

**CDX3** Preferred  
Stock  
income engine Investing.com

**SPECIAL REPORT**

**Doug K. Le Du**  
Teaches *YOU*



# Calculating Your Rate of Return

How TO do it and  
How NOT to do it

[PreferredStockInvesting.com](http://PreferredStockInvesting.com)

Doug K. Le Du, author of *Preferred Stock Investing*

---

## CDx3 Special Report: Calculating Your Rate Of Return

---

Company logos presented throughout this *CDx3 Special Report*, if any, are trademarks of the indicated companies.

---

Disclaimer: The content of this *CDx3 Special Report* is educational rather than advisory. This *CDx3 Special Report* explains aspects of making investment decisions. There can always be exceptions to the trends and generalizations presented here. The reader is responsible for considering the educational information presented here and making their own investment decisions in light of their personal financial resources and goals.

---

Version 2.01

## **ACKNOWLEDGEMENTS**

I would like to thank Dr. Catherine Finger, a university accounting professor, for her contributions my book, *Preferred Stock Investing*, and to this CDx3 Special Report. While any remaining calculation errors are solely mine, Dr. Finger was always willing to lend the critical eye of a university accounting professor to my calculations and I am deeply grateful.

I would also like to thank Mr. Karel Podolsky, a corporate finance instructor. Working through the syntax of the Microsoft Excel worksheet functions used throughout *Preferred Stock Investing* and presented within this CDx3 Special Report was a tedious affair and Mr. Podolsky toiled for many hours to be certain that I was implementing Dr. Finger's formulas properly.

I am indebted to you both.

## **CALCULATING YOUR RATE OF RETURN**

### **How To Do It, And How Not To Do It**

When one undertakes to write an investing book, the intricacies of annual rate of return calculations are a constant companion. University accounting professors will tell you (as one did with me) that calculating and presenting the annual rate of return on a preferred stock investment really gets down to what it is you want to know and how precisely you want to know it.

I wanted to provide some level of detail regarding how I approached making these calculations for *Preferred Stock Investing*, not only so that you can understand how I came up with my numbers but, more importantly, to help you calculate your annual rates of return as you build your own CDx3 Portfolio.

The three most common rate of return calculations used by preferred stock investors are Current Yield (CY), Yield-To-Call (YTC) and Effective Annual Return (EAR).

Our Preferred Stock List™ database program allows subscribers to see CY, YTC and EAR for every preferred stock and Exchange-Traded Debt Security (ETDs) in our database.

So let's take a look at these three popular rate of return calculations and what they mean for preferred stock investors.

#### ***Current Yield (CY)***

CY is the “Yield” metric that you see whenever you view an online quote for a dividend-paying security, including dividend-paying common stocks and preferred stocks.

The CY calculation assumes that you never sell your shares, and the issuing company never redeems them either; you hold your shares and collect the dividend income forever (no capital gain or loss is ever realized).

CY measures the annual rate of return of your dividends, given the amount you are investing (your purchase price). Here is the formula for CY:

$$CY = ( [\text{dividend rate}] \text{ times } [\text{par value}] ) \text{ divided by } [\text{purchase price}]$$

For example, if you purchase an 8 percent preferred stock that has a \$25 par value, you are going to make \$2.00 per year in dividend income (8% of \$25). In order to make that \$2.00 dividend, you need to invest, say, \$26 per share (today's market price).

Filling in the formula:

$$CY = ( [8.00\%] \text{ times } [\$25] ) \text{ divided by } [\$26.00]$$

$$CY = ( \$2.00 ) \text{ divided by } \$26.00$$

$$CY = 7.69\%$$

In this example, you have to invest \$26 in order to make \$2.00 per year in dividend income so your annual Current Yield is 7.69 percent on the money you've invested.

Notice that while informing you about the annual rate of return on your dividend income, the Current Yield formula does not make any statement whatsoever about any gain or loss you may realize when you sell your shares (notice that your sell date and sell price are not included in the formula for CY).

Nor does CY account for any additional gains you might realize if you reinvested your dividend cash. The CY value assumes that the dividends you receive provide no value to you whatsoever (you drop the checks in the nearest shredder).

Current Yield makes a statement about the rate of return on your dividend income *only* and assumes that you own the shares forever.

### ***Yield-To-Call (YTC)***

YTC and EAR are more comprehensive metrics than CY because they not only include the rate of return on your dividend income, but they also account for any capital gain or loss you realize when you sell your shares. Further, YTC and EAR assume that each dividend payment that you receive is reinvested in something that provides value to you whether you buy more shares or spend the cash.

