

Compound Interest and the TVM Solver

Compound interest is when the interest earned is added to the original amount invested more frequently, and so you earn more interest.

- Note:** Annually = 1 time per year
Semi-annually = 2 times per year
Quarterly = 4 times per year
Bi-weekly = 26 times per year
Daily = 365 times per year

TVM SOLVER: You can use this program in a graphing calculator to calculate compound interest.

* To start press: APPS – Finance – TVM Solver

* Enter the following values

- N = total # of payments
 - I = annual interest rate (as a percent)
 - PV = present value
 - PMT = payment each period
 - FV = future value
 - PY = # of payments per year
 - CY # of compounding periods per year
- } Both are entered as negative values

BEGIN (Always use BEGIN for investments, and END for loans)

* To finish, highlight the wanted value and press: ALPHA - ENTER

Example 1: Calculate the future value when \$5000 is invested at 6.5% per annum (per year) compounded semi-annually for 8 years.

- N = 8
- I = 6.5
- PV = -5000
- PMT = 0
- FV = 8340.86
- PY = 1
- CY = 2
- BEGIN

Example 2: How long will it take \$3000 to double if it is invested at 4.5% p.a. (per annum) compounded monthly?

- N = 15.43 years
- I = 4.5
- PV = -3000
- PMT = 0
- FV = 6000
- PY = 1
- CY = 12
- BEGIN

Example 3: How much must be invested at 6.8% p.a. compounded quarterly in order to have \$10 000 after 5 years?

- N = 5
- I = 6.8
- PV = -7138.07
- PMT = 0
- FV = 10 000
- PY = 1
- CY = 4
- BEGIN

Compound Interest and the TVM Solver – Assignment

1. Use the TVM Solver to calculate the amount (Future Value) of the following investments:
- \$1000 invested at 6% per annum compounded semi-annually for 5 years.
 - \$ 800 invested at 4.8% per annum compounded semi-annually for 3 years.
 - \$ 600 invested at 8% per annum compounded quarterly for 3 years.
 - \$1200 invested at 6.8% per annum compounded quarterly for 10 years.
 - \$2500 invested at 12% per annum compounded monthly for 4 years.
 - \$10 000 invested at 5.4% per annum compounded monthly for 8 years.

a)	N =	FV =	b)	N =	FV =
	I =	PY =		I =	PY =
	PV =	CY =		PV =	CY =
	PMT =	BEGIN		PMT =	BEGIN
c)	N =	FV =	d)	N =	FV =
	I =	PY =		I =	PY =
	PV =	CY =		PV =	CY =
	PMT =	BEGIN		PMT =	BEGIN
e)	N =	FV =	f)	N =	FV =
	I =	PY =		I =	PY =
	PV =	CY =		PV =	CY =
	PMT =	BEGIN		PMT =	BEGIN

2. Use the TVM Solver to determine the following times. Answer in years.
- How long will it take an investment of \$1 000 to reach \$1 200 at 6.5% p.a. compounded monthly?
 - How long will it take for an investment of \$5 000 at 5.6% p.a. compounded quarterly to double in value?
 - How long will it take for an investment of \$10 000 at 9.5% p.a. compounded semi-annually to triple in value?
 - How long will it take for an investment of \$3 000 at 8.2% p.a. compounded annually to reach \$5000?

a)	N =	FV =	b)	N =	FV =
	I =	PY =		I =	PY =
	PV =	CY =		PV =	CY =
	PMT =	BEGIN		PMT =	BEGIN
c)	N =	FV =	d)	N =	FV =
	I =	PY =		I =	PY =
	PV =	CY =		PV =	CY =
	PMT =	BEGIN		PMT =	BEGIN

3. Use the TVM Solver to determine the original amount (Present Value) invested.
- How much must be invested at 3.5% p.a. compounded semi-annually in order to have \$5000 after 8 years?
 - How much must be invested at 4.1% p.a. compounded bi-weekly in order to have \$2000 after 3 years?

a)	N =	FV =	b)	N =	FV =
	I =	PY =		I =	PY =
	PV =	CY =		PV =	CY =
	PMT =	BEGIN		PMT =	BEGIN

Answers: 1. a) \$1343.92 b) \$922.34 c) \$760.95 d) \$2355.15 e) \$4030.57 f) \$15388.43
 2. a) 2.8 yrs b) 12.46 yrs c) 11.84 yrs d) 6.48 yrs
 3. a) \$3788.08 b) 1768.70