5 Investitions-, Kurs und Rentabilitätsrechnung

Englische Aufgaben

5.1 A company considers the implementation of a new computer system with a useful economic life of six years. The buying price is 13 000€. Additionally, an annual license fee of 1200 € is incurred at the end of every year. The annual surplus is assumed to be 4500€ for the first three years, and 3200€ for the years four to six.

a. Compute the capital value of the investment considering a required rate of return of 4% p.a. and decide whether the investment is profitable.

b. Calculate the internal rate of interest for the investment.

[to be incurred … anfallen; to be due … fällig sein; useful economic life … Nutzungsdauer; license fee … Lizenzgebühr; surplus … Überschuss; investment … Investition; required rate of return … Kalkulationszinssatz; internal rate of interest … interner Zinssatz]

5.2 A company projects to buy a welding robot. Two offers are compared: the buying price for robot A is 45 000€, the assumed annual revenues are 10 000€. The cost for machine care is estimated with 1400€ per year, and after every three years additional maintenance costs of 4500€ arise. The useful economic life is expected to be 7 years, the declining value 9000€. Robot B is offered with a buying price of 39 000€, and a declining value of 7000€ after 6 years. The estimated annual revenues are 10000€, while the annual costs for machine care are 1700€. Additional maintenance costs of 11 000€ arise after four years.

a. Calculate the capital value for both investments for a required rate of return of 4.5%, and decide which one is more profitable economically.

b. The company plans to resell the robot after 4 years and estimates the price achievable for robot A with 22 000€. Calculate the reselling price required for robot B in order to derive the same capital value as for robot A after 4 years. Consider the same required rate of return as before.

[welding robot … Schweißroboter; revenue … Einnahmen; machine care … Wartung; maintainance costs … Reparaturkosten; declining value … Restwert; return flow … Rückfluss; to resell … weiterverkaufen]

5.3 The estimated surpluses over five years for a planned investment are listed in the table below.

a. Calculate the internal rate of interest.

b. Compute the modified internal rate of interest, assuming the return flows are invested at 3.5% p.a., and decide whether the investment is profitable.

year	return flows
0	− 37 000€
1	11 000€
2	11 000€
3	9 500€
4	9 500€
5	8 000€

[surplus … Überschuss; internal rate of interest … interner Zinssatz; modified internal rate of interest … modifizierter interner Zinssatz]

Remark: In the following examples we consider a 25% capital yields tax.

5.4 A bond with term of 8 years is issued at 97.5%. The nominal interest of the bond is 4.5%, coupons are paid annually, and the principal is 1400€.

a. Plot the payments of the bond.

b. Compute the yield of the bond **(i)** before, **(ii)** after capital yields tax.

[bond … Anleihe; to issue a bond … eine Anleihe emittieren; nominal interest … Nominalverzinsung; coupon … Kupon; principal … Nennwert; yield … Rendite; capital yields tax … Kapitalertragssteuer]

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5.5 Two corporate bonds of the companies A and B are offered with annual coupon payments. The principal is repaid at the end of the term. Compute the yield of both offers after capital yields tax. Decide, which offering is more profitable due to higher yield.

	company A	company B
nominal interest	3.75%	4.25%
maturity	9 years	11 years
issuing price	98.5%	100.5%

[corporate bond … Unternehmensanleihe; principal … Nennwert; term … Laufzeit; maturity … Laufzeit einer Anleihe; issuing price … Ausgabekurs]

5.6 A zero bond is issued to the following terms:
subscription price: 90%
face amount: 5500€
maturity: 7 years
redemption of the loan at the end of maturity at face amount.
Compute the yield of both offers **a.** before and **b.** after capital yields tax, if one subscribes for the loan on the day of issue.

[zero bond … Nullkuponanleihe; subscription price … Emissionskurs; face amount … Nennwert; maturity … Laufzeit; redemption of a loan … Tilgung einer Anleihe; to subscribe for a loan … eine Anleihe zeichnen; day of issue … Ausgabetag]

5.7 A zero bond is subscribed on March, 1st 2013 with an issuing price of 88.9%, and sold on December, 19th 2014 with C = 92.4%. Calculate the before tax yield resulting from this deal (consider 1 year = 360 days).
[before tax yield … Rendite vor (Kapitalertrags-)Steuer]

5.8 A bond with an 8 year maturity is issued with nominal interest of 3.85% and annual payments in arrears. The current market rate for low-risk assets is 3.5%.

a. Compute the fair issuing price for the bond.

b. Mr. Jones subscribes a bond with 2000€ principal at the beginning of the subscription period. Five years later the market rate is 3.75% and Mr. Jones sells the bond, right after receiving the fifth coupon.

I. Calculate the fair issuing price at which Mr. Jones may sell his bond.

II. Compute the yield Mr. Jones has made during the five years.

[market rate … Marktzinssatz; payment in arrears … nachschüssige Zahlung]

5.9 Mrs. Summers subscribes for a loan on the day of issue. The terms of the bond are:
subscription price: 98.5%,
face amount: 1000€,
nominal interest: 5%, annual coupons with payments in arrears,
maturity: 8 years,
redemption of the loan at the end of maturity at face amount.
After 3 years and 6 months Mrs. Summers resells the bond. The current market interest is 3.75%.

a. Calculate **i.** the clean price, **ii.** the dirty price of the bond at that time.

b. Calculate the yield Mrs. Summers realized during the 3 years and six months by the bond, considering Mrs. Summers' share at the fourth coupon.

[subscribe for a loan … eine Anleihe zeichnen; day of issue … Ausgabetag; term … Bedingung; redemption of a loan … Tilgung einer Anleihe; share … Anteil]