Real Estate Investment: A Strategic Approach
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Chapter Eight

Capital Structure: Equity and Debt

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The Dubai case

Losing the plot

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Price data: Dubai residential

Type		2002	2003	2004	2005	2006	2007	2008	2009
Apartments	Burj Dubai	-	-	1,200	1,275	1,350	2,800	4,500	2,000
		850	836	900	1,000	1,050	1,400	1,975	1,100
	Greens	500	500	725	875	950	1,250	1,700	1,000
Villas	Lakes	550	575	700	875	1,250	1,450	2,150	1,200
	Meadows	450	500	600	800	1,150	1,500	1,775	1,100
	Ranches	450	475	620	790	1,150	1,450	2,120	1,000
	Springs	420	485	500	640	1,025	1,500	1,850	1,000

The Dubai case

- In 2007, Mr X pays a 10% deposit for a $1m flat under construction. Prices rise. The flat goes up in value but what is his deposit worth one year later? If he borrows 50% of the deposit, what happens to his equity of $50k?
- In 2008, Ms Y pays a 10% deposit for a $1m flat under construction. Prices fall. The flat goes down in value but what is her deposit worth one year later? If she borrows 50% of the deposit, what happens to her equity of $50k?
- How sensitive to price rises and falls is (a) the value of their deposits and (b) their equity investment?
- What do you think are the rights and obligations of Mr X, Ms Y and the developer in each case?

The Dubai case

- In 2007, Mr X pays a 10% deposit for a $1m flat under construction. Prices rise. The flat goes up in value but what is his deposit worth one year later? If he borrows 50% of the deposit, what happens to his equity of $50k?

Agreed price of apartment		$1,000,000
Deposit	10%	$100,000
Balance to be paid		$900,000
Debt	50%	$50,000
Equity		$50,000
Growth/fall in values		42%
New value of apartment		$1,415,859
Value of deposit		$515,859
Growth in value of deposit		$415,859
Growth in value %		416%
New value of equity		$465,859
Growth in equity value %		832%

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The Dubai case

- In 2008, Ms Y pays a 10% deposit for a $1m flat under construction. Prices fall. The flat goes down in value but what is her deposit worth one year later? If she borrows 50% of the deposit, what happens to her equity of $50k?

Agreed price of apartment		$1,000,000
Deposit	10%	$100,000
Balance to be paid		$900,000
Debt	50%	$50,000
Equity		$50,000
Growth/fall in values		-48%
New value of apartment		$522,713
Value of deposit		-$377,287
Growth in value of deposit		-$477,287
Growth in value %		-477%
New value of equity		-$427,287
Growth in equity value %		-955%

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The Dubai case

- How sensitive to price rises and falls is (a) the value of their deposits and (b) their equity investment?

Approximation (ignoring interest costs)	
Growth in house prices	42%
Deposit percentage	10%
Deposit equity	50%
Equity as % of price	5%
Effective leverage	20:1
Growth in equity	840%

The Dubai case

- What do you think are the rights and obligations of Mr X, Ms Y and the developer in each case?
- What does the contract say? What options are arranged and determined by the contract?
- Does the buyer have a right or a right (to buy) and an obligation (to pay the full price)? Does the seller have the right (to sell) and an obligation (to deliver)?
- Or: does the buyer have a right or a right (to buy) and no obligation (to pay the full price)?

Security for debt finance

- First charge
  - Bestows rights of ownership through ability to repossess
  - Ranking with respect to other creditors
- Second charge
  - Same rights as first charge but subordinated to first charge
- Guarantees
  - Personal (personal wealth) or corporate (balance sheet)
  - Interest or principal
  - Limited and unlimited
- Recourse
  - Full recourse and limited recourse
- Preferred equity
- Ordinary equity

Debt terms

- Loan to value ratio - LTV – say maximum 80%
  - Outstanding loan as a percentage of value
- DSCV – debt service coverage ratio - say 1.2
  - Stabilised NOI / annual interest payment

The effect of gearing: appraisal inputs

Space sq ft	50,000
Rental value/psf	£22.50
Current contract rent	£500,000
Remaining term	1 year
Occupancy	Single tenant
GRR year 1	£1,125,000
Occupancy	Multiple tenants

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Appraisal inputs

Growth	3.50%
Depreciation	2.00%
Resale cap rate (NOI)	7.00%
Inflation	2.50%
OpEx	£100,000
Vacancy	10%

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Appraisal inputs

Price	£12,000,000
Purchase fees	4.50%
Total outlay	£12,540,000
Sale fees	1.75%
Required return	8%

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Gross potential income

Year	GRR	Other income	GPI
0	£0	£0	£0
1	£500,000	£0	£500,000
2	£1,141,544	£0	£1,141,544
3	£1,158,332	£0	£1,158,332
4	£1,175,366	£0	£1,175,366
5	£1,192,651	£0	£1,192,651
6	£1,210,190	£0	£1,210,190

