

2/13/2020

Continuous compounding/Effective Rate  
Continuous compounding

$$A = Pe^{rt}$$

A is the amount in the account after compounding  
P is the principal  
 $e$  is a constant, approximately equal to 2.71828... EXP()  
 $r$  is the annual interest rate  
 $t$  is the time in years

Suppose you buy stocks worth \$10,000 and let the balance accumulate interest over time. The stock market increases at about 10% per year, compounded continuously. How much is the account worth after 20 years?

See excel

Effective Rate

The equivalent interest rate earned on a compounded interest account after one year  
Percent change

Suppose one account at Bank A earns 1.5% compounded monthly, and a second account at Bank B earns 1.3% compounded daily. Which account earns more interest? And what is the effective rate of each?

Formula for the effective rate: (time is always 1 year)

$$Rate_{effective} = \left(1 + \frac{r}{n}\right)^n - 1$$

More general formula:  $Rate_{eff} = \frac{P\left(1 + \frac{r}{n}\right)^n - P}{P}$

This is where the exam #1 material ends

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Data Analysis ToolPack (activate under Options)  
(can use for summary statistics)

Descriptive Statistics

Three classes:

Measures of center (average=mean, median, mode) ~typical

Measures of spread (standard deviation, variance, IQR=interquartile range=middle 50%)

Measures of position (percentile, quartile)

See Excel

Standard deviation and variance: always use the sample version; only use the population version when directly specified in the problem

Continue next class (two weeks) with weighted averages