Calculating Investment Returns

Remick Capital, LLC

Calculating Returns – Critically Important

- When you invest or save your money, the end goal is to generate a good return on your funds. What defines 'good' will be a complex discussion based on risks, goals, expectations, and the overall investment strategy…
- However, regardless of what your definition of 'good' is, you must be sure to accurately measure what your returns are in a way that is understandable to you, and (most importantly) is comparable with whatever alternatives are available to you.

Opportunity Cost:

- Every single decision you make with your money entails an opportunity cost that must be understood.
  - If you choose to forgo a purchase to put your money in the bank, or if you invest in your 401(k) instead of paying off a car loan, your financial decisions have a 'cost' based on whatever activity you chose not to participate in.
- Smart money management (and investing) requires a constant recognition of your opportunity costs so you maximize the use of your financial resources.

Always keep opportunity costs in mind during financial decisions

Measuring Investment Returns: Simple Right?

- While many people think they understand how to calculate investment returns, they generally do not.
- More importantly, the returns people most often ascribe to their investments are not just incorrect, they are in fact misleading and can drive poor decisions.

Simple Example:

- You have an investment opportunity with the following terms:
  - You must invest $10,000 on Jan 1st, and another $20,000 on June 1st.
  - You received back $32,000 on October 1st of the same year.
- **What is your return?**

Measuring Investment Returns: Simple Right?

- While many people think they understand how to calculate investment returns, they generally do not.
- More importantly, the returns people most often ascribe to their investments are not just incorrect, they are in fact misleading and can drive poor decisions.

Simple Example:

- You have an investment opportunity with the following terms:
  - You must invest $10,000 on Jan 1st, and another $20,000 on June 1st.
  - You received back $32,000 on October 1st of the same year.
- **What is your return?**
  - **A) 6.67%** — **Correct → This is your 'simple return'.**
  - **B) 14.56%** — **Correct → This is your 'Internal Rate of Return' (IRR).**
  - **C) 10.70%** — **Correct → This is usually called your 'personal rate of return'.**
  - **D) $2,000** — **Correct → This is raw profit in dollars your investment generated.**

That's great… but which one is the *right* return?

'Simple' Return Overview

A) 6.67% = 'Simple' return = 1 - (Total Amount Received / Total Amount Invested)

- While many people intuitively understand the 'simple' return calculation, it is possibly the most useless and misleading way to think about returns.

Problems with 'Simple' return calculations:

- Very simply, the simple return calculation does not take into account ***time***… which is the single most important thing you need to do to compare your opportunity costs.
  - If you have two $10k investment options that will generate $5k in profit, but one will do so over 2 years, and the other will do so over 10 years, using a 'simple' return calculation will not capture the difference
  - This makes 'simple' returns easy to calculate but useless for any real life application, especially factoring in your opportunity cost(s).

'Simple' return calculation may seem intuitive but it does not capture the inherent time value of money.

Internal Rate of Return (IRR) Overview

B) 14.56% = Internal Rate of Return (IRR)

- IRR is the "effective ***annualized*** interest return" of a ***series*** of investment cash flows.
  - This sounds complicated, but it is really just the ***annualized*** rate of return of an investment.
  - The key part of IRR is that it is 'annual', meaning that the return is a % over a yearly interval of time.
  - The IRR calculation also can make sense of investments that have multiple cash inflows and outflows. The math to calculate IRR must be done by a computer however.
- IRR can seem non-intuitive (especially when measuring investments shorter than one year), but it is probably the most important type of return to understand when thinking about investments and opportunity costs.
  - An investment generating a 1% return in a one month period will have an IRR of ~12.50%.
  - An investment generating a 10% return in a month, will have an IRR above 200%.
- Using IRR can help make investment returns (greater than one year in length) comparable, but it needs to be used with understanding of what it means.

Using Internal Rate of Return (IRR) to measure your investment performance is good for comparing investment results on an annual timeframe.

However, using IRR for short time frames can be misleading.

