

How to Estimate How Long It Will Take to Double an Investment

There is an easy method for estimating how long it will take to double an investment. If “R” is the Rate of Interest per Annum (year), (8% would have R = 8, 6.25% would have R = 6.25), then the number of years for your investment to be doubled can be estimated using the “Rule of 70 (or 72)”, which is:

$$\text{Years} = \frac{70}{R}, \text{ or}$$

$$\text{Years} = \frac{72}{R}, \text{ (whichever is easier)}$$

Since, it is an estimate only, divide “R” into 70 or 72, whichever is easier. Here are some examples:

<u>Rate</u>	<u>Working</u>	<u>Length of time to Double (in years)</u>
14%	$\frac{70}{14} = 5$	Approximately 5 years
7%	$\frac{70}{7} = 10$	Approximately 10 years
5%	$\frac{70}{5} = 14$	Approximately 14 years
9%	$\frac{72}{9} = 8$	Approximately 8 years

You can see on the last one, I switched to a numerator of 72, since 9 went into 72 evenly, but not 70.

The formula to work out a more exact time it takes to double at 9% is as follows:

$$\text{Finish} = \text{Start} (1 + \text{Rate}/100)^{\text{Years}}, \text{ so we would have } 2 = 1 (1 + 9/100)^Y, \text{ or } 2 = 1.09^Y.$$

Solving this we get: $\text{Log}(2) = \text{Log}(1.09^Y)$, or $\text{Log}(2) = Y \text{Log}(1.09)$. This simplifies to:

$$Y = \frac{\text{Log}(2)}{\text{Log}(1.09)} = 8.043231727 \text{ years}, \text{ so you can see that our estimate above was not far off.}$$

Below is a spreadsheet comparing some estimates with actual answers. (Carries on to page two)

Rate (Percent)	Years To Double Investment		Actual Answer (Using logarithms)
	Using 70	Using 72	
4	17.5	18	17.67298769
5	14	14.4	14.20669908
6	11.66666667	12	11.89566105
7	10	10.28571429	10.24476835
8	8.75	9	9.006468342
9	7.777777778	8	8.043231727
10	7	7.2	7.272540897
11	6.363636364	6.545454545	6.641884618
12	5.833333333	6	6.116255374
13	5.384615385	5.538461538	5.671417169
14	5	5.142857143	5.290058556
15	4.666666667	4.8	4.959484455

16	4.375	4.5	4.670173539
17	4.117647059	4.235294118	4.414844778
18	3.888888889	4	4.187835134
19	3.684210526	3.789473684	3.984673773
20	3.5	3.6	3.801784017