

# The Concept of Present Value

By Catherine Parente, CPA/ABV/CFF, CFE, CVA, MAFF

To understand present value, you must first understand “future value”.

If I gave you \$1,000 today and you invested that \$1,000 in an interest-bearing account earning 3%, then in one year’s time, the account would be worth \$1,030 – or in other words – the “future value” of that \$1,000 at 3% is \$1,030. **See Future Value Example.**

Now, let’s work backwards – if I gave you \$1,030 a year from now, what is the “present value” (i.e., today’s current value) of that \$1,030 at a 3% rate of return. That is easy, it is \$1,000. It is just the reverse of the future value – the calculation we just did. **See Present Value Example #1.**

Now, let’s make this more complicated – if I gave you only \$1,000 a year from now (not \$1,030), what is the present value (i.e., today’s value) of that \$1,000 at 3%? You might quickly say \$970 because \$970 plus \$30 of interest equals \$1,000. That is NOT correct! The correct answer is \$970.87. Why? Because if you calculate 3% of \$970.87 for one year, you get \$29.13. Adding the \$29.13 of interest to the \$970.87, you get \$1,000. **See Present Value Example #2.** Refer to the discussion of the calculation of this number in the next paragraph.

So, how does one calculate present value? With the wonders of Excel and other present value software, computers can do these calculations very easily. The formula for the present value calculation in Excel for the example we just did is = PV(.03,1,\$1000).

So, is that all there is to present value? Not exactly. There are many more variables that enter into the concept of present value. There is the concept of the rate of return to be used (also known as the discount rate), the concept of how many years (or periods if not a year) will a stream of money be received, the concept of the timing of the payments - will the money be received at the end of the year (or period) or sometime during a year (or period). There are other concepts, but these three have the most influence on the calculations and the resulting values.

For example, let’s change the rate of return (i.e., discount rate) to 6% from our previous example of 3%. Our present value of \$970.87 from **Present Value Example #2** now changes to \$943.40. **See Present Value Example #3.** It is critical in a litigation setting that an expert explains and justifies the use of an appropriate discount rate.

Now, let’s assume that we will get three payments of \$1,000 – one will be received a year from now, the second will be received two years from now and the third will be received three years from now. What is the present value (i.e., today’s value) of those three payments (i.e., the stream of payments). You can do three separate PV calculations for each of the three payments and then add them together. Thus, the present value of these three \$1,000 payments to be received each year for the next three years is \$2,673.02. **See Present Value Example #4.**

For our last variation, we will assume that the \$1,000 payment is not to be received at the end of the year, but instead will be received in the middle of the year. **See Present Value Example #5.** The present value result will be higher than **Present Value Example #2** because you have the money earlier and thus can invest it sooner and make more interest (i.e., return on your investment).

There are many more variations, but I wanted to lay out the more common concepts in present value calculations. It is important to note that although these numbers in these examples seem small, when applied to larger numbers, like hundreds of thousands of dollars or millions of dollars, the differences in these variables can be substantial.

# The Concept of Present Value

By Catherine Parente, CPA/ABV/CFF, CFE, CVA, MAFF

## Future Value Example

Today (Present Value)	\$	1,000.00
Rate of return		3%
A year from now (Future Value)	<u>\$</u>	<u>1,030.00</u>

## Present Value - Example #1

A year from now (Future Value)	\$	1,030.00
Rate of return		3%
Today (Present Value)	<u>\$</u>	<u>1,000.00</u>

## Present Value - Example #2

A year from now (Future Value)	\$	1,000.00
Rate of return		3%
Today (Present Value)	<u>\$</u>	<u>970.87</u>

## Present Value - Example #3

A year from now (Future Value)	\$	1,000.00
Rate of return		6%
Today (Present Value)	<u>\$</u>	<u>943.40</u>

## The Concept of Present Value

By Catherine Parente, CPA/ABV/CFF, CFE, CVA, MAFF

### Present Value - Example #4

A year from now (Future Value)	\$	1,000.00
Rate of return		6%
Today (Present Value)		<u><u>\$943.40</u></u>

Two years from now (Future Value)	\$	1,000.00
Rate of return		6%
Today (Present Value)		<u><u>\$890.00</u></u>

Three years from now (Future Value)	\$	1,000.00
Rate of return		6%
Today (Present Value)		<u><u>\$839.62</u></u>

### **Sum of the Present Values:**

Year 1 payment		\$943.40
Year 2 payment		890.00
Year 3 payment		839.62
	\$	<u><u>2,673.02</u></u>

### Present Value - Example #5

Six months from now (Future Value) ***	\$	1,000.00
Rate of return		3%
Today (Present Value)		<u><u>\$985.33</u></u>

\*\*\* - assumes that this payment is received in the middle of the year and not at the end of the year