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Net operating income

Year	GPI	Vacancy	GEI	OpEx	NOI
0	£0	£0	£0		£0
1	£500,000	£0	£500,000	£102,500	£397,500
2	£1,141,544	£114,154	£1,027,390	£105,063	£922,327
3	£1,158,332	£115,833	£1,042,498	£107,689	£934,809
4	£1,175,366	£117,537	£1,057,829	£110,381	£947,448
5	£1,192,651	£119,265	£1,073,386	£113,141	£960,245
6	£1,210,190	£121,019	£1,089,171	£115,969	£973,201

Net resale price

- NOI divided by cap rate $(MV_t = NOI_{t+1} / cr_t)$ less sale fees
- $NOI_{t+1} = NOI_0 * (1+g)^{t+1} / (1+d)^{t+1}$
- Year 6 (t+1)NOI = £973,201
- Year 5 (t) cap rate = 7%
- $MV_t = NOI_{t+1} / cr_t$ = £973,201/0.07
- Sale fees are 1.75%
- (£973,201/0.07)*(1-0.0175) = £13,659,575

IRR, pre-tax, 100% equity

Year	NOI	Resale value	Cash flow
0	£0		-£12,540,000
1	£397,500	£0	£397,500
2	£922,327	£0	£922,327
3	£934,809	£0	£934,809
4	£947,448	£0	£947,448
5	£960,245	£13,659,575	£14,619,820
6	£973,201		
		IRR	**8.01%**

The impact of debt finance

- Real estate provides collateral for debt
- Financial mathematics changes
  - Initial capital investment reduced
  - Cash flow reduced
- Return on equity different
- Risk profile different
- Required return?
- Tax damage often reduced by debt
- Amortisation?

Return on leveraged equity

Return on leveraged equity > return on unleveraged equity

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Return on unleveraged equity > interest rate on debt

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Using 70% debt

- Total purchase outlay £12,540,000
- IRR on 100% equity 8.01%
- 70% loan £8,778,000
- 30% equity £3,762,000
- Fixed interest rate 5.5%
- Annual interest-only repayment £482,790
- Assume no amortisation
- Calculate the return on equity

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Return on leveraged equity

Approximation

Ke = Ka + (Ka – Kd)* [LTV / (1-LTV)]

ka = return on unlevered asset	8.01%
kd = cost of debt	5.50%
LTV = loan to value ratio	70.00%
ke = return on levered equity	**13.87%**

Return on leveraged equity

Year	Cash flow	Interest	Loan repaid	Cash to equity
0	-£12,540,000			-£3,762,000
1	£397,500	-£482,790		-£85,290
2	£922,327	-£482,790		£439,537
3	£934,809	-£482,790		£452,019
4	£947,448	-£482,790		£464,658
5	£14,619,820	-£482,790	-£8,778,000	£5,359,030
IRR project	**8.01%**		**IRR equity**	**13.09%**

Risk: impact of 1% higher exit yield

Year	Cash flow	Interest	Loan repaid	Cash to equity
0	-£12,540,000			-£3,762,000
1	£397,500	-£482,790		-£85,290
2	£922,327	-£482,790		£439,537
3	£934,809	-£482,790		£452,019
4	£947,448	-£482,790		£464,658
5	£12,912,373	-£482,790	-£8,778,000	£3,651,583
IRR project	**5.70%**		**IRR equity**	**6.16%**

Required return

- Required return on leveraged equity?
- Formula
- WACC

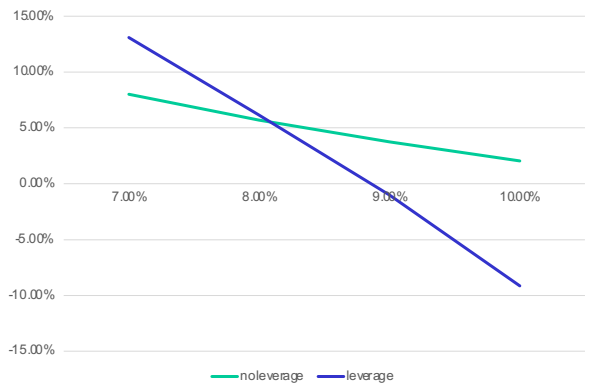
Risk: impact of 3% higher exit yield

Year	Cash flow	Interest	Loan repaid	Cash to equity
0	-£12,540,000			-£3,762,000
1	£397,500	-£482,790		-£85,290
2	£922,327	-£482,790		£439,537
3	£934,809	-£482,790		£452,019
4	£947,448	-£482,790		£464,658
5	£10,521,947	-£482,790	-£8,778,000	£12,61,157
IRR project	**2.04%**		**IRR equity**	**-9.15%**