Internal Rate of Return (IRR) Overview

C) 10.70% = Personal Rate of Return

- Personal Rate of Return is the same as IRR with one simple difference: It is the return that is implied by a series of investment cash flows but expressed over the timeframe of the investment (not annually).
  - So while an investment that returned 10% annually for 3 years would have an IRR of 10%, it would have a Personal Rate of Return of ~33.1%.
  - This equation is nice because many retirement and brokerage accounts calculate it, and it takes into account the fact that money is added into the account over time.
- Personal Rate of Return has some advantages and disadvantages:
  - It keeps track of multiple cash inflows and outflows as part of it's calculation
  - Financials institutions use this rate because individuals like to see 'higher' return numbers as time goes by, and personal rate of return accurately reflects this
  - It however does not lend itself to comparisons to opportunity cost because the timeframe is still arbitrary (not standardized as an 'annual' rate like IRR).

Personal Rate of Return is useful for calculating an investment that involves a series of inflows and outflows of cash over time. It does not however make returns comparable to other investments or costs that are almost always expressed on an annualized basis.

Internal Rate of Return (IRR) Overview

D) $2,000 = Raw profit in dollars

- Measuring your raw profit on an investment is very satisfying, and has inherent value. It is also the most simple calculation.
  - However, when investing the following questions are critical, and unanswered by measuring returns in raw dollars:
    - How much money is required?
    - How long will it take?
  - If I told you I had an investment that I could guarantee would make you $2,000, you may be excited, but if I then told you that it would take 50 years and $10,000 to get that return, you may not be so impressed.
- Raw profit is intuitive, but only as useful as 'simple' return.

Examples – Why you should care?

- Suppose you have two alternatives for your savings:
  - Invest in a savings account that makes 12% APY (Annual Percentage Yield)
    - This is a very high savings rate, just stay with me here…
  - Your company offers you a short term savings option where you can defer each dollar of your paycheck for a six month period, and get $1.08 back at the end of the six months.
- ***Which do you choose, and why?***
  - This question is hard because the options aren't directly comparable.
- How to solve?
  - A 12% APY savings account will turn $1.00 into $1.12 in 12 months. So what would it do in six months? → It would make about $1.06.
  - The second choice above will make 8% on the first paycheck contribution which is held for 6 months, but it will also make 8% on the ***last*** paycheck contribution which is held for only maybe 2 weeks.
    - That same two week period will only make a fraction of a penny in the savings account.

The first option will generate an IRR on your money of about 12%.
The second option will generate an IRR of over 30%. While you *only* make 8% 'simple' interest, the time you must to invest your money is short, so your annualized return is high

Examples – continued…

- While the example on the previous page may seem contrived, it is not.
  - Many companies have stock participation plans in which participants may contribute money to buy the company stock at a discount of 10-20%.
  - The plans range from 6-18 months generally and often provide the option for the participant to immediately sell the stock right after purchase.
    - Hence, you do not have to take risk on holding the stock
  - These plans (in most cases) represent an opportunity to make guaranteed annualized returns of much greater than 30% with nearly zero risk (assuming you sell automatically).
  - Shockingly, most of these plans have participation rates of less than 70% due to incorrect understanding of the real returns and risks.

Investing is about finding the most optimal return available for your money. Understanding the concept of annualized return is critical to being able to make trade offs by comparing your alternatives.

Things to Keep in Mind

- When determining your return, or making a forecast, there are many important factors:
  - Inflation, Taxes, Risks are all important
  - Opportunity costs are just one aspect of successful investing
  - While saying that an investment that returns 8% annually is better than one that return 4% is axiomatic, it is also an oversimplification of discussion.
- The key thing that I would like people to understand:
  - If you have a $10,000 401(k) balance on January '09, and then you have a $13,000 balance the following year, you did not necessarily do well.
  - If you contributed $4,000 to your 401(k) over the year, that $3,000 increase is nothing to be proud of.
  - Internal Rate of Return (IRR) calculations compensate for this inflow of cash into your account and would show that your real return was approximately -8%.
  - Over time frames different than 12 months, IRR calculations adjust for the time to present all numbers in an annual time frame for comparison.
  - Calculating IRR by hand is not possible, but Excel has a function "XIRR" that can do it.