THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

FINM3406
Real Estate Finance

Lecture 13
Course Review

Lecturer: Paul Walker - p.walker@business.uq.edu.au
Course Coordinator: Dr Ihtisham Malik - i.malik@business.uq.edu.au

End of Semester Exam

- **Duration and Weighting**
  - 90 minutes plus 10 minutes reading time
  - 40% of course marks
- **Format – On campus in person**
  - Closed book – no electronic aids permitted (eg laptops, phones)
  - Calculators - Casio FX82 series or UQ approved (labelled) - **ESSENTIAL**
  - PART A – 10 multiple choice (all weeks)
  - PART B – 5 Short Answer/Essay type questions (weeks 5 – 12)
  - Content from Guest Lecture not examinable
- **Practice**
  - Refer to the tutorial activities

Real Estate as an Asset Class

- Real Estate - Bundle of Rights Theory
  - Ownership (private right enforceable against strangers)
  - Possession (possession is 9/10 of the law)
  - Control (what is built and what takes place)
  - Enjoyment (can use as see fit)
  - Exclusion (no trespassing)
  - Disposal (sale, lease or by will) & Destruction
- These rights are not unconstrained
  - Government controls (ie Planning, Environment, Heritage and Property Laws, Compulsory Acquisition)
  - Common law (ie nuisance)
  - Self imposed (Contracts – restrictive covenants, leases, mortgages, liens, caveats)

Real Estate as an Asset Class

- Conceptual frameworks for property ownership
  - Socialist
  - Communist
  - Capitalist
  - Liberal democratic ideology
- Purpose of built form – historic, current and future and how this impacts investment decisions
  - Enclosure/delimitation of space
  - Climate barrier/modifier
  - Protection and privacy

Real Estate as an Asset Class

- Real estate market characteristics
- **Heterogeneous Products**
  - Real Property is unique
- **Immobile Products**
  - Real estate exists in a defined spatial context
  - Buildings can be relocated but land is immovable
- **Localised Market**
  - Markets differ from region to region
- **Segmented Market**
  - Segmentation can be based on use, size/scale and location
- **Private negotiations with high transaction costs**
  - Time consuming, costly and complex

Real Estate as an Asset Class

- Comparison with other asset classes - Why are decisions about property generally more complex and time consuming compared to decisions about other asset classes?
  - Size – large capital requirements
  - Regulatory environment – high degree of regulatory control and compliance
  - Uniqueness
  - Time line – long time from inception to use/monetisation
  - Property is a wasting asset – depreciation and obsolescence
  - Limited liquidity
  - Quality of management impacts value

Real Estate Ownership Structures

- **Doctrine of Tenure** (spatial)

  All land is held by way of grant from the Crown (or in modern language from the State)
- **Doctrine of Estates** (temporal)

  All land tenure gives the owner the right of possession for specific duration (an estate can be a future interest – ie vested vs contingent)
  - Freehold – uncertain duration
    - Fee simple (akin to absolute ownership)
    - Fee tail (historical – inheritance limited to certain descendants)
    - Life Estate (granted for duration of a person's life – remainder/reversion)
  - Leasehold – certain duration
- **Doctrine of Waste**

  Owners of limited estates (ie less than fee-simple) are limited in their use of the land (ie cant do things to degrade its value) to protect future interests

Asset Returns

- **Capital Return**
  - The change in capital value of an investment over a holding period as a percentage between any change in capital value and the purchase price or value at the beginning of the measurement period.

$$\boldsymbol{Capital\ Return} = \frac{\boldsymbol{CV_1 - CV_0}}{\boldsymbol{CV_0}} * \boldsymbol{100}$$

Where:

CV_0 = capital value at the beginning of the measurement period

CV_1 = capital value at end of the measurement period

Asset Returns

- **Income Return**
  - Net income over the measurement period divided by the purchase price or capital value at the beginning of the measurement period.

$$\boldsymbol{Income\ Return} = \frac{\boldsymbol{NI}}{\boldsymbol{CV_0}} * \boldsymbol{100}$$

Where:

CV_0 = capital value at the commencement of the measurement period

NI = net income received during the period

Asset Returns

- **Total Return**
  - Percentage relationship between any capital gain or loss and income over the capital value at the beginning of the measurement period.
  - True return to the investor on their money.

$$\boldsymbol{Total\ Return} = \frac{\boldsymbol{CV_1 - CV_0 + NI}}{\boldsymbol{CV_0}} * \boldsymbol{100}$$

Where:

CV_0 = capital value at the commencement of the measurement period

CV_1 = capital value at end of the measurement period

NI = net income received during the period

Portfolio Returns

- **Portfolio return:**
  - Return is a weighted average of expected return on each asset.
  - Consider two assets with weights, $w_1 w_2$ and returns $r_1 r_2$.

Portfolio return:

$$r_p = (w_1 r_1) + (w_2 r_2)$$

Example:

In a $100m portfolio you have one asset worth $70m returning 10.4% and one asset worth $30m returning 2.7%

$$r_p = (0.7 \text{ x } 10.4) + (0.3 \text{ x } 2.7)$$
$$= (7.28) + (0.81) = 8.09\%$$

Real Estate Appraisal (Valuation)

What is a valuation and the role of a valuer?

