

ANALYZING LONDON: A FINANCIAL MODEL FOR REAL ESTATE PORTFOLIO OPTIMIZATION



Introduction

The financial model developed herein offers a comprehensive analysis of a London-based real estate portfolio comprising 20 properties. Leveraging Python, synthetic data was generated to simulate various aspects of property ownership specific to the London market, such as rent, expenses, and financial performance metrics. The report delineates two distinct models: one for analyzing the overall portfolio and another for evaluating individual properties within the London real estate landscape.

PORTFOLIO OVERVIEW

The portfolio consists of a diverse range of properties including houses and apartments. Key metrics such as rent, council tax, insurance, maintenance, utilities, management fees, vacancy rates, purchase price, loan-to-value ratio, and equity are incorporated into the analysis.

FINANCIAL MODELS

Portfolio Analysis:

Return Analysis: Leveraged and unleveraged returns are calculated over a ten-year period.

Leveraged returns indicate a 9.93% internal rate of return (IRR), while unleveraged returns yield an 8.29% IRR.

Leveraged Returns	0	1	2	3	4	5	6	7	8	9	10
Equity	-	16,933,934.58									
Cash Flow, After debt Service	£	254,098.93	£ 312,155.33	£ 372,027.72	£ 433,772.07	£ 497,446.05	£ 563,109.10	£ 630,822.47	£ 700,649.26	£ 772,654.54	£ 846,905.32
Cash Flow Sale											£35,910,799.15
	-	16,933,934.58	254,098.93	312,155.33	372,027.72	433,772.07	497,446.05	563,109.10	630,822.47	700,649.26	772,654.54
Internal Rate of Return		9.93%									

Unleveraged Returns	0	1	2	3	4	5	6	7	8	9	10
Purchase	-	35,963,676.00									
Cash Flow, Operations	£	1,811,380.78	£ 1,869,437.19	£ 1,929,309.58	£ 1,991,053.93	£ 2,054,727.91	£ 2,120,390.96	£ 2,188,104.32	£ 2,257,931.12	£ 2,329,936.39	£ 2,404,187.17
Cash Flow, Sale											49615050.59
	-	35,963,676.00	1,811,380.78	1,869,437.19	1,929,309.58	1,991,053.93	2,054,727.91	2,120,390.96	2,188,104.32	2,257,931.12	2,329,936.39
Internal Rate of Return		8.29%									

Valuation and Sale: The net operating income (NOI) in Year 11 is projected at £2,480,752.53, with a corresponding sale price of £35,910,799.15.

NOI, Year 11	£	2,480,752.53
Cap Rate		5%
Sale Price		49615050.59
Mortgage	£	13,704,251.44
Net Sales	£	35,910,799.15

Cash Flow Analysis: Potential gross revenue, operating expenses, and cash flow after debt service are meticulously examined.

	1	2	3	4	5	6	7	8	9	10	11
Potential Gross Revenue	£ 2,332,164.00	£ 2,402,128.92	£ 2,474,192.79	£ 2,548,418.57	£ 2,624,871.13	£ 2,703,617.26	£ 2,784,725.78	£ 2,868,267.55	£ 2,954,315.58	£ 3,042,945.05	£ 3,134,233.40
General Vacancy	-£ 149,285.49	-£ 153,764.06	-£ 158,376.98	-£ 163,128.29	-£ 168,022.14	-£ 173,062.80	-£ 178,254.68	-£ 183,602.32	-£ 189,110.39	-£ 194,783.71	-£ 200,627.22
Effective Gross Revenue	£ 2,182,878.51	£ 2,248,364.86	£ 2,315,815.81	£ 2,385,290.28	£ 2,456,848.99	£ 2,530,554.46	£ 2,606,471.10	£ 2,684,665.23	£ 2,765,205.19	£ 2,848,161.34	£ 2,933,606.18
Operating Expenses	£ 371,497.72	£ 378,927.68	£ 386,506.23	£ 394,236.36	£ 402,121.08	£ 410,163.50	£ 418,366.78	£ 426,734.11	£ 435,268.79	£ 443,974.17	£ 452,853.65
Net Operating Income	£ 1,811,380.78	£ 1,869,437.19	£ 1,929,309.58	£ 1,991,053.93	£ 2,054,727.91	£ 2,120,390.96	£ 2,188,104.32	£ 2,257,931.12	£ 2,329,936.39	£ 2,404,187.17	£ 2,480,752.53
Loan Payments	£ 1,557,281.86	£ 1,557,281.86	£ 1,557,281.86	£ 1,557,281.86	£ 1,557,281.86	£ 1,557,281.86	£ 1,557,281.86	£ 1,557,281.86	£ 1,557,281.86	£ 1,557,281.86	£ 1,557,281.86
Cash Flow After Debt Service	£ 254,098.93	£ 312,155.33	£ 372,027.72	£ 433,772.07	£ 497,446.05	£ 563,109.10	£ 630,822.47	£ 700,649.26	£ 772,654.54	£ 846,905.32	£ 923,470.67

