Macroeconomics II

3. Discounted cash flow evaluation

BSc in Economics

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Discounted Cash Flow Evaluation

Useful formulas and definitions

- Future Value (1-period case):

$$FV = C_0 \times (1 + i)$$

where C_0 is cash flow today (time zero), and i is the appropriate interest rate.

- Present Value (1-period case):

$$PV = \frac{C_1}{1 + i}$$

where C_1 is cash flow at date 1, and i is the appropriate interest rate.

Discounted Cash Flow Evaluation

Useful formulas and definitions

- Future Value (multi-period case):

$$FV = C_0 \times (1 + i)^T$$

where C_0 is cash flow today (time zero), i is the appropriate interest rate and T is the number of periods over which the cash is invested.

- Present Value (multi-period case):

$$PV = \frac{C_1}{(1 + i)^T}$$

where C_T is cash flow at date T, and i is the appropriate interest rate.

Discounted Cash Flow Evaluation

Useful formulas and definitions

- Net Present Value: present value of the expected cash flows, less the cost of the investment.

$$NPV = PV - Cost$$

- Future Value of an investment compounded m times a year, for T years:

$$FV = C_0 \times \left(1 + \frac{i}{m}\right)^{m \times T}$$

- Effective Annual Rate (EAR) of interest: annual rate that gives the same end-of-investment wealth of the investment compounded m times a year, for T years.

Discounted Cash Flow Evaluation

Useful formulas and definitions

- Perpetuity: constant stream of cash flows that lasts forever

$$PV = \frac{C}{i}$$

- Growing Perpetuity: stream of cash flows that grows at a constant rate forever

$$PV = \frac{C}{i - g}$$

Discounted Cash Flow Evaluation

Useful formulas and definitions

- Annuity: stream of constant cash flows that lasts for a fixed number of periods

$$PV = \frac{C}{i}\left[1 - \frac{1}{(1+i)^T}\right]$$

- Growing Annuity: stream of cash flows that grows at a constant rate for a fixed number of periods

$$PV = \frac{C}{i}\left[1 - \left(\frac{1+g}{1+i}\right)^T\right]$$

Discounted Cash Flow Evaluation

Useful formulas and definitions

- Future Value with continuous compounding over many periods:

$$FV = C_0 \times \mathrm{e}^{iT}$$