Methods of Valuation:

- Direct Comparison
- Summation
- Before and After
- Hypothetical Development (more detail in week 5)
- Discounted Cash Flow (more detail in week 6)
- Units of Production
- Capitalisation method

Capitalisation method

- This valuation method is used for investment class properties
- This method has been widely accepted as being suitable for the estimation of Market Value.
- Under this method, the Future Sustainable Annual Net Income of the subject property is converted to a capital sum (or value) by a market derived multiplier.
- There is a basic assumption that the level of income will remain constant in perpetuity, or at least sufficiently long term to adopt a calculation of the income stream in perpetuity.

Capitalisation Rate

- Cap rate often referred to as yield or “All Risks Rate”
- It is a rate that represents all current and future expectations and benefits to be derived from a property.
- The rate can be used as a benchmark for the comparison of investments
- Benefits - very simple to use and easy to compare with other assets
- Challenges – integrity and availability of market data to derive rate

Capitalisation Rate

- The formula used for the Capitalisation Method is:

$$CV = \frac{NI}{i}$$

- Where:
  CV = Capital Value
  NI = Net Annual Sustainable Income (also sometimes called Net Operating Income)
  i = Capitalisation Rate (or Yield)

- The valuer needs to establish:
  - The Open Market Rental Rate applicable to the property by reference to market rental evidence.
  - The Cap Rate by analysis of recent sales evidence.

- The factor is generally applied to the analysis/valuation of income streams (annuities) from real property held freehold in fee simple which are considered to be enjoyed in perpetuity.

The Valuation of Varying Incomes

- There are several methods available for the valuation of varying incomes:

1 – Term and Reversion;

- This method capitalises and then aggregates the term and reversionary Incomes. The reversionary value will need to be converted to a present value.

2 – Hard Core Method;

- Under this method, income flows are dealt with as horizontal slices, with passing rent being the "core" income, and future increases due to reviews or reversions being additional slices.

3 – Shortfall Method.

- This method calculates the "loss" of income before market rates are achieved and deducts the value so derived from full market value.

Nature of Development Process

Creative

- Often intuitive
- Especially up-front
- Assimilate multiple inputs
- Importance of networks

Rational

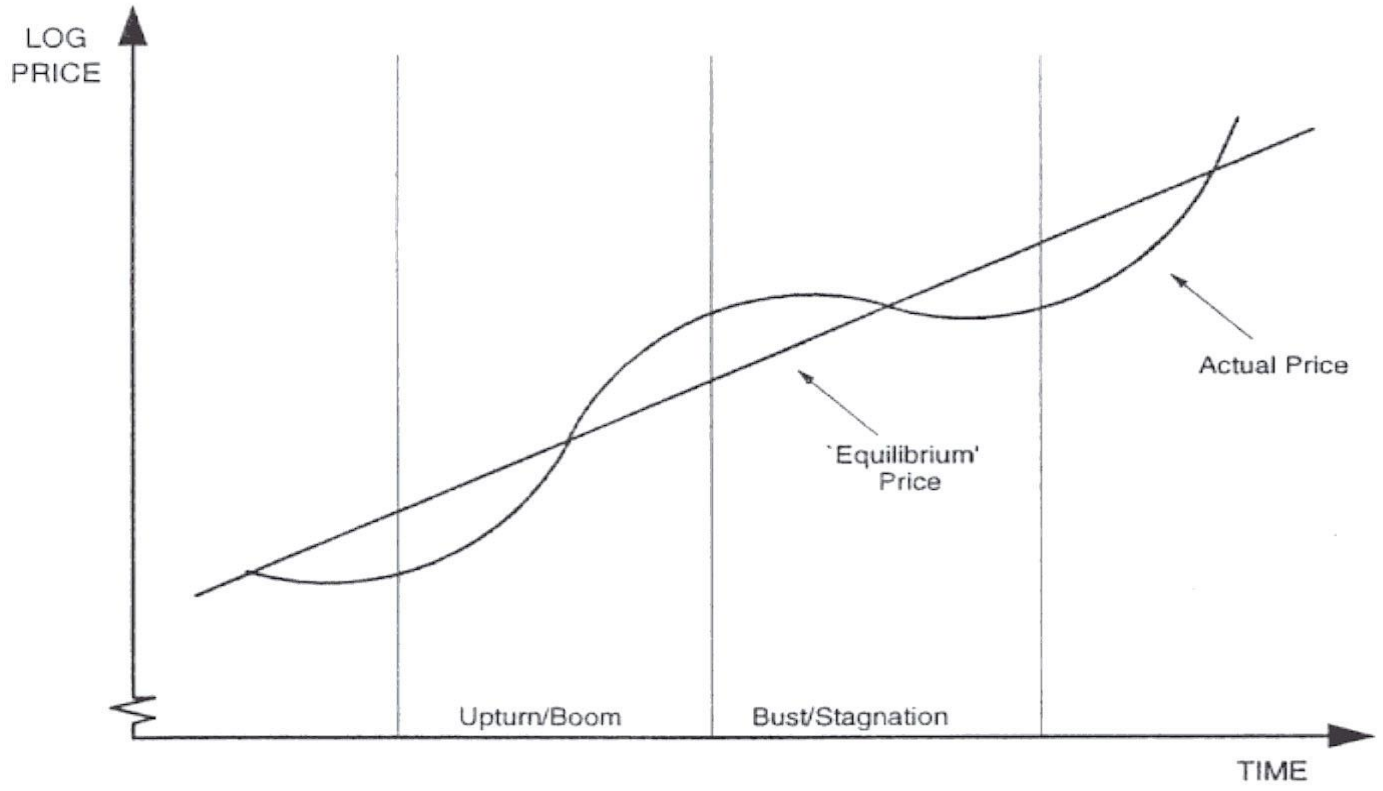
- Often pain-staking
- Multiple constraints to be satisfied
- Optimisation by options and feasibility studies

