UNIWERSYTET EKONOMICZNY W KRAKOWIE

Lecture

Economic and financial evaluation

(part 1)

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Agenda

- Investment assessment - return and risk
- Simple techniques
- DCF based techniques

Investment assessment – selected methods

- **Simple methods:**
  - Pay-Back Period (PBP)
  - Rate of Return (ROI, ROE, CapRate)

- **DCF methods:**
  - Discounted Pay-Back Period (dPBP)
  - Net Present Value (NPV)
  - Internal Rate of Return (IRR)

1. PayBack Period (PBP)

- The **payback period** is the length of time that it takes for a project to recover its initial cost out of the cash receipts that it generates.

- **Payback rule:** If the calculated payback period is less than or equal to some pre-specified payback period, then accept the project. Otherwise reject it

PayBack Period (PBP)

$$PBP = \frac{I}{NOI}$$

I – Investment costs (aggregate)
NOI – net operating income (mean)

- Instead of NOI for basic calculation EGI (effective gross income) is sometimes used.

Weaknesses

2. Rate of Return

- A performance measure used to evaluate the efficiency of an investment

- A performance measure to compare the efficiency of different investments.

Rate of return

Method is used to compare returns on investment where the money gained or lost—or the money invested—are not easily compared using *monetary values*.

For example a 1,000 PLN investment that earns 70 PLN in interest obviously generates more cash than a 100 PLN investment that earns 30 PLN interest, but the 100 PLN investment earns a higher RATE OF RETURN

Rate of return (profitability)

$$ROI = \frac{PROFITS}{Investments\ costs}$$

$$ROE = \frac{PROFITS}{average\ total\ equity}$$

Everage rate of return

$$e.r.r. = [(1+r)^{1/n} - 1] * 100$$

Capitalization rate (cap rate)

$$CR = \frac{NOI}{I}$$

I – Investment costs (aggregate) – eg. Property acquistion
NOI – net operating income (mean)

- Instead of NOI for basic calculation EGI (effective gross income) is sometimes used.

Financial leverage effect

- How does leverage affect the EPS and ROE of a firm?
- When we increase the amount of debt financing, we increase the fixed interest expense

Financial leverage effect – an example

2 options:

A) The entire capital of the company is calculated as equity value 5 mln PLN

B) The company has 2 mln PLN equity and 3 mln PLN debt (bank loan, interest rate 10%)

Assuming that the annual revenue from the sale is 10 mln PLN while the costs (excluding interest on the loan) are 9,2 mln PLN,

please **calculate the return on equity (ROE)** for the two variants.

Solution

	A	B
EBIT		
-interest		
Earning after interst		
TAX (19 %)		
Earning after tax		
ROE		

Financial leverage effect

From a company's perspective, the use of financial leverage can positively - or sometimes negatively - impact its return on equity as a consequence of the increased level of risk.

Positive financial leverage

$$\frac{EBIT}{KW + KO} * 100\% > i$$

EBIT - Earnings Before Interest & Tax
KW – equity
KO – debt
i – loan interest rate

Change of ROE as a result of leverage

$$\sim r = \frac{KO}{KW} * \left(\frac{EBIT}{KW + KO} - \frac{i}{100} \right) * (1 - T) * 100$$

Leverage - keys no. 2

- Value of the property at the end of 2006 = 300,000 PLN
- The average monthly rent in 2007 = 1,200 PLN (interest = 700 PLN)
- Value of the property at the end of 2007 = 330,000 PLN

A) **What is the return on investment?**

a) Calculate rate of return generated by income?

b) Calculate rate of *return* generated by the *appreciation* of a property (capital appreciation)?

B) **How would change ROE if LTV = 50 %** (loan interest rate 6.5%, the monthly installment 1,118 PLN)?

Rate of return

- **Interpretation:**

principle of maximization of the rate

Analysis (Comparison)

- ✓**ROI_b –** average branch return
- ✓**WACC** - Weighted Average Cost of Capital

WACC

A firm has $2 mil of net debt and 100,000 of outstanding shares at $30 each. If they can borrow at 8% and the stockholders require 15% return what is the firm's WACC?

$$WACC = r_A = \left(\frac{D}{V} \times r_D\right) + \left(\frac{E}{V} \times r_E\right)$$

D – debt

V- total value

E – eqiuty

r- the firm's cost of eqity

NEXT LECTURE:

DCF based techniques

$$NPV = \sum_{t=0}^{n} \frac{CF_t}{(1+r)^t} - \sum_{t=0}^{m} \frac{I_t}{(1+r)^t} + \frac{RV}{(1+r)^n}$$

Literature

- *D. Geltner, N. Miller, Commercial Real Estate Analysis and Investments, South-Western Educational Pub; 2006 (2 edition)*

Part chapter

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Thank you for attention

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