The thinking goes that once the dividend is received, the investor will put that cash toward the alternative that provides the highest value, whether or not that value comes in the form of additional dividend income (as with reinvesting the dividend) or continued life (as with using the dividend cash to purchase

## CDx3 Special Report: Calculating Your Rate Of Return

---

groceries). If the investor chooses to buy groceries over reinvesting at, say, 8 percent then continued life must have a value of at least 8 percent to the investor.

So the YTC and EAR values properly reflect the return to the investor regardless of how the investor chooses to realize the value of their dividends (more shares or more groceries).

By using the par value as the sell price and the call date as the sell date, the YTC formula provides your annual rate of return in the event your shares are redeemed (called) by the issuing company on the published call date (hence the name Yield-To-Call). The same formula is also used to calculate “Yield-To-Maturity” by simply plugging in the maturity date of your preferred stock (if it has one), rather than the call date.

In fact, the same YTC formula works for any future expected sell price and expected sell date.

To calculate the value earned by reinvesting your dividends, the YTC calculation performs what is called “discrete compounding” (as opposed to the “continuous compounding” that the EAR formula uses; more on this in a moment).

The total return on your investment is represented graphically by the area under a curve that extends over time. Integral calculus is needed to calculate that area but since computers cannot perform the required calculus, the area is estimated by the YTC and EAR formulas by dividing the area into a bunch of rectangles then adding up the area of each rectangle; the more rectangles that are used in the calculation, the more accurate the result will be.

And that is the difference between YTC and EAR; otherwise, the calculations are the same. But as you’ll see in a moment, this is a critically important difference.

The number of rectangles that are used by the YTC calculation is pegged to the dividend payment frequency (very specific, discrete periods in time), so there are relatively few rectangles used to estimate your actual return (the area under the total return curve). While using this discrete compounding makes the calculation easier (especially back in the days when this was done using a piece of paper and a stubby pencil), it produces a less accurate result than a calculation that uses many more rectangles (e.g. EAR, discussed next).

You can read more about the discrete compounding used by the YTC calculation here: <http://financetrain.com/topic/discretely-compounded-rate-return/>

Calculating YTC is a two-step process. The rate of return for a dividend period (e.g. quarter) is calculated first, then that result is multiplied by the number of dividend periods in a year (discrete compounding periods).

Financial calculators and automated math functions have, fortunately, made performing such calculations much easier. The RATE function that is provided with Microsoft's Excel spreadsheet (and similar programs) calculates the rate of return for a dividend period very easily and looks like this:

$$r = \text{RATE}([ \text{divs left} ], [ \text{div amount} ], -[ \text{purchase price} ], [ \text{par value} ])$$

where,

[divs left] is the number of dividends remaining between the purchase date (today) and the sell date (call date);

[div amount] is the amount of the periodic (e.g. quarterly) dividend payment that you receive;

-[purchase price], expressed as a negative number to reflect cash spent, is the price you pay for your shares (e.g. last trade price); and

[par value] is the par value (also referred to as the liquid price or redemption value) of your security (e.g. \$25.00).

The result,  $r$ , is the rate of return per dividend period (e.g. quarter). Multiplying  $r$  by the number of dividend periods per year provides the annualized YTC value.

Let's return to the same example we saw earlier for Current Yield and assume that the 8 percent preferred stock described there has a February 15, 2017 call date (and that today's date is September 22, 2014):

$$r = \text{RATE}(9.61, 0.50, -26.00, 25.00)$$

$$r = 1.549\%$$

$$\text{YTC} = 1.549\% \times 4$$

$$\text{YTC} = 6.20\%$$

In this example, you are going to receive 9.61 dividend payments between today (September 22, 2014) and February 15, 2017 (the call date). Leaving the fractional amount on this value is intentional and allows the calculation to be more accurate, given the partial final dividend that is typical when a preferred stock is redeemed.

Notice how the YTC value of 6.20 percent is less than the security's 8 percent coupon rate, hence taking into account the capital loss you will realize with this example (you paid \$26, but will only receive \$25 from the issuing company at redemption, realizing a \$1 per share capital loss).

Now let's take a look at an even more accurate rate of return calculation for your preferred stock investment – Effective Annual Return.

### ***Effective Annual Return (EAR)***

As with YTC, EAR is a more comprehensive metric than CY and for the same reason – EAR takes into account not just the return on your dividend income, but any capital gain or loss you realize upon sale plus the value of reinvested dividends (more shares or more groceries).

As mentioned earlier, EAR is more accurate for preferred stocks since it estimates the area under the total return curve by using many more rectangles to get closer to the real answer.