Market Cycles

(Source: BIS Shrapnel - *Building in Australia*, 20th Edition)

Chart 1.1

PRICE AND ACTIVITY IN THE BUILDING INVESTMENT CYCLE



The Building Cycle

Natural stock cycle

- Fuelled by uncertainty and long lead times

Uncertainty in:

- Underlying demand
- Building activity
- Prospective yields

Cycle - Upturn

- New demand emerges
- Rental prices increase
- Increasing yields attract investors
- Sale prices and activities to rise
- Attracts yield-seeking investment

Cycle - Boom

- Entry of growth capital
- Volatile investment flows
- Rising prices attract new investors, further raising prices
- Developers enter as margins improve
- Over-heated - activity overshoots
- Overvalued prices lower yields

Cycle - Bust

- Oversupply & low rental yields
- Yield-seeking investors withdraw
- Sales, prices & activity fall
- Average prices distorted by forced sales
- Prices flatten (fall in real terms)
- Activity very low as prices below vendor's expectations

Cycle - Stagnation

- Activities stabilise at lower levels
- Excess stocks absorbed over time
- Lasts until demand gets ahead of stock levels

Cycle Characteristics

Dwellings

- 5-8 years
- Activity upturns of 50-80%

Offices

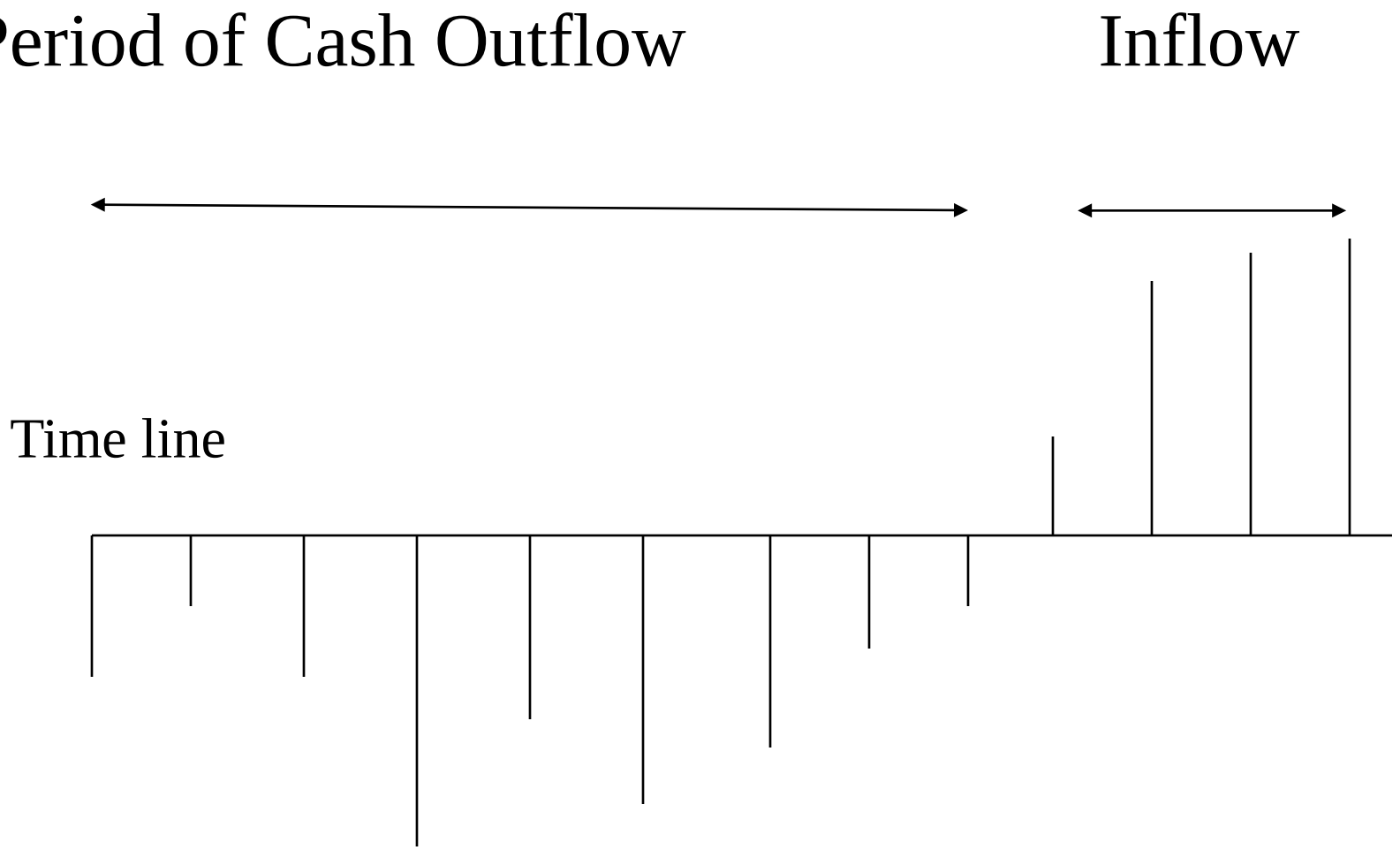
- up to 15 years
- Activity by 400% during upturn
- Boom can last 6 years
- Price rises of 30-80%

