

Chpt4. TVM-Single Payments

Time Value of money *Individuals prefer to receive a dollar today to receiving that same dollar promised in a year's time.*

Interest *The cost of funds to a borrower or part of the return for a lender or investor*

Mortgage *recover money by selling property*

Term Loan *bank loan with maturity^{due date}*

4.1 Simple Interest & Future Value

Future Value *amount received later; cash value of investment at future date: $FV = P(1 + rn)$*

Simple Interest *Interest calculated on the original amount. $I = (P)(r)(n)$*

Money Markets *short-term debt markets: companies can borrow/ invest in the short-term.*

Formula $FV = P(1 + rn)$

4.2 Simple Interest & Present Value

Present Value *amount today: needed cash today, to yield a particular value at future.*

Discounts *to find the present value of future amount: inverse for compounding interest.*

Formula $PV = FV / (1 + rn)$

Working out/ Calculating how much the money we expect to receive in the future is worth today.

4.3 Compound Interest & FV

Compounded Interest *Interest is stacking: It is then added to the principal*

Compounding *Process of finding future amounts where interest is paid on interest already earned.*

Opportunity Cost *best market yield achieve through alternative course of action: Market Yield is often benchmarked for opportunity costs*

Formula $FV = PV(1 + r)^n$

Working out/ calculating future value through interest for each period (plus any interest), then added to the principal.

4.4 PV of a single payment

Discounting *The process of finding current amounts by the process of present value.*

Formula $PV = FV / (1 + r)^n$

Formula2 $PV = FV \times (1 + r)^{-n}$

4.5 Compounding frequency

Coupon *Interest paid, based on a percentage of a bond's face value.*

Zero-coupon Bond *single-payment: no interest payment during its lifetime since interest is included with the repayment of principal at maturity.*

Maturity *Deadline: The date when security will be paid.*

Formula $FV = PV \times (1 + r/m)^{m \times n}$

Formula2 $PV = FV / (1 + r/m)^{m \times n}$

When compounding period per year is increased by *semi-annually, quarterly, monthly or daily*.

PV formula can be used to calculate the current value of a zero-coupon bond.

4.6 Continuous compounding/ discounting

Formula $FV = PV(PV \times e^{r \times n})$

or $FV = PVe^{rn}$

When compounding frequency is increased to a very large number of (infinity).

Where e is constant, $e = 2.718$

4.7 Nominal & Effective Interest Rates

Nominal Rate *contractual rate, ignores compounding. includes inflation: quoted rate*

Effective Rate *actual rate, accounts compounding. includes adjustments: adjustments to nominal rate for the frequency of compounding.*

Annual Percentage Rate (APR) *contractual rate, ignores compounding. when short-term rates are annualized*

Rate of Return *rate of profit/ loss from investment*

Formula $r_e = (1 + r/m)^m - 1$

4.8 Unknown Interest Rate

Formula $r = (FV/PV)^{1/n} - 1$

FV and PV is given, but find interest rate.

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