How to calculate Required Rate of Return (RRR)

The required rate of return (RRR) is a component in many of the metrics used in corporate finance and equity valuation. The required rate of return is how much profit is needed in order to go forward with a project or an investment. The RRR can be used to help investors decide whether they should proceed in buying a security. However, corporate executives and financial professionals calculate the RRR for projects including purchases of manufacturing equipment and potential mergers and acquisitions.

The required rate of return goes beyond merely identifying the return from an the investment, and instead, factors in risk as one of the key considerations to determining the potential return. The required rate of return also sets the minimum return an investor should accept, given all other options available and the capital structure of the company. To calculate the required rate, you must look at factors such as the return of the market as a whole, the rate you could get if you took on no risk (the risk-free rate of return), and the volatility of the stock or the overall cost of funding the project. Here we examine this metric in detail and show you how to use it to calculate the potential returns on your investments. (For background reading, check out "FYI on ROI: A Guide to Return on Investment.")

Discounting Models

One particularly important use of the required rate of return is in discounting most types of cash flow models and some relative value techniques. Discounting different types of cash flow will use slightly different rates with the same intention – finding the net present value.

Common uses of the required rate of return include:

- Calculating the present value of dividend income for the purpose of evaluating stock prices
- Calculating the present value of free cash flow to equity
- Calculating the present value of operating free cash flow

Equity, debt, and corporate expansion decisions are made by placing a value on the periodic cash received and measuring it against the cash paid. The goal is to receive more than what you paid. In corporate finance, the focus is on the cost of funding projects compared to the return. In equity investing, the focus is on the return compared to the risk taken on.

Equity and Debt

In equity investing, the required rate of return is used in various calculations. For example, the dividend discount model uses the RRR to discount the periodic payments and calculate the value of the stock. Finding the required rate of return can be done by using the *Capital Asset Pricing Model* (CAPM).

The CAPM will require that you find certain inputs:

a) The risk-free rate (RFR)
b) The stock's beta
c) The expected market return

Start with an estimate of the risk-free rate. You could use the current yield to maturity of a 10 year T-bill – let's say it's 4%. Next, take the expected market risk premium for the stock which can have a wide range of estimates. For example, it could range between 3% to 9%, based on factors such as business risk, liquidity risk, and financial risk. Or, you can derive it from historical yearly market returns. For illustrative purposes, we'll use 6%, rather than any of the extreme values. Often, the market return will be estimated by a brokerage firm, and you can subtract the risk-free rate.

Lastly, you can use the beta β of the stock. To calculate beta manually, use the following regression model:

$$\text{Return of Stock} = \alpha + \beta_{\text{stock}} * R_{\text{market}}$$

Where:

- β stock is the beta coefficient for the stock, meaning it is the covariance between the stock and the market divided by the variance of the market. We will assume the beta is 1.25.
- R_{market} is the return expected from the market. For example, the return of the S&P 500 can be used for all stocks trading on it – and even somestocks not on the index, but related to businesses that are.
- α shown as α is a constant that measures excess return for given level of risk

Now we put together these three numbers using the Capital Asset Pricing Model:

$$E(R) = RFR + \beta \text{ stock } (R_{\text{market}} - RFR)$$

$$E(R) = 0.04 + 1.25\ (6)$$

$$E(R) = 11.5\%$$

Where:

E(R) = the required rate of return, or expected return
RFR = the risk-free rate
β stock = beta of the stock
Rmarket = return of the market as a whole
(Rmarket – RFR) = the market risk premium, or the return above the risk-free rate to accommodate additional unsystematic risk

Dividend Discount Approach

An investor could also use the dividend-discount model, also known as the Gordon growth model. By finding the current stock price, the dividend payment and an estimate of the growth rate for dividends, you can rearrange the formula into:

$$k=(D/S)+g$$

Where:

k = required rate of return
D = dividend payment (expected to be paid next year)
S = current stock value (if using the cost of newly issued common stock you will need to minus the flotation costs)
g = growth rate of the dividend

Again, it is important to note that there needs to be some assumptions, particularly the continued growth of the dividend at a constant rate.
Required Rate of Return in Corporate Finance

Investment decisions are not limited to stocks; every time money is invested in an expansion or a marketing campaign an analyst can look at the minimum return these expenditures demand for the risk taken.

If a current project provides a lower return than other potential projects, the project will not go forward. Many factors go into the decisions as to whether to go ahead with a project including risk, time horizon, and available resources, but the required rate of return is typically the core reason for deciding between multiple investments.

In corporate finance, when looking at an investment decision, the overall required rate of return will be the weighted average cost of capital (WACC). To learn more about this metric, please read Investors Need A Good WACC.
Capital Structure

The **WACC** is the cost of financing new projects based on how a company is structured. If a company is 100% debt financed, then you would use the interest on the issued debt and adjust for taxes, since interest is tax deductible, to determine the cost. In reality, a corporation is much more complex. Finding the true cost of capital requires a calculation based on a combination of sources. Some would even argue that, under certain assumptions, the capital structure is irrelevant, as outlined in the Modigliani-Miller theorem.

To calculate the WACC take the weight of the source of financing and multiply it by the corresponding cost. There is one exception, however: multiply the debt portion by one minus the tax rate and sum the totals. The equation is as follows:

$$WACC = Wd\,[kd(1-t)] + Wps(kps) + Wce(kce)$$

Where:

WACC = weighted average cost of capital (firm-wide required rate of return)
Wd = weight of debt
kd = cost of debt financing
t = tax rate
Wps = weight of preferred shares
kps = cost of preferred shares
Wce = weight of common equity
kce = cost of common equity

When dealing with internal corporate decisions to expand or take on new projects, the required rate of return is used as a minimum acceptable return benchmark – given the cost and returns of other available investment opportunities. For more on this topic, please read "Evaluating a Company's Capital Structure."

The Bottom Line

The required rate of return is a difficult metric to pinpoint due to the various estimates and preferences from one decision maker to the next. The risk-return preferences, inflation expectations, and the firm's capital structure all play a role in determining the required rate. Each one of these and other factors can have major effects on an asset's intrinsic value. As with many things, practice makes perfect. As you refine your preferences and dial in estimates, your investment decisions become dramatically more predictable.