Real Estate Investment: A Strategic Approach
Fourth Edition, 2023

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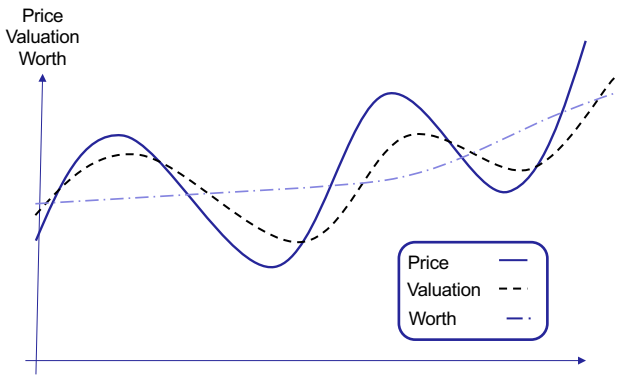
Chapter Four

Pricing Real Estate and the Investment Process

Price, valuation and worth



Source: Russell Chaplin

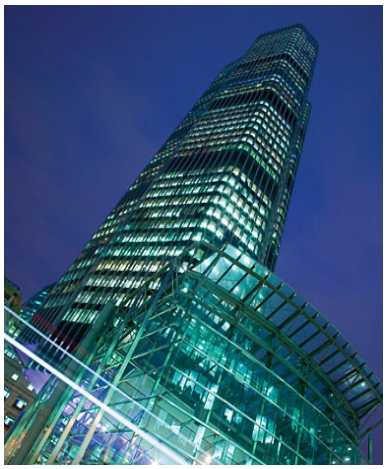
What is this building worth?

The Al Hamra Business Tower has a total of 62 office floors ranging from 450 sq m. - 1,750 sqm, built on top of Al Hamra Shopping Centre.

Construction of the skyscraper started in 2005 and it was completed in 2011. It is the tallest carved concrete skyscraper in the world, and the thirtieth tallest building in the world at 414 m (1,358 ft).

$750m

A good deal?



Tower 42 was sold in 2011 for £283m.

This was considered Britain's first true skyscraper when it was built for NatWest 20 years ago. It generates a rental income of around £20 million a year.

It was acquired by South African tycoon Nathan Kirsh.

A good deal?

30 St Mary Axe – The Gherkin - was sold in 2014 for £710m.

The top rents for the space (total 470,000 sq ft) are around £60 psf.

Total rents passing are believed to be around £24m. The anchor tenant of the 40-floor building is Swiss Re.

It was acquired by the Brazil-based Safra Group.

What are the important numbers?

What are the important numbers?

- £283m and £20m?
- £710m and £24m?

- Investors have paid 14 times rent in 2011
- This is a yield of 1/14 = 7%

- Investors have paid 29 times rent in 2014
- This is a yield of 1/29 = 3.5%

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Ferry Hinksey Road, Oxford, UK (2009)

- Ferry Hinksey Road (off Botley Road) Oxford
- A modern two storey business unit, gas heating, flexible ground floor use with loading door, parking. Please note that this property is also available freehold
- 2,504 sq ft
  Rent: £17,500 pa (£7 psf)
  Price: £220,000 (£88 psf)
- Tenure: Freehold, Leasehold

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What are the key numbers in this slide?

- 2,504 sq ft
- Rent: £17,500 pa (£7 psf)
- Price: £220,000 (£88 psf)

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What are the key numbers in this slide?

- Rent: £17,500 pa (£7 psf)
- Price: £220,000 (£88 psf)

- £88m/£7m = 12.57
- £7m/£88m = 7.96%

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What is the expected cash flow?

- Initial rent £17,500 net (FRI) = NOI (net operating income)
- Assume new 10 year lease at an indexed rent
- Assume lease is renewed in year 10
- Assume we sell in year 10 at the same cap rate
- Assume annual in arrear rent
- Assume rents rise at 1.5% pa (expected inflation)
- Rent year 11: £20,309
- Sale price year 10 = expected rent year 11/cap rate = £20,309/.08 = £253,868

The expected cash flow

Build this cash flow in Excel

Year	Rent (£)	Sale price (£)
2010	17500	
2011	17763	
2012	18029	
2013	18299	
2014	18574	
2015	18852	
2016	19135	
2017	19422	
2018	19714	
2019	20009	253,868*

** £20,309/.08*

The discount rate

- R = RFR + RP
- where
  - RFR is a risk free rate
  - RP is a risk premium

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The risk premium: components

REAL ESTATE RISK (1.5%)
The minimum return above bonds for the best asset: global risks
VOLATILITY (WEST END=0.5%)
Volatility of total return, default risk, lease renewal risk
TRANSPARENCY (WEST END=0.5%)
JLL Transparency Index Composite Score
LIQUIDITY (RCA) (WEST END=0.25%)
RCA Investment: % of market trading

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The discount rate

- R = RFR + RP
- where
  - RFR is a risk free rate
  - RP is a risk premium
- In 2010:
  - RFR = 3.5%
  - Total required return?
  - Backsolved risk premium?
  - Poll?