Hypothetical Development Equation

- “Value of Finished Product” = land value + dev costs + finance costs + profit

- Value of Land = Value of Finished Product that is Gross Realisation – (dev costs + finance costs + profit)

Typical Cash Flow Profile



Real Estate Financial Modelling

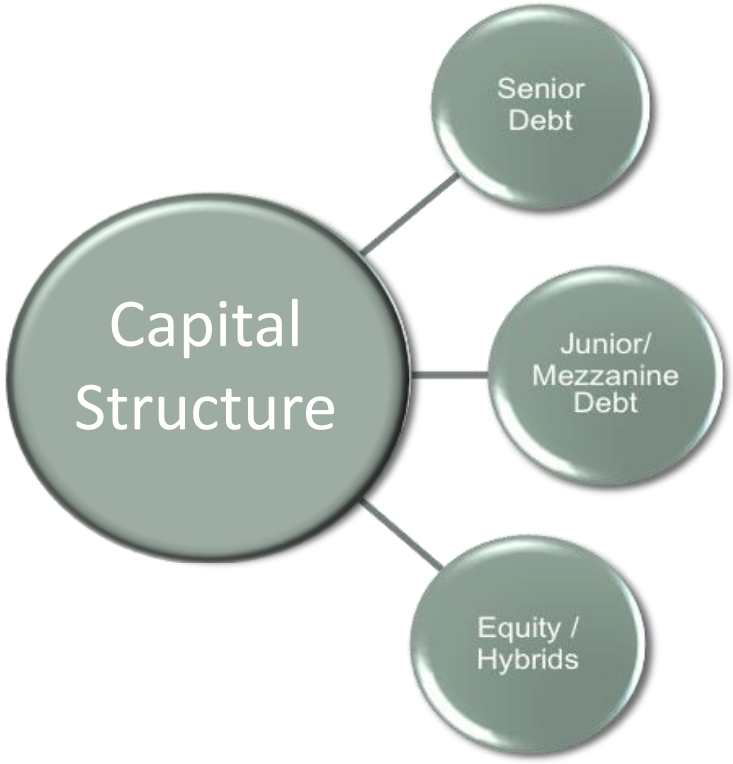
Six important financial factors

Application	Type	Compounding	Discounting
1) FV of $1	Capital Sum	$(1 + i)^n$	
2) PV of $1	Capital Sum	Reciprocal of FV of $1	$(1 + i)^{-n}$ or $1/(1+i)^n$
3) FV of $1pp	Cash Flow	$[(1 + i)^n – 1]/i$	
4) Sinking Fund Factor	Cash Flow	Reciprocal of FV of $1pp	$i/[(1 + i)^n – 1]$
5) PV of $1pp	Cash Flow		$[1 – (1+i)^{-n}]/i$
6) Mortgage Factor	Cash Flow	$i/[1 – (1 + i)^{-n}]$	

Capital Markets – Four Categories

	Public Markets	Private Markets
Equity Assets	Stocks REITs Mutual Funds	Real Property Private Equity Hedge Funds
Debt Assets	Bonds MBS (Mortgage Backed Security) Money Instruments	Bank Loans Whole Mortgages Venture Debt and LBOs

Senior Debt – gearing levels across the market



Development Property

- Bank funding capped at 70% - 80% of the development cost
- Pre-sales required to cover 100% of the bank debt

Commercial Property

- LVR up to 60% - 65% for senior and 70% - 80% with sub/mezzanine debt
- REITS aim for gearing of <40% to maintain investment grade rating

Equity Multiple

- Very basic metric
- Doesn’t take into consideration discounting or time value of money
- Its simplicity makes it popular

The equity multiple is arrived at as follows:

$$EM = Er/Ei$$

where:

