

**Problem Set 2 (Ch13, 14)**

1. The Donald Grump Corporation, a publicly-traded REIT, has expected total return to equity of 13%, average interest rate on their debt of 7.5%, and a Debt/Total Asset Value ratio of 40%. What is Grump's (firm-level) average cost of capital?

2. Consider a commercial (non-residential) property that costs \$1 Million with an initial before-tax yield of 8% (based on NOI), and an expected growth rate of 1% per year (in income and value). Ignoring capital improvements and selling expenses, develop a 10-year proforma for before-tax and after-tax property and equity cash flows. Assume a 40% income tax rate on ordinary income and 20% on capital gains, and financing of 70% of the property price with a 9% interest-only loan, and that land is worth 25% of the property value. Use the proforma to determine: (a) the ex ante before-tax IRR of the unlevered property investment; (b) the after-tax IRR of the unlevered property investment; (c) Compute the before-tax ex ante IRR of the levered investment in this property; and (d) the after-tax ex ante IRR of the levered equity in this property; and (e) the ratio of the AT/BT in the levered IRR, and note the difference between this ratio and the unlevered equivalent; (f) Do you think this is an argument for debt financing for this property investment for this investor? Why not?

[Hint: Note that this problem here is simplified from 14.11, leaving out the questions about PV(DTS), which you can skip. I strongly recommend that you use Excel or your favorite computer spreadsheet to do this problem. It will be much faster that way, and good practice for your computer spreadsheet skills.]

3. The table below presents recent survey information regarding what professional investors *state* is their typical expected total returns for "institutional" and "non-institutional" commercial property of various types and locations. (This is from Exhibit 11-6a, on page 130, discussed in section 11.2.5 of Chapter 11.) Let's ignore the fact that these expectations may be a bit exaggerated (as discussed in sections 11.2.3 and 11.2.4 on pp.127-129). Assuming a riskfree rate of 5% (short-term US T-bill yield in 1999), and based on the average across the types of properties in the table, how much more risk did investors in 1999 apparently perceive "non-institutional" property to be, as compared to "institutional" property? (That is, what is the ratio of the amount of risk in non-institutional property divided by that in institutional property?) In computing your answer, I suggest you copy/paste the data in the table below from the assignment Word file into Excel. This will be much quicker and less subject to error than doing the necessary computations by hand, even using a calculator.

Going-in IRR (Exhibit 11-6a):								
	Property Type:							
Prop. Quality:	Malls	Strip Ctrs	Indust.	Apts	CBD Office	Suburb.Off.	Hou.Off	SF Off
Institutional	11.14%	11.61%	11.14%	11.48%	11.28%	11.11%	11.78%	10.71%
Non-institutional	13.50%	14.20%	12.18%	13.01%	13.69%	12.73%	13.75%	12.46%

\*From Korpacz Investor Survey, First Quarter 1999

4. (a) Assuming riskless debt, if the loan/value ratio is 75%, approximately how much more risk will there be in the equity return than if the loan/value ratio were 50%? Put another way: If the return to equity can vary per year within a range of  $\pm 15\%$  with a 50% loan/value ratio, then within what range can it vary with an 75% loan/value ratio? (b) How much larger should the market's required risk premium be in the required return to equity with 75% debt as compared to 50% debt?

5. A certain real estate limited partnership (LP) advertises that it has a target of matching the stock market in total return for its limited partner investors, before-taxes. (Suppose that the stock market risk premium is expected to be 6%.) The conservative office and warehouse properties which the partnership plans to acquire typically command risk premia in their before-tax expected returns of about 3.5 percent.

Assuming riskless debt, what loan-to-value ratio must the LP plan to maintain in its property investments in order to have a good chance of meeting its stated target?

6. Answer the preceding question assuming the riskfree interest rate is 6% and the debt would have an interest rate of 8%.

7. (a) If the cap rate on a certain property is 9%, and loans are available at a mortgage constant of 10%, then approximately what is the expected income component of your before-tax return if you borrow 70% of the property price?

(b) What if you only borrow 60%?

8. Answer part (a) of the preceding question, only now with respect to the growth component of the equity return, assuming the loan interest rate is 10% and the expected total return on the property is 9.5%.

(b) What if the property cap rate were 10% instead of 9%?

9. The NOI is \$850,000, the debt service is \$600,000 of which \$550,000 is interest, the depreciation expense is \$350,000. What is the Before-tax Cash Flow to the equity investor (EBTCF) if there are no capital improvement expenditures or reversion items this period?

10. In the problem above, what is the after-tax cash flow to the equity investor if the income tax rate is 35%?

11. A non-residential commercial property which cost \$500,000 is considered to have 30 percent of its total value attributable to land. What is the annual depreciation expense chargeable against taxable income?

12. Consider an apartment property which costs \$400,000, of which \$300,000 is structure value (the rest is land). Suppose an investor expects to hold this property for 5 years and then sell it for at least what she paid for it (without putting any significant capital into the property). If the investor's marginal income tax rate is 39%, and the capital gains tax rate applicable to depreciation recapture is 25%, what is the present value, as of the time of purchase, of the depreciation tax shields obtained directly by this investor during the 5-year expected holding period (including the payback in the reversion)? Assume taxes are paid annually, with the first tax payment in one year from present, and assume that DTS for this investor are effectively riskless, and the investor's after-tax borrowing rate is 5%.