As with YTC, calculating EAR is a two-step process, the first step being the same as YTC's first step – calculating 'r', the rate of return for a single dividend period. Here is Excel's RATE function for 'r' again:

$$r = \text{RATE}(\text{[divs left]}, \text{[div amount]}, -\text{[purchase price]}, \text{[par value]})$$

To perform continuous compounding (lots of rectangles) of the return from a single dividend period, EAR uses the following compounding formula:

$$\text{EAR} = \{ (1 + r)^{\text{[divs per year]}} \} - 1$$

where,

r is the value from the RATE function;

^ indicates “raised to the power of”; and

[divs per year] indicates how many dividends are paid per year.

Read more about the continuous compounding used by the EAR calculation here:  
<http://financetrain.com/topic/continuously-compounded-rate-return/>

Returning to our earlier example, the r value for a quarter was 1.549 percent. Now watch what happens as we plug this value into the continuous compounding of the EAR formula:

$$\text{EAR} = \{ (1 + 1.549\%) ^ 4 \} - 1$$
$$\text{EAR} = 6.34\%$$

Notice how the EAR value of 6.34 percent is higher than the YTC value of 6.20 percent. Because EAR uses continuous compounding (many more rectangles), the result provided by the EAR calculation will always be more accurate (and higher) since it captures more of the area under the total return curve than the discrete compounding used by the YTC formula (far fewer rectangles).

### ***How Not to Do It***

If you look over the financial functions of a financial calculator or electronic spreadsheet program (Excel or OpenOffice), you will see many more than those I have presented here. Each of these functions is used for very specific purposes and each have a variety of built-in assumptions.

While it may be tempting to use one of these other functions to calculate the rate of return for a preferred stock investment, be very careful about straying off of the CY/YTC/EAR path.

For example, Microsoft's description of Excel's YIELD function states that this function "Returns the yield on a security that pays periodic interest." And, as you'll see in a moment, the YIELD function takes capital gains/losses into account and also assumes reinvested dividends (compounding). Sounds like just what we are looking for, right?

But this is where the rate of return functions frequently used for bonds (such as the YIELD function) do not apply to preferred stocks. Watch what happens.

The Excel YIELD function has seven parameters. Here is how Excel's Help system presents the syntax of the YIELD worksheet function:

YIELD( settlement, maturity, rate, pr, redemption, frequency, basis)

Allow me to translate:

YIELD( [purchase date], [sell date], [dividend rate], [purchase price], [sell price], [pmts per year], 0 )

## CDx3 Special Report: Calculating Your Rate Of Return

---

Plugging in some sample values, the function would look like this:

```
=YIELD(date(1997,1,1), date(2006,12,31), 8%, 100.00, 150.00, 1, 0)
```

Follow along in the formula: You purchased this dividend-paying stock on January 1, 1997 and sold it ten years later on December 31, 2006. It pays an 8% annual dividend. You paid \$100 for it originally, and you sold it for \$150. Dividends are paid 1 time per year at the end of the year.

The zero at the end tells Excel to use 30 day months and a 360 day year (12 months of 30 days each).

The above Excel YIELD function calculates an annual rate of return for this investment of 10.99%.

Now watch what happens when we use Excel's YIELD function for a preferred stock (paying quarterly, rather than annual, dividends).

As we saw with the YTC versus EAR calculations, when you receive dividends from an investment more frequently (more frequent compounding), your annual rate of return is higher than if you receive those dividends less frequently. The more frequent the dividend payments the higher the rate of return.

The result from our annual dividend example above was 10.99%. If we modify the above YIELD function to account for quarterly, rather than annual, dividend payments, we would expect a higher rate of return to result from this Excel function.

Here is the Excel YIELD function assuming quarterly, rather than annual, dividend payments for the same ten year investment (note that the [pmts per year] parameter is now set to a 4):

```
=YIELD(date(1997,1,1), date(2006,12,31), 8%, 100.00, 150.00, 4, 0)
```

This YIELD function, using quarterly dividends, produces a result of 10.83%. That is *lower*, not higher as we would have expected, than the same YIELD function for the same investment with annual dividends.

While using the YIELD function seems appealing given its description, applying it to a preferred stock investment would produce an incorrect result since this function's built in assumptions are specific to the structure of bonds.

There are a multitude of return calculations, each of which makes differing assumptions about your investment. While each calculation has its strengths and weaknesses, it is important to understand which ones are applicable to a preferred stock investment and which are not.

If you plan on holding your preferred stock shares indefinitely and do not believe that the issuing company is likely to ever redeem your shares (as can be the case with preferred stocks that offer a very low dividend rate), Current Yield will accurately reflect the annual rate of return of your dividend income.

But if you plan on reinvesting your dividends and/or realizing a capital gain or loss downstream, EAR is the most accurate since it uses continuous compounding (more rectangles to estimate the area under the total return curve), rather than the discrete compounding (fewer rectangles) used by the YTC calculation.