Ei = equity invested

Er = total cash returned (income and capital)

EM = equity multiple

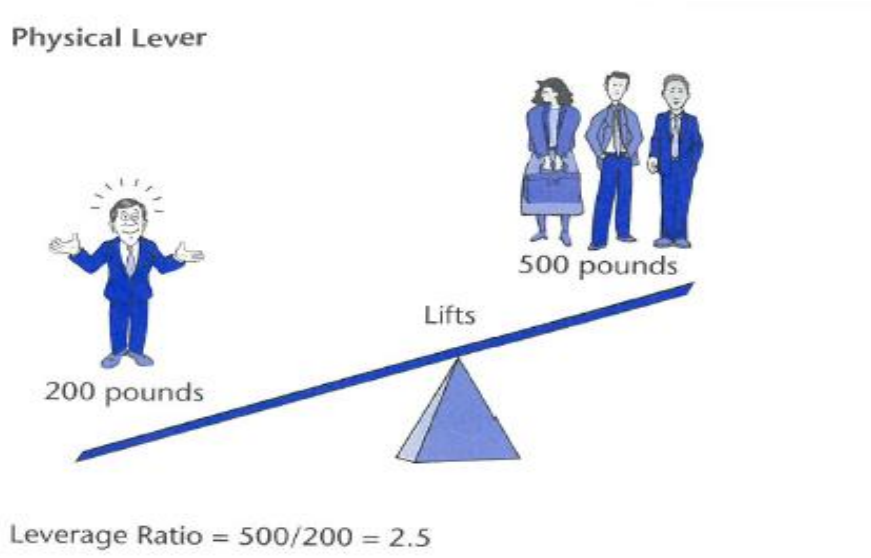
Mechanics of Leverage

- Analogy between financial and physical leverage proves helpful.
- $4m in equity can purchase $10m in property.
- Leverage Ratio = value of underlying asset divided by the value of the equity investment.

$$LR = \frac{V}{E} = \frac{(L+E)}{E}$$

Where:

V = Asset Value
L = Loan Value
E = Equity



Calculating Loan Payments and Balances

- There are **Four Basic Rules** for calculating loan payments and balances:
  - **Rule 1:** The interest owed in each period equals the applicable interest rate times the outstanding principal balance at the end of the previous period : $INT_t = (OLB_{t-1})\ _{rt}$.
  - **Rule 2:** The principal amortised (paid down) in each payment equals the total payment (net of expenses and penalties) minus the interest owed*:* $AMORT_t = PMT_t - INT_t$.
  - **Rule 3:** The outstanding principal balance after each payment equals the previous outstanding principal balance minus the principal paid down in the payment: $OLB_t = OLB_{t-1} - AMORT_t$.
  - **Rule 4:** The initial outstanding principal balance equals the initial contract principal specified in the loan agreement: $OLB_0 = L$.

Four Basic Rules

- Abbreviations

  L = Initial contract principal (the loan amount)

  R_t = Contract simple interest rate applicable for payment in period t

  INT_t = Interest owed in period t

  $AMORT_t$ = Principal paid down in the period *t* payment

  OLB_t = Outstanding principal balance after the period *t* payment has been made

  PMT_t = Amount of the loan payment in period *t*

Applying the Rules to Design Loans

- There are a number of loan types which the Four Rules can be applied to:
  - Interest-only loan
  - Constant Amortization Mortgage (CAM)
  - Graduated Payment Mortgage (GPM)
  - Adjustable Rate Mortgage (ARM)

Interest Only Loan

- $PMT_t = INT_t = \text{OLB}_t \text{ x } i$
  - or equivalently: $OLB_t = L$, $AMORT_t = 0$ for all t
- Oldest and most basic of loan payments.
- In interest only loan, no amortization of principal
  - Outstanding loan balance remains constant throughout the life of the loan
  - Entire original principal must be paid back to the borrower in a lump sum (balloon) at the loan's maturity date.
  - Regular loan payments consist purely of interest
  - If interest rate is fixed, loan payments will remain constant

Interest Only Loan

- Normally, a relatively short term maturity 4 to 5 yrs, so best is used to finance property investments with correspondingly short holding periods (or re-finance during longer holding periods).

- Used extensively for taxation purposes.

- The repayment spike at the end of the loan confronts the borrower with the need to either refinance the loan or sell the property when the loan matures.
  - Can cause problems if either the property or the debt market is not favourable at that time.

Interest Only Loan

- Classical payment pattern of long-term corporate and government bonds and is not unusual in commercial mortgages.
- Has advantage to the borrower of regular payments that are less than those of equivalent amortising loan.
- Because principal is not paid down, maximises the total dollar magnitude of interest paid over the lifetimes of the loan, compared to other amortizing loans.

