners of enormous wealth.
- **Risk taker –** takes the possibility of achieving the maximum reward from even the most dangerous gamble.

EPILOGUE

- Clients are return orientated
- Client is not happy to hover around the bottom of the performance table because he has a commensurately low level of risk.
- Competition will not be removed from the market – therefore RETURN will always be KING.

DIFFERING BASES OF MARKET VALUE

-Use of Recognised bases of Valuation as statutory requirements in respect of financial statements

MODULE IX

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-ACCREDITED VALUERS

CPD COURSE

Different definition of market derived and non market-derived bases of valuation – Chapter 5

I. Market Value
II. Mortgage Lending Value
III. Fair Value – Market Value for Existing Us
IV. Value in Use
V. Alternative Use Value
VI. Negative Values
VII. Depreciated Replacement Cost
VIII. Social Cost Benefit Analysis
IX. Retrospective Valuation

MARKET VALUE

Market value shall mean the price at which land and buildings could be sold under private contract between a willing seller and arm's-length buyer on the date of valuation, it being assumed that the property is publicly exposed to the market, that market conditions permit orderly disposal and that a normal period having regard to the nature of the property, is available for the negotiation of the sale.

MORTGAGE LENDING VLAUE

This means the value of the property by making a prudent assessment of the future marketability by taking into account long term sustainable aspects of the property, the normal and local market conditions, the current use and alternative appropriate uses. Speculative elements may not be taken into account. Mortgage lending value is thus close to Market value, but introduces a smoothing of market trends, rents and yields.

FORCED SALE & LIQUIDATION VALUE

The forced sale value is identical to Market Value, with the exception that the time allowed for marketing is unduly short, and publicity and market exposure is inadequate. The seller may also be under duress or compulsion.

FAIR VALUE

Synonymous to Existing Use of an Asset should be adopted in relation to valuations to market of fixed assets for the purpose of financial statements. For most purposes regarded as synonymous with the Market Value

IAS 16.6 defines it as

“the amount for which an asset could be exchanged between knowledgeable, willing parties in an arm’s length transaction.”

Article 30 of IAS 16 (Revised 1998) deals with revaluations of assets and states as follows:

“The fair value of land and buildings is usually its Market value. This value is determined by appraisal normally undertaken by qualified value.”

FAIR VALUE is also professionally used to provide a legal definition for attributing an equitable settlement between the parties to an action which is before the courts or is in contemplation of proceedings.

VALUE IN USE (THE CONCEPT OF WORTH) – INVESTMENT VALUE

In real estate valuation reporting, it is good practice, in order to avoid misleading the recipient, to use the word "value" only when expressing an objectively established value in exchange at a given date, to use the word "worth" only in the context of value in use.

Value in use is the amount obtainable from the use of an asset until the end of its useful life and from its subsequent disposal. Value in use is calculated as the present value of estimated future cash flows. The discount rate should be a pre-tax rate that reflects current market assessments to the time value of money and the risks specific to the asset.

Refer to IAS 16, 25 and 36

ALTERNATIVE USE VALUE

Often required in the case of valuation and appraisal for security purposes or as part of a highest best use analysis.

Alternative Use Values, which cannot be realized except on liquidation, closure or removal of the business to other premises, are not suitable for inclusion in the accounts except where an intention is adduced, on the part of the directors, to dispose of the asset, when it may form part of the assessment of Market Value, and be separately classified in valuation certificate.

Where Alternative use Value differs materially from existing use value it must be reported to the client by the valuer.

TRADE RELATED VALUATIONS – Chapter 8

Leisure Properties (regarded as a high risk area)

Theme/Country parks

Golf Courses

Hotel & bars/restaurants

Theatres, cinemas, bingo hall & casinos

Swimming and leisure Pools

CAPITAL VALUATION OF LEISURE PROPERTIES

- Profits or Accounts method – most common leading onto income capitalisation approach with earnings multiplier (Years' purchase) taken at between 5 & 8
- Discounted Cash flow method (DCF) grown in importance discounted at 14.5% for an established business & @ 16% for a new business
- Sales comparison approach – value/bed for hotel or value/table cover for restaurant

GOODWILL

For goodwill to exist there is to be “custom & business!” as per following zoological classification

1. The cat – who stays faithful to the location not person
2. The dog – who stays faithful to the person not the location
3. The rat – who is casual and is attracted to neither person nor location
4. The rabbit – who comes because it is close by and for no other reason

EXCLUSION FOR GOOWILL

Personal goodwill to be excluded – thus analogy of dog not to be considered.

The market value of a fully equipped operational entity operated by an **average competent operator** in annual parlance derives for the behaviour of the cat, rabbit and topped up by the rat.

Rule of thumb for calculating goodwill is to be given a multiplier in the range of 1-1.75 to the adjusted net profit

NEGATIVE VALUES

Negative values arise where real estate assets are subject to physical, legal, financial or contractual obligations which are attached to the legal interest and which generate a negative real or hypothetical cash flow or which require substantial remedial works. The assets convert into a liability, or negative value.

If positive values are shown in accounts, then logic and principles of transparency require that negative values must also be reported. To report the value of a legal interest, which is actually a liability at a 'nil' valuation will fail to present a true and fair view of the company's overall position.

If a negative value is reported, the directors' attention must be drawn to the matter in notes to the valuation certificate.