Amortization Schedule: An amortization schedule was created to analyze loan repayment structures.

		year	BOP Balance	Payment	Interest	Principal	Eop Balance
Equity	16,933,934.58						
Purchase Price	1,438,547.04	0					£ 19,029,741.42
Loan	19,029,741.42	1	£19,029,741.42	-£ 1,557,281.86	-£1,154,515.45	-£ 402,766.40	£ 18,626,975.01
Interest Rate	6%	2	£18,626,975.01	-£ 1,557,281.86	-£1,130,080.02	-£ 427,201.84	£ 18,199,773.17
Amortization Period	22.96	3	£18,199,773.17	-£ 1,557,281.86	-£1,104,162.11	-£ 453,119.75	£ 17,746,653.43
		4	£17,746,653.43	-£ 1,557,281.86	-£1,076,671.78	-£ 480,610.07	£ 17,266,043.35
		5	£17,266,043.35	-£ 1,557,281.86	-£1,047,513.65	-£ 509,768.21	£ 16,756,275.15
		6	£16,756,275.15	-£ 1,557,281.86	-£1,016,586.52	-£ 540,695.34	£ 16,215,579.81
		7	£16,215,579.81	-£ 1,557,281.86	-£ 983,783.07	-£ 573,498.78	£ 15,642,081.03
		8	£15,642,081.03	-£ 1,557,281.86	-£ 948,989.47	-£ 608,292.38	£ 15,033,788.64
		9	£15,033,788.64	-£ 1,557,281.86	-£ 912,084.98	-£ 645,196.88	£ 14,388,591.77
		10	£14,388,591.77	-£ 1,557,281.86	-£ 872,941.53	-£ 684,340.33	£ 13,704,251.44
		11	£13,704,251.44	-£ 1,557,281.86	-£ 831,423.28	-£ 725,858.57	£ 12,978,392.87
		12	£12,978,392.87	-£ 1,557,281.86	-£ 787,386.17	-£ 769,895.69	£ 12,208,497.18
		13	£12,208,497.18	-£ 1,557,281.86	-£ 740,677.36	-£ 816,604.49	£ 11,391,892.68
		14	£11,391,892.68	-£ 1,557,281.86	-£ 691,134.78	-£ 866,147.08	£ 10,525,745.61
		15	£10,525,745.61	-£ 1,557,281.86	-£ 638,586.50	-£ 918,695.36	£ 9,607,050.25
		16	£ 9,607,050.25	-£ 1,557,281.86	-£ 582,850.17	-£ 974,431.69	£ 8,632,618.56
		17	£ 8,632,618.56	-£ 1,557,281.86	-£ 523,732.37	-£ 1,033,549.49	£ 7,599,069.08
		18	£ 7,599,069.08	-£ 1,557,281.86	-£ 461,027.95	-£ 1,096,253.91	£ 6,502,815.17
		19	£ 6,502,815.17	-£ 1,557,281.86	-£ 394,519.32	-£ 1,162,762.54	£ 5,340,052.63
		20	£ 5,340,052.63	-£ 1,557,281.86	-£ 323,975.67	-£ 1,233,306.18	£ 4,106,746.45
		21	£ 4,106,746.45	-£ 1,557,281.86	-£ 249,152.22	-£ 1,308,129.64	£ 2,798,616.81
		22	£ 2,798,616.81	-£ 1,557,281.86	-£ 169,789.29	-£ 1,387,492.56	£ 1,411,124.25
		23	£ 1,411,124.25	-£ 1,557,281.86	-£ 85,611.50	-£ 1,471,670.35	£ 60,546.10

B. INDIVIDUAL PROPERTY ANALYSIS:

For individual property analysis, a similar structured approach is adopted, integrating a built-in function that facilitates seamless navigation between properties, ensuring swift and efficient.

Return analysis.- Return Analysis: Leveraged and unleveraged returns for each property are computed, with IRRs varying based on property characteristics.

Valuation and Sale: Similar to the portfolio analysis, NOI and sale price are determined for each property.

Cash Flow Analysis: Detailed cash flow projections are provided, incorporating potential gross revenue and operating expenses.

CONCLUSION

THE FINANCIAL MODELS DEVELOPED PROVIDE VALUABLE INSIGHTS INTO THE PERFORMANCE AND POTENTIAL OF THE real estate portfolio. By simulating various scenarios and analyzing individual properties, stakeholders can make informed decisions regarding investment strategies, financing options, and portfolio management. The models serve as powerful tools for optimizing returns and mitigating risks in the real estate market.

FUTURE CONSIDERATIONS

Future iterations of the model could incorporate additional factors such as market trends, macroeconomic indicators, and regulatory changes to enhance accuracy and predictive capability. Moreover, sensitivity analysis could be conducted to assess the impact of different variables on financial performance.

This project underscores the efficacy of utilizing advanced analytical tools and methodologies to drive value and inform decision-making in the real estate sector.