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The discount rate

- R = RFR + RP
- where
  - RFR is a risk free rate
  - RP is a risk premium
- If
  - RFR = 3.5%
  - Risk premium say 6% for a poor quality industrial
- then R = **9.5%**

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The discount rate?

- In equilibrium:
- **R = K + G / K = R – G** where
  - K is an initial yield or cap rate
  - R is the required return or discount rate
  - G = growth in rents (net of depreciation)
- So RFR + RP = K + G
- 3.5% + 6% = 8% + 1.5%
- R = K + G = 8% + 1.5% = **9.5%**

- Amend spreadsheet

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DCF valuation

Year	Rent (£)	Sale price (£)	PV factor @ 9.5%	PV (£)
2010	17500		0.9132	15982
2011	17763		0.8340	14814
2012	18029		0.7617	13732
2013	18299		0.6956	12729
2014	18574		0.6352	11799
2015	18852		0.5801	10937
2016	19135		0.5298	10138
2017	19422		0.4838	9397
2018	19714		0.4418	8710
2019	20009	253,868*	0.4035	110514
* £20,309/.08			**Total**	**218750**

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If our required return is higher?

- R = RFR + RP
- R = 3.5% + 7% = **10.5%**

- We would pay less

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DCF valuation

Year	Rent (£)	Sale price (£)	PV factor @ 10.5%	PV (£)
2010	17500		0.9049	15837
2011	17763		0.8189	14548
2012	18029		0.7412	13362
2013	18299		0.6707	12274
2014	18574		0.6070	11274
2015	18852		0.5493	10356
2016	19135		0.4971	9512
2017	19422		0.4499	8738
2018	19714		0.4071	8026
2019	20009	253,868	0.3685	100910
			Total	**204837**

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Should we buy it?

- Look at the inputs:
  - Rent growth 2.5%
  - Risk premium 4.5%
  - Exit cap rate 6.5%
- IRR 12.03%
- Required return 8%
- Maximum price to deliver 8%: £289,157, say £290,000
- Should we buy it? YES!

- Options/alternative uses?

DCF valuation

Year	Rent (£)	Sale price (£)	PV factor @ 8%	PV (£)
2010	17500		0.9259	16204
2011	17938		0.8573	15379
2012	18386		0.7938	14595
2013	18846		0.7350	13852
2014	19317		0.6806	13147
2015	19800		0.6302	12477
2016	20295		0.5835	11842
2017	20802		0.5403	11239
2018	21322		0.5002	10666
2019	21855	344,638*	0.4632	169757
** £22,401/.065*			**Total**	**289157**

A good deal?

30 St Mary Axe – The Gherkin - was sold in 2014 for £710m.

The top rents for the space (total 470,000 sq ft) are around £60 psf.

Total rents passing are believed to be around £24m. The anchor tenant of the 40-floor building is Swiss Re.

It was acquired by the Brazil-based Safra Group.

Gherkin: analysis

- Capital value: £710m
- Rent passing: £24m
- Market rent: 470,000 sq ft at £60 psf = £28m

- Cash flow?
- Assume average three years to market review

- We pay £710m plus buyers' costs of say 6.25% (£754m in total)
- We receive £24m for three years
- We then expect to receive £28m thereafter
- But what will happen to market rents in the next three years?

Gherkin: analysis

- Research suggests market rents will rise by 5% p.a. in the next three years
- Expected rent in year 4: £28m* (1.05)^3 = £32.5m

Gherkin: analysis

Year	Capital	Income
2014	-754	
2015		24
2016		24
2017		24
2018		32.5
2019		32.5

Gherkin: analysis

- Assume we sell in year 5. What price?
- Assume a yield of 4% - a multiplier of 25
- Sale price = £32.5m * 25 = £812.5m
- Our sale costs are 1.25%
- Net receipts are £802m

- Cash flow?
- IRR?