Key Features of Mortgage Backed Securities

1. **Securitisation**: process of pooling mortgages

2. **Tranching:** separation of securities into classes

3. **Bond Credit Rating:** the riskiness of an investment

4. **Other:** Loan maturity, waterfall (tiering of creditor payment priority)

Corporate Real Estate & Investment Real Estate

Ownership Objective

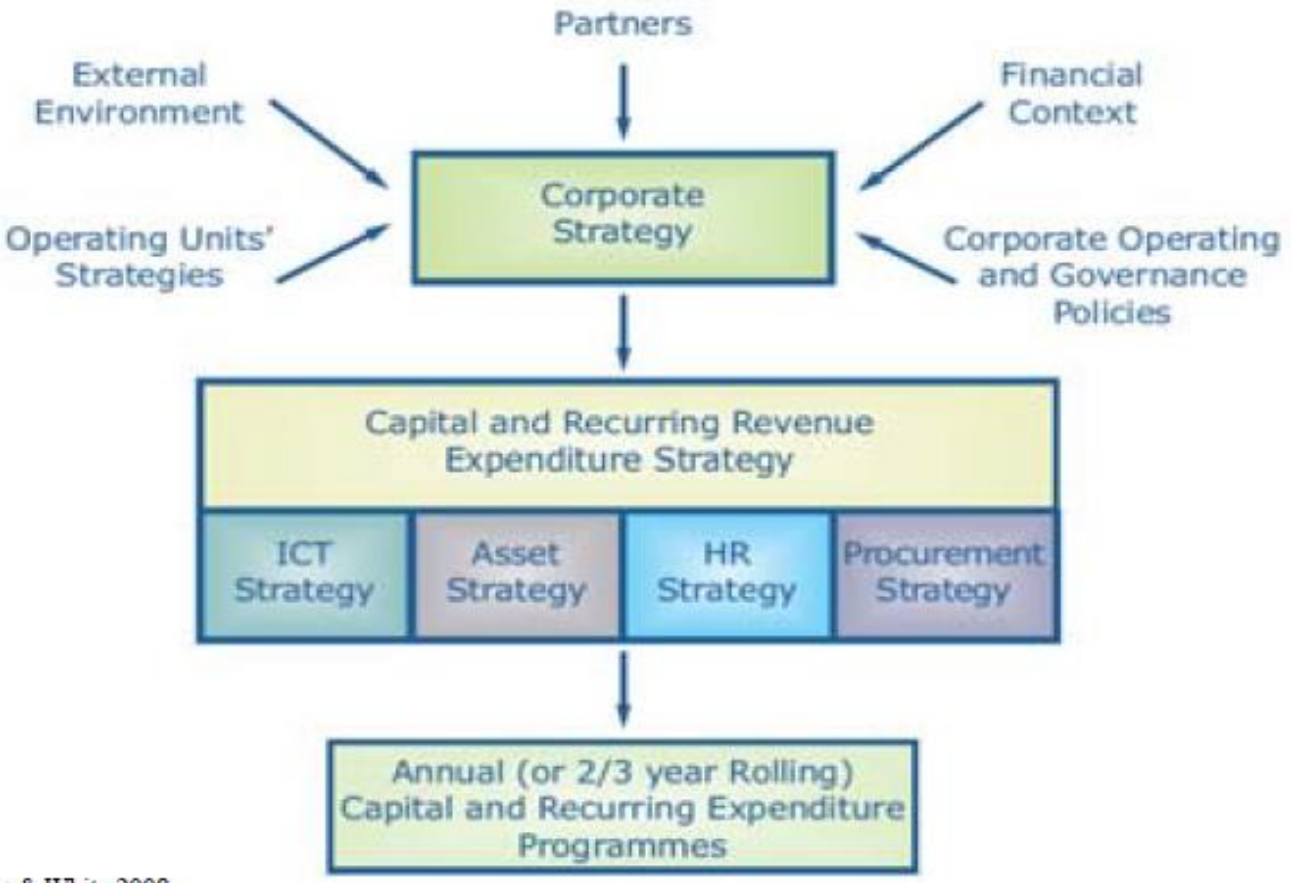
Corporate Property

- Business Base
- Corporate Statement
- Enabler of Business
  - Short and Long-term property solutions
- Infrastructure Facility

Investment Property

- Return on Investment
- Diversification by
  - Location
  - Sector
  - Size
- Direct and Indirect
  - AREITS
  - Syndicates

Strategic Asset Management



urce: Jones & White 2008

Changing Perception of Property

- The separation of capital and recurrent costs for budgeting purposes militates against a whole- of-life approach to asset management. Assets purchased with capital funds once approved, are treated effectively as ‘free’ goods in subsequent years so there is little ongoing incentive to ensure service potential is optimised.’
- *ANAO*