Risk: impact of higher exit yields

Interest	**Exit cap**	**IRR project**	**IRR equity**
5.50%	7.00%	8.01%	13.09%
5.50%	8.00%	5.70%	6.16%
5.50%	9.00%	3.73%	-1.04%
5.50%	10.00%	2.04%	-9.15%
	Standard deviation	*2.57%*	*9.55%*

Risk: impact of higher exit yields



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The importance of debt terms

- Loan to value ratio - LTV – say maximum 80%
  - Outstanding loan as a percentage of value
  - £8,778,000 is 80% of approx £11m
  - Values can fall by 8.3% from £12m
- DSCV – debt service coverage ratio - say 1.2
  - Stabilised NOI / annual interest payment
  - Stabilised (year 2) NOI is 1.94 times interest
  - Rents can fall by 38%

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Using debt

- Tax on income 30%
- No tax on capital gains
- Assume paid in year of receipt

- **Calculate the return on equity after tax**
- (Required return after tax?)

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100% equity before and after tax

Year	Net cash flow	Tax	Net cash
0	-£12,540,000	£0	-£12,540,000
1	£397,500	£119,250	£278,250
2	£922,327	£276,698	£645,629
3	£934,809	£280,443	£654,367
4	£947,448	£284,234	£663,214
5	£14,619,820	£288,073	£14,331,747
IRR before tax	**8.01%**	**IRR after tax**	**6.15%**

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30% equity before and after tax

Year	Net cash to equity	Tax	Net cash
0	-£3,762,000	£0	-£3,762,000
1	-£85,290	-£25,587	-£59,703
2	£439,537	£131,861	£307,676
3	£452,019	£135,606	£316,414
4	£464,658	£139,397	£325,261
5	£5,359,030	£143,236	£5,215,794
IRR before tax	**13.09%**	**IRR after tax**	**10.84%**

Carried interest

- The manager of this investment has agreed with the investor that he/she will receive 20% of all leveraged pre-tax returns over 10% achieved on sale of the property
- What year 5 resale price achieves 10% IRR?
- This is a net resale price of £12,843,120
- This is a cap rate of 7.45%

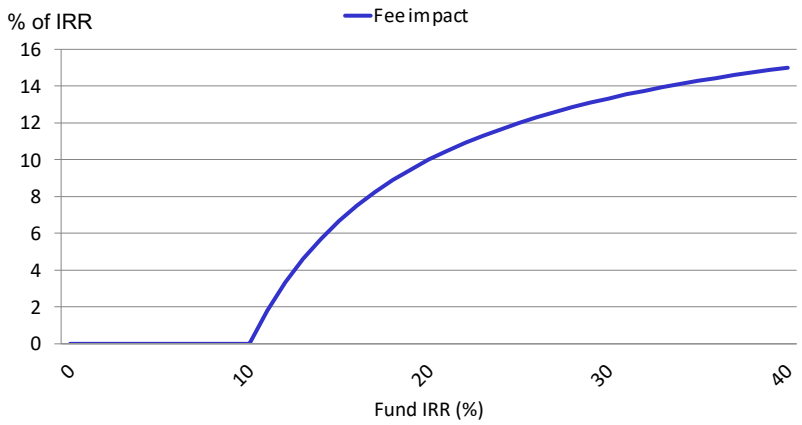
Carried interest: net exit value required

Year	Cash flow	Interest	Loan repaid	Net cash to equity
0	-£12,540,000			-£3,762,000
1	£397,500	-£482,790		-£85,290
2	£922,327	-£482,790		£454,646
3	£934,809	-£482,790		£467,350
4	£947,448	-£482,790		£480,214
5	£13,803,364	-£482,790	-£8,778,000	£4,542,574
			IRR equity	**10.01%**

Carried interest

- Expected surplus:
- £14,860,418 - £13,803,364 = £1,057,054
- 20% goes to manager: £211,411
- Net leveraged pre-tax return to investor: 12.33%
- Fee leakage: 13.09% - 12.33% = 0.76% = 5.81% of gross return

Performance fee impact: % of IRR



Source: PFR, 2010

The Aldersgate re-finance case

History

- Office building, City of London, EC1: 430,000 sq ft
- Constructed by Wimpey, 1990-2
- Let to Clifford Chance 1992
- Floorplates range from 5,000-20,000 square feet
- Close to new Crossrail station at Farringdon
- Gross rental income £14.25 million
- 27 tenants with one tenant 25% area
- 12 years term remaining on lease to main tenant
- WALE 7 years

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Finance

- Refurbished and re-let 2011
- Acquired by Middle East investor late 2013, £200m
- Used £100m equity, £100m five year debt
- Penalties for early repayment of debt years 1-3
- Net initial yield 4.5%
- Average rent/square foot = £38; ERV £54 per square foot
- Net initial yield 4.5%
- Formal valuation end 2014: £246m
- Estimated value at end 2015: £330m or £770 per sq ft

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What next?

- It is late 2015
- What are the owner's options?