Gherkin: analysis

Year	Capital	Income	Total
2014	-754.4		-754.4
2015		24.0	24.0
2016		24.0	24.0
2017		24.0	24.0
2018		32.5	32.5
2019	802.3	32.5	834.8

IRR: 4.73%

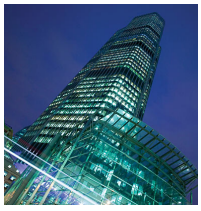
Tower 42: analysis

- What would we now pay for Tower 42?
- Assume rents have risen from £20m to £25m
- Assume a yield of 5% - a multiplier of 20 (older building)
- Valuation: £25m * 20 = £500m
- Capital gain: £500m - £283m = £217m

- Leverage?
- Costs?

Tower 42: analysis

- Tower 42 cost £283m
- Assume Kirsch borrowed 60%: £170m
- Equity invested: £113m plus costs say £120m
- Interest say 5% on £170m = £8.5m p.a.
- Net cash flow £20m - £8.5m = £11.5m
- Net sale proceeds £500m - £170m less costs
- = say £325m
- Cash flow? IRR?



Tower 42: analysis

Year	Capital	Income	Total
2011	-120		-120
2012		11.5	11.5
2013		11.5	11.5
2014		11.5	11.5
2015		11.5	11.5
2016	325	11.5	336.5

IRR: 

Tower 42: analysis

Year	Capital	Income	Total
2011	-120		-120
2012		11.5	11.5
2013		11.5	11.5
2014		11.5	11.5
2015		11.5	11.5
2016	325	11.5	336.5

IRR: 28.89%

The Fisher Equation

- The (nominal) risk free rate comprises the real risk free rate and a reward for expected inflation

$$\mathbf{R = RFR + RP} \text{ and } \mathbf{RFR = l + i}$$

so

$$\mathbf{R = l + i + RP}$$

- The total required return comprises three parts
  - **l** is a reward for liquidity preference
  - **i** is expected inflation
  - **RP** is the risk premium

The Fisher Equation and bonds

$$\mathbf{R = RFR^N + RP}$$

$$\mathbf{R = l + i + RP}$$

- Simplistically, the nominal rate is equal to the real risk free rate plus expected inflation, so

$$\mathbf{RFR^N = RFR^R + i}$$

- $\mathbf{RFR^R = l}$, from the required return on index-linked bonds: say 1.5%

The Fisher Equation and bonds

- **I** is the real risk free rate (**RFR^R**)
- **I + i** is required return on conventional bonds: say 4.0%
- **I + i** is the nominal risk free rate (**RFR^N**)
- **RFR^N – RFR^R = i:** the yield on conventional bonds - yield on index-linked bonds = the expected rate of inflation

Risk free rates/expected inflation

- **RFR^N – RFR^R = i:** the yield on conventional bonds - yield on index-linked bonds = the expected rate of inflation
  - 4% - 1.5% = expected rate of inflation = 2.5%
- But are fixed interest government bonds risk free?
  - For pension funds, liabilities are real and fixed interest investments are risky; so there must be a risk premium in the pricing of conventional bonds
- Then **RFR^N – RFR^R = I + Rp**
  - 4.0% = 1.5% + i + RP
  - Say 4.0% = 1.5%+ 2% + 0.5%
  - Inflation expectations are **2%**, not 2.5%

Indexed or conventional bonds?

- Indexed: 1.5% + inflation
- Expected nominal return: 1.5% + 2% = 3.5%
- Expected real return: 1.5%

- Conventional: 4% + 0%
- Expected nominal return: 4% + 0% = 4%
- Expected real return: 4% - 2% = 2%

- Available risk premium 0.5% on conventional

Bonds or property?

$$R = RFR^N + RP$$

- Expected return on conventional gilts: 4%
- Expected return on property and equities: 4% + RP
- Expected return on property say 5-6%
- This is the observed yield in 1935

- But observed yields in 1955 were 5% for bonds and 4% for property and equities
- How can this 'reverse yield gap' happen?

Gordon's Growth Model

- The reverse yield gap is explained by inflation and growth: the initial return is not the total expected return
- Assume a constant rate of growth in nominal income (G)
- Then: **K = R - G**
  - where k is an initial yield
  - R is the required return
  - G (nominal) = g (real) + i (inflation)
- **R** = **RFR^N + RP**, so
- **K = RFR^N + RP - G**

Gordon's Growth Model: example

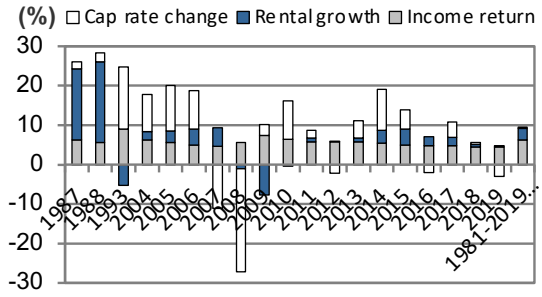
K = RFR^N + RP – G

- Assume rents rise at 2.5%
- Assume a RP of 3%
- What is the correct yield?