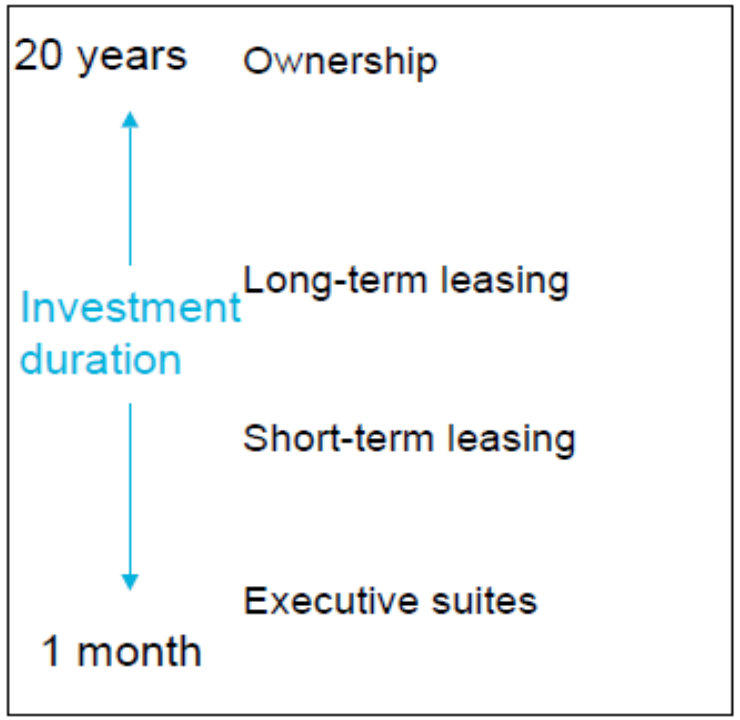
CRE Strategic Framework

- **Lease / Own Strategies**

- Business Criticality - Portfolio Approach
- Core Accommodation.
  - Long lease – own
- Flexible Accommodation
  - Lease – medium to short term
  - Serviced - Licensed

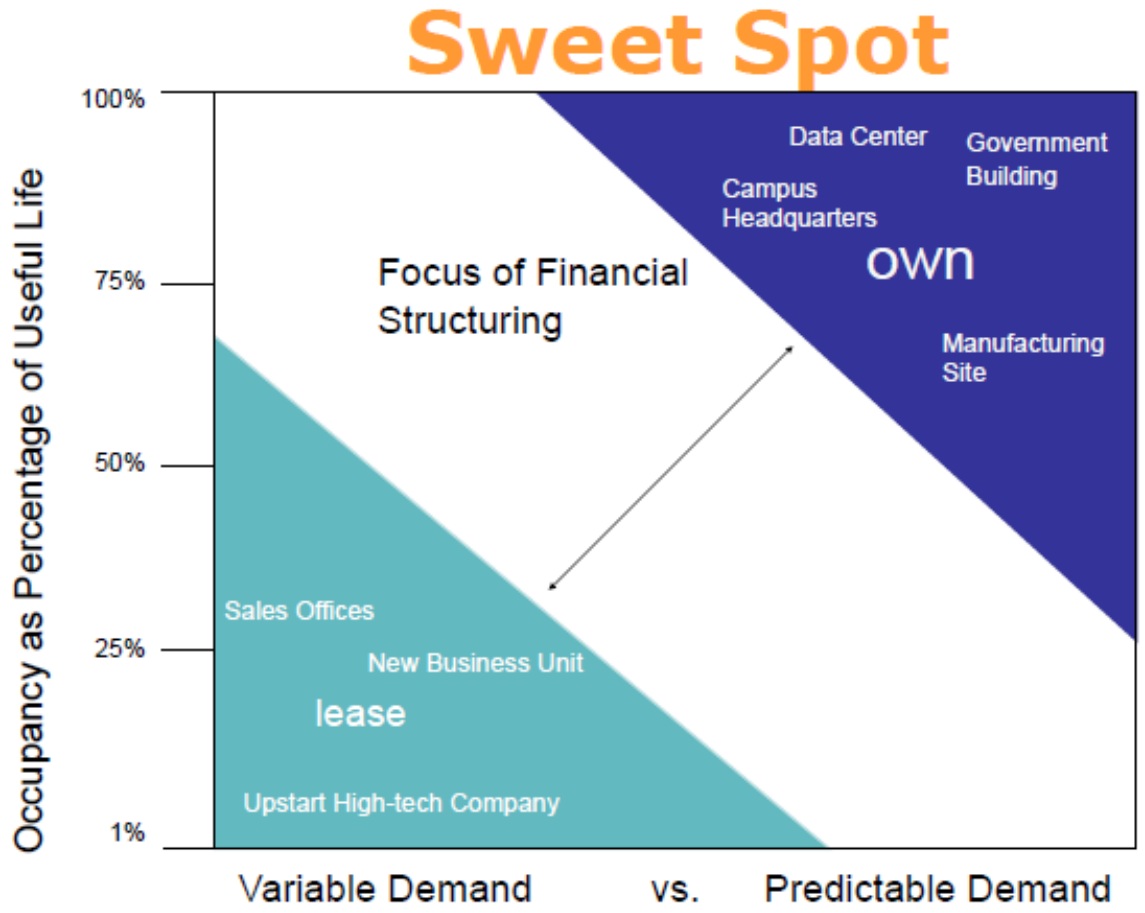
CRE Strategic Framework

Occupation Duration



- Occupation duration is a measure of capital at risk in property
  - Duration of a lease is its term
  - Duration of ownership is effectively 15-25 years
- Longer duration = more capital at risk
- Short Duration = market exposure

