



5 Metrics Every Real Estate Investor Needs to Know

DCF, PV, NPV,
PI, IRR

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DCF, PV, NPV, PI, IRR – It may seem like a witch's brew of random letters, but truly, it's just real estate investing. You can handle it. Any or all of these measures can be useful to you, if you understand what they mean and how to use them.

DCF – Discounted Cash Flow

You've heard of the "Time Value of Money." It's a notion that's fundamental to every kind of investment, not just real estate. In fact it should be part of how you think about money all the time. In short, it tells you that money received in the future is less valuable than money received now. The reason: If you get the money later, you lose the ability to invest it to earn more. This "time value" is at the heart of Discounted Cash Flow analysis.

It may sound complicated, but Discounted Cash Flow is a pretty straightforward undertaking. You project the cash flows that you think your investment property will achieve over the next 5, 10, even 20 years. (Don't forget to include the one big cash flow you get at the end when you sell the property).

Then you pause to remind yourself that money received in the future is less valuable than money received in the present.

So, you discount each of those future cash flows at a rate equal to the "opportunity cost" of your capital investment. The opportunity cost is the rate you might have earned on your money if you didn't spend it to buy this particular property, but invested it elsewhere. When you discount each cash flow, you're finding its "present value." The process of doing this with all of the cash flows is called, not surprisingly, "Discounted Cash Flow analysis."

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PV – Present Value

Consider this example, where you invest \$300,000 in cash to earn the following cash flows:

Year 1 Cash Flow:	10,000
Year 2 Cash Flow:	20,000
Year 3 Cash Flow:	25,000
Year 4 Cash Flow:	30,000
Year 5 Cash Flow:	385,000 (includes the proceeds of sale)

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If you discount each of these cash flows at 10%, then add up their discounted values, you'll get 303,948:

Year 1, Discounted:	9,091
Year 2, Discounted:	16,529
Year 3, Discounted:	18,783
Year 4, Discounted:	20,490
Year 5, Discounted:	239,055
Total PV of Cash Flows:	303,948

Now you have the Present Value of all the future cash flows. This is the value, in present dollars, of the entire income stream that you expect to receive from the property.

So... how does this Present Value of the income stream compare to what you paid to get it? That's where NPV comes in.

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NPV – Net Present Value

You had a different kind of cash flow when you initially purchased the property (call that Day 1 or Year 0) – a cash outflow of \$300,000, your initial investment. To get the *Net Present Value*, you find the difference between the discounted value of the future cash flows -- 303,948 -- and what you paid to get those cash flows -- 300,000.

NPV = PV of future Cash Flows less Initial Investment

NPV = 303,948 – 300,000 = 3,948

What does that mean to you as an investor? If the NPV is positive, it suggests that the investment may be a good one. That's because a positive NPV means the property's rate of return is greater than the rate you identified as your opportunity cost. The more positive it is in relation to the initial investment, the more inclined you'll be to look favorably on this investment. Your result here is not stellar, but it is at least positive.

If the NPV is negative, the property returns at a rate that is less than your opportunity cost, so you should probably reject this investment and put your money elsewhere.

That's all fine, to the extent that you're confident about that discount rate, your opportunity rate. You estimated 10% in the example above. What if you adjust that estimate by one-half of one percent either way?

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$$\text{NPV @ 9.5\%} = 10,284$$

$$\text{NPV @ 10.0\%} = 3,948$$

$$\text{NPV @ 10.5\%} = (2,224)$$

How about one full percent?

$$\text{NPV @ 9.0\%} = 16,789$$

$$\text{NPV @ 10.0\%} = 3,948$$

$$\text{NPV @ 11.0\%} = (8,238)$$

Clearly, the NPV here is very sensitive to changes in the discount rate. If you revise your thinking just slightly about the appropriate discount rate, then the conclusion you draw may likewise need to be revised. As little as a half-point difference could change your attitude from luke-warm to hot or cold.

The prudent investor will test a range of reasonable discount rates to get a sense of the range of possible results.

While we're beating up on NPV, let's also note that it doesn't do you much good if your goal is to compare alternative investments. To have some kind of meaningful comparison, you need at least to keep the holding period for both properties the same. But what if one property requires that \$300,000 cash investment, but the alternative investment requires \$400,000?

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PI – Profitability Index

Fortunately, NPV has a cousin that can help you with that problem: Profitability Index. While the NPV is the difference between the Present Value of future cash flows and the amount you invested to acquire them, Profitability Index is the ratio. It doesn't tell you the number of dollars; it tells you how big the return is in proportion to the size of the investment.