K = RFR^N + RP – G = 4% + 3% - 2.5% = **4.5%**

What drives growth?

- Inflation: say 2% in future
- Real growth: say -0.5%?
- Nominal growth: say 1.5%?



Note: geometric means
total return 8.92%
real total return 5.81%
rent growth 2.95%
inflation 3.50%
real rent growth -0.55%
income 6.14%
pricing 0.34%

How do we estimate the risk premium?

- Using ex-post returns
  - 3% is the mean of the historic delivered property return premium over gilts
- Using required returns
  - What is the extra return over risk free assets that investors currently need to invest in property?
- Using the Capital Asset Pricing Model (CAPM)

Using CAPM

- Is the real estate market integrated or not?
  - Is the relevant real estate risk determined by its contribution to the risk of a diversified portfolio (institutional investor)?
- What is the beta (risk relative to the market) of property?
  - $E(Ra) = RFR^N + b(Rm-RFR^N)$
  - Assue Rm is 7%. Is property beta > or < 1? What is E(Ra)?
  - Use REITs as evidence?

Required return? Short term investor

Risk and illiquidity premium: 3%
Transaction and management costs: 1.5%
Risk free rate: 1.5%

Required return? Long term investor

Risk and illiquidity premium: 1.5%
Transaction and management costs: 0.5%
Risk free rate: 2%

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How depreciation affects property

- Income growth is usually measured for hypothetical continually new properties
- Forecasts are estimated in the same way
  - what will best office rents be in Paris in 2003?
  - what is the rate of growth for best buildings?
- Real buildings wear out
  - refurbishment expenditure
  - rents decline relative to new
  - cap rates rise relative to new
- UK evidence

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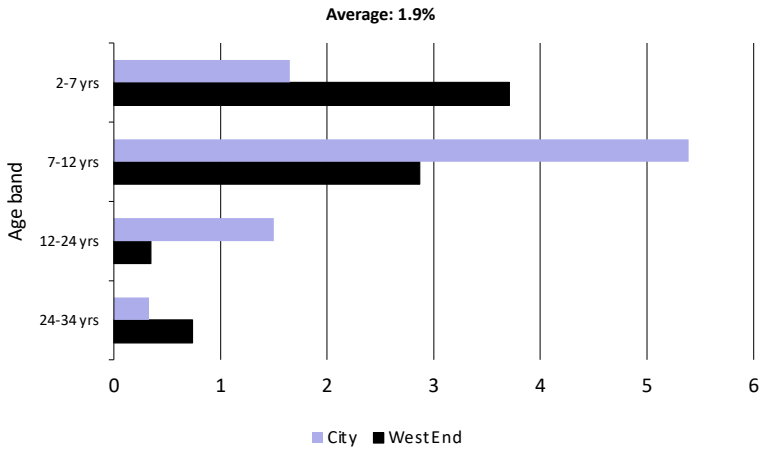
Depreciation : London offices (%)



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A property valuation model

- Assume:
  - constant rate of depreciation (D) = 1%
  - RP for office property = 3%
  - G = long term average of 2.5% nominal (0.5% real)
- Then:

  $K = RF^N + RP - G + D$

  K = 4% + 3% - 2.5% + 1% = 5.5%
- The correct yield is 5.5%
- If the current yield is 5%: offices are expensive
- If the current yield is 6%: offices are cheap

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Reminder: risk free rates

- For pension funds, liabilities are real and fixed interest investments are risky; so there may be a risk premium in the pricing of conventional bonds

- **$RFR^N - RFR^R = I + Rp$**
- 4.0% = 1.5% + i + RP
- Say 4.0% = 1.5%+ 2% + 0.5%
- Inflation expectations are **2%**, not 2.5%

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Valuing asset classes

	RFR^R	+ i	+ RP	=	k	+ G	- d
Indexed bonds (RFR^R)					0.5		
Fixed interest bonds					2.5		
Equities					2.5		
Property					5.0		
Japanese bonds					0.5		
Cash					1.0		

$RFR^N - RFR^R = I + Rp$

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Case

- Wilson Street