CRE Strategic Framework



i. Krzysko & C. Marciniak; Optimizing real estate financing – Journal Corporate Real Estate V3, #3

CRE Strategic Framework

- **There are Two Decisions Involved: Investing & Financing**
- Financial management is comprised of two distinct decisions
  - Investing decision
    - What assets should we acquire?
    - Risk v return
  - Financing decision
    - How should we pay for the assets?
    - Financing cost, capital structure considerations
- Overall objective is to maximize net present value

CRE Strategic Framework

Cash Flows

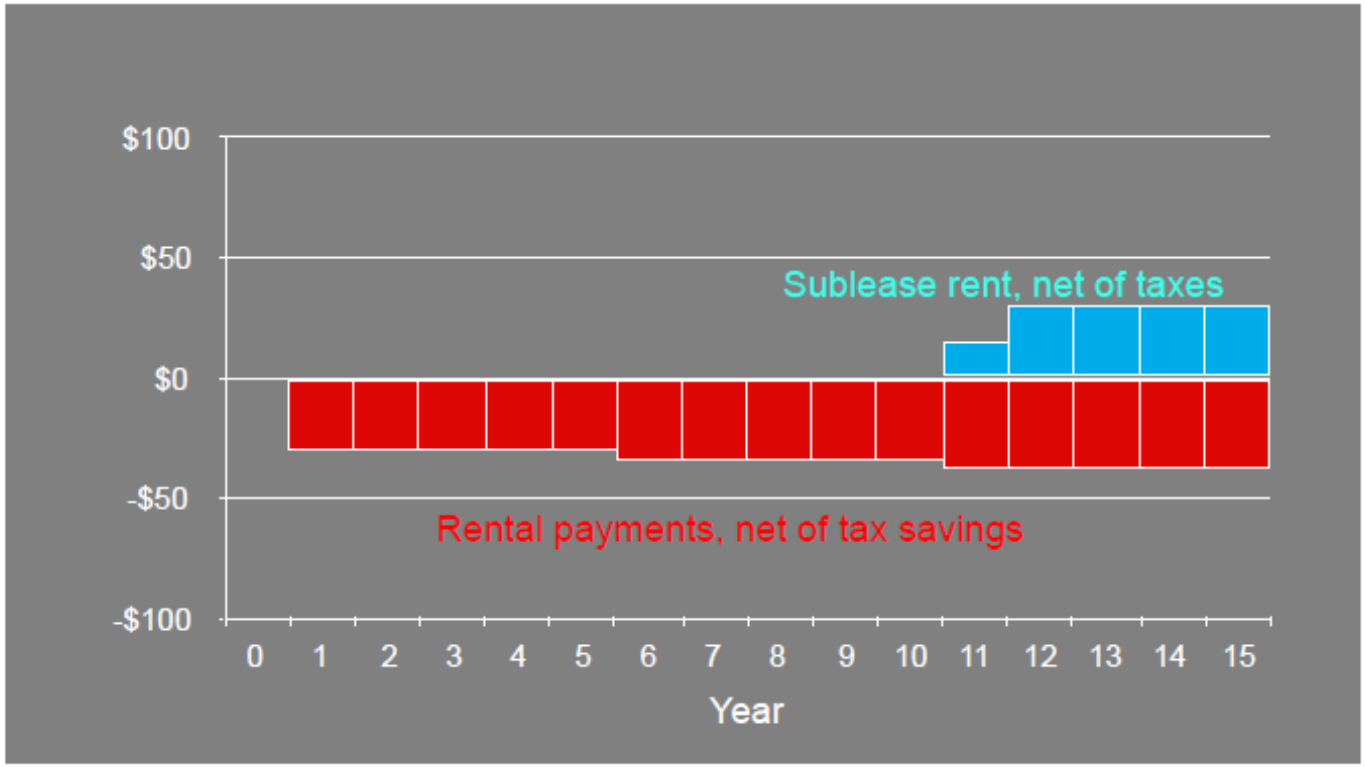
- Ownership has three cash flows
  - Initial investment
  - Tax benefit (Tax Shield) resulting from depreciation
  - Residual value
- Lease has one (sometimes two) cash flows
  - Lease payment
  - Sub lease payments (receipts)

CRE Strategic Framework

Cash Flow Forecast – Own

CRE Strategic Framework

Cash Flow Forecast – Lease



ESG and Real Estate

- Environmental, Social and Governance – reporting performance of key metrics against benchmarks
- Why does ESG matter in Real Estate
  - Availability of funding
  - Regulatory compliance
  - Consumer behaviour in the space market
  - GHG emissions from buildings
- National Framework for Energy Efficiency and Renewable Energy Targets
- Jevon's Paradox - Improvements in efficiency of resource use can lead to increased consumption of that resource
- GBCA – Green Star Rating
- NABERS – 6 Star System and Commercial Building Disclosure Scheme
- Green Leases – Government National Green Leasing Policy

Questions?