So where the NPV in the example above was equal to 303,948 minus 300,000, the Profitability Index looks like this:

$$PI = 303,948 / 300,000$$

$$= 1.013$$

If, quite improbably, you projected exactly the same cash flows from the property that required a 400,000 investment as from the one requiring 300,000, you would expect your Profitability Index to be much worse, and it is:

$$PI = 303,948 / 400,000$$

$$= 0.760$$

A Profitability Index of exactly 1.00 means the same as an NPV of zero. You're looking at two identical amounts, in one case divided by each other so they give a result of 1.00 and in the other case subtracted one from the other, equaling zero.

An Index greater than 1.00 is a good thing: The investment is expected to be profitable. An Index less than 1.00 is a loser. When you compare two investments, you expect the one with the greater Index to show the greater profit.

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IRR – Internal Rate of Return

Internal Rate of Return (IRR) seems to befuddle many investors, but if you understand Discounted Cash Flow and Net Present Value as discussed above, then you already understand IRR. That's because it is really the same process, but one where you are solving for a different unknown.

In DCF, you believe you know what the future cash flows will be, and you believe you know the rate at which those cash flows should be discounted. Your mission is to figure the Present Value of the cash flows.

With IRR, you still believe you know what the future cash flows will be, but now you know the Present Value and want to find the discount rate. How is it that you know the Present Value? This is a deal happening in the real world. The PV is the amount of cash you are paying for those future cash flows.

When you solve for the IRR, you are looking for the discount rate that accurately describes the relationship between those future cash flows and the money you put on the table on Day One.

When you've found the discount rate that makes the PVs of the future cash flows equal to your initial investment, you've found the IRR. You can express this another way: When you've found the discount rate that makes the NPV equal zero, you've found the IRR.

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Admittedly, the math to find the IRR is ugly, but if you're reading this then you surely must have a computer, tablet, or smartphone (or a highly sensitive gold filling that also picks up the BBC on the Internet); there are plenty of tools, including our own [RealData software](#) that will do the job for you. Easiest of all, here is a [free Excel template](#) that will do the job for you.

IRR is the measurement of choice for many investors because it take into account both the timing and the magnitude of your cash flows. Consider this example:

You still have that \$300,000 to invest, and you can invest it in the property you saw in the first example, yielding these cash flows and IRR:

Year 0 Initial Investment:	(300,000)
Year 1 Cash Flow:	10,000
Year 2 Cash Flow:	20,000
Year 3 Cash Flow:	25,000
Year 4 Cash Flow:	30,000
Year 5 Cash Flow:	385,000 (includes the proceeds of sale)

IRR = 10.32%

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Or you can acquire this property instead:

Year 0 Initial Investment:	(300,000)
Year 1 Cash Flow:	80,000
Year 2 Cash Flow:	50,000
Year 3 Cash Flow:	30,000
Year 4 Cash Flow:	10,000
Year 5 Cash Flow:	300,000 (includes the proceeds of sale)

IRR = 12.97%

If you add up the cash inflows and outflows for both properties, you will find that each has \$300,000 going out in Year 0, and a total of \$470,000 coming in over the next five years. However, the second property shows a significantly higher IRR. Both properties have the same total number of dollars going out and coming in over five years, but the second property shows a greater return on investment. Why?

Because IRR is indeed sensitive to both the timing and amount of cash flow. The first property has a big payday, but you have to wait five years to get the money. In the meantime, annual cash flows are relatively modest.

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In the sale year the second property returns combined cash from operation and resale that is only as much as you originally invested to acquire the property. However, the intervening cash flows are much larger, especially the earlier ones. The early cash flows are especially valuable because you don't have to wait long to receive them and therefore you don't have to discount their values so greatly.

You can probably see why IRR is the metric of choice for many investors. It is indeed sensitive to both the timing and the magnitude of the cash flows, and can often give you a revealing insight into how your cash investment might perform. That can be especially important information when you're comparing several different properties, trying to decide which potential income stream represents the best return over the long haul.

These five metrics -- DCF, PV, NPV, PI, and IRR -- are essential to your success as an income property investor. But are these all you need to know? Is there more to being a successful investor?

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Are you ready to learn more?

Are you comfortable choosing which property to buy, how much to pay? It's vital for you to understand how seasoned investors look at properties in order to separate the winners from the losers.

You have too much at stake to leave your choices to chance. Now you can get a comprehensive, online video education from an Ivy League prof with more than 40 years experience in the field. Click below to find out more.

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