DEPRECIATED REPLACEMENT COSTS

(using replacement or rebuilding cost suitably adjusted)

- **Fire stations, power stations, chemical works fall into this category**
- **Depreciated Replacement Cost (DRC) is a valuation procedure which is employed to arrive at existing use value, or value in use, of specialized properties which are rarely if ever sold or let in the market other than as a part of a business. This is not considered to be a market-derived method, except for the land element of the valuation.**
- **In the absence of any market data, DRC is often adopted as a substitute for market generated analysis. It is, therefore, unsuitable for use in respect of properties that are held for the purpose of investment, or are surplus to the operational requirements of the company that owns them.**

DRC of a purpose-built high security cash centre

1	**Cost of construction replacement or modern substitute**	**Lm20,430,438**
2	**Effective capital value – allowance for deductions for age,obsolescence et all @ 11%**	**Lm18,099,355**
3	**Land Value – limited to existing use Lm400,000 per acre less 11%**	**Lm 5,598,100**
		Lm23,697,455
4	**Decapitalization rate @ 3.5%**	**Lm 829,411p.a.**
5	**General considerations disabilities not considered previously @ 7.5%**	**Lm 62,206 p.a.**
		Lm 767,205 p.a.
6	**Negotiations – reflecting the relative bargaining strengths of the parties**	**Lm 750,000 p.a.**

DECAPITALIZATION RATES

The rate of interest to be applied as the criterion of rental value, is not what a contractor would risk, but what he would get after negotiation in the market.

The decapitalization rate is taken as the ‘real’ rate of interest plus a borrower’s premium.

‘Real’ rate = min. lending rate – inflation rate

These rates have varied from

4% - 3.5% for educational or healthcare properties

7% - 5.5% for profit making activity

SOCIAL COST BENEFIT ANALYSIS

Previous research into public sector leisure properties revealed that extant valuation methods (e.g. DRC and trading-related valuations for capital accounting purposes produced unhelpful figures where those assets were owned and operated primarily for social purposes (i.e. value to the community) as oppressed to investment (i.e. value to the owner)

This leads to a search for a social value methodology into the realms of social Cost Benefit Analysis (SCBA). This essentially measures direct and indirect gains and losses to the impacted individuals and aggregates them as an expression of net economic value.

RETROSPECTIVE VALUATIONS

Retrospective valuations are required for a number of purposes including property tax, capital gains and wealth taxation, inheritance tax, and in connection with negligence and compensation. They may also be required for the purpose of reviewing existing valuations.

Whilst all this evidence may be relevant, it is important not to give too much weight to data that would not have been available to a valuer at the date of valuation, except, possibly to confirm or reject trends that would have been apparent at the time of the valuation.

Particular attention needs to be paid to valuations that require a review of other valuers' reports or could involve possible negligence claims. Available market reports, data bases, and valuation reports prepared at the time provide useful indicators of real market sentiment. This emphasizes the importance of keeping proper market and business records.

MALTA BASED PROPERTY DATABASIS

MODULE X

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-ACCREDITED VALUERS

CPD COURSE

Residential Property Data of the Maltese Islands

- Affordable housing capital growth (1982- 2002) – 7.43% pa
- Upmarket housing capital growth (1982- 2002) - 8.35% pa
- Affordable housing plots growth (1982- 2002) – 16.4% pa
- Building Cost increases (1982- 2002) - 1.25% pa
- GDP per capita growth (1982- 2002) - 5.8% pa
- Median wage growth (1982- 2002) - 4.4% pa
- Retail price index growth (1982- 2002) - 2.5% pa

Housing Affordability Index for the Maltese Islands - HAI

YEAR	MORTGAGE MONTHLY PAYMENT		MEDIAN FAMILY INCOME**	QUALIFYING MONTHLY INCOME		RATIO OF QUALIFYING FAMILY INCOME		HAI	
	3-bed	2-bed/r		3-bed	2-bed/r	3-bed	2-bed/r	3bed	2bed
1982	Lm60	Lm42	Lm184	Lm240	Lm168	1.3	0.91	77	110
1987	Lm69	Lm49	Lm242	Lm276	Lm196	1.14	0.81	88	123
1992	Lm108	Lm72	Lm320	Lm432	Lm288	1.35	0.90	74	111
1997	Lm165	Lm106	Lm427	Lm660	Lm424	1.55	0.99	65	92
2002	Lm169	Lm113	Lm522	Lm676	Lm454	1.29	0.86	77	116

****the median family income is factored at 1 for 1982, and by 1.35 for 2002 to account for the effect of the 2nd wage earner.**

The HAI (2004) is given at 85/125

The annual residential property permits granted to foreigners

Year	Permits	Average Value	Price/ sqm	Median Price/sqm
1982	175	Lm12055	Lm89	Lm70
1987	351	Lm10368	Lm77	Lm91
1992	315	Lm19860	Lm147	Lm150
1997	163	Lm34667	Lm257	Lm220
2002	465	Lm70389	Lm502	Lm270

Comparing Maltese Commercial Rentals with the European Average.

Property Type	Rental range of the Maltese Islands Lm/m^2	European Average Lm/m^2
Industrial	Up to Lm25	Lm37.50
Offices	Lm25 – Lm100	Lm230
Retail – shopping malls*	Lm30- Lm175	Lm1250

* High Str shops in Valletta command a value of Lm550/m^2