

Excerpt from  
***Introduction to Real Estate Finance and Investment:  
Sample Problems, Student Edition, by Frank Gallinelli***

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## **Chapter 4: Present Value of a Future Cash Flow**

You can think of calculating Present Value (PV) as the reverse of the compound interest process. With compound interest you know the Present Value (i.e., the starting amount) and you know the periodic interest rate; you are trying to find what you would end up with – the Future Value (FV).

With this new calculation you still know the periodic rate but now you know the FV and want to figure out the PV instead.

As an investor, you have a very specific reason for wanting to make this calculation. Most investment returns, especially with real estate, do not arrive instantly. You may have to wait several years until you sell a property and realize a return. The longer you have to wait for a return, the less valuable it is because during that period of waiting you did not have the return in hand to put to work elsewhere. Money received in the future is less valuable than money received today. Hence, you use discounting to find the present worth (the PV) of a future return (the FV).

**Present Value = Future Value / [(1 + *i*)<sup>*n*</sup>]**, where *i* is the periodic discount rate and *n* is the number of periods

The formula can be cumbersome to use, but there are other ways you can make this calculation. One method is to use a table of Annual Present Value Factors, which we provide at <http://www.realdata.com/book>. If you use the table, your formula works as follows:

**Present Value = Factor from Table x Future Value**

Another way to get your answer is to use Microsoft Excel's built-in function, PV. The function looks like this:

**=PV(rate,nper,pmt,fv,type).**

**Rate** is the interest rate per period; **nper** is the number of periods; **pmt** is the amount of periodic payments, which we will not use here; **fv** is the Future Value; and **type** designates whether payments are made at the beginning or the end of periods. You don't need to use this last item, because the default is what you want here: end-of-period.

You will see both the PV table and the Excel methods demonstrated below.

**Problem 4-1:**

A friend promises to pay you \$7,000 four years from today. You figure that if he paid you the money today you could invest it at 3%. What is the value today of this promised \$7,000?

**Problem 4-2:**

You are thinking about buying a property that will yield \$85,000 cash proceeds upon sale ten years from today, but no income before then. You believe that alternative investment opportunities would give you 4.5% per year return on your money. What is the greatest amount of cash you would be